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EXAMINATION OF INDIGENOUS STORAGE METHODS OF COWPEA (*Vigna Unguiculata*) IN MUBI SOUTH LOCAL GOVERNMENT AREA, ADAMAWA STATE, NIGERIA

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Abstract

The study examined the various indigenous cowpea (Vigna Unguiculata V. Walp) storage opportunities and their effectiveness in Mubi South Local Government Area of Adamawa State, Nigeria. Structured interview scheduled were used to obtain information from 70 respondents selected through simple random sampling techniques. Generated data were analyzed using descriptive statistics and (frequency and percentage), and inferential (Chi-square) statistics. The results revealed that (65.7%) of the respondents were males with (75.2%) below the age of 51years. Married respondents accounted for (54.3%) while (64.3%) had one form of education or the other. Majority of the respondents representing (74.3%) were household heads. Eight indigenous storage methods were identified and the use of air tight container, neem leaves/ oil and finger pepper were found to be more effective. Chi-square test results revealed that, the coefficient for age, marital status, farming experience were significantly related to indigenous storage method of cowpea, age $X^2=0.780, P=0.377$, marital status $X^2=1.739$, $P=0.628$ and educational level $X^2=3.977$, $P=0.409$ respectively. Inadequate storage facilities, capital intensive, time consuming, labor intensive and weather conditions were the major constraints faced by the respondents. It is recommended that stakeholders should encourage researches in the areas of promoting indigenous knowledge system, safety, their potentiality and sustainability so as to improve and promote their application since it is cheaper and accessible to the people.

Key words: *indigenous knowledge system, cowpea, storage methods*

INTRODUCTION

Traditional knowledge system (TKS is referred to as knowledge that is unique to a given culture or society and use as a basis for local level decision making in agriculture, health care, food preparation, preservation, education, natural – resources management and a host of other activities [6]. These knowledge systems are sometimes called indigenous practice, local knowledge, indigenous technologies, rural knowledge, indigenous control system as well as ethno-science or people's science [15]. The practices are linked to the communities that produce them and to some extent to their neighbours.

A traditional storage practice of beans is a systematic knowledge of individual farmers that is inherited from their fore-fathers in their locality which they applied to their products for storage purposes. This practice is considered and seen to be affordable due to its low cost and accessibility to practice. Cowpea (Vigna Unguiculata V. *Walp*) is an indigenous African annual legume crop which is also called Southern pea, Black eye pea, Crowder pea, Labia, Niebe, Couple or Frijole [12].The cowpea grains contain about 23% protein and 57% carbohydrate, while the leaves contain between 27and 34% proteins. The leaves and grain are also supplied as high protein feed and fodder to livestock [16].

Cowpea is an important staple food in West Africa and it is largely produced for domestic consumption. It is an absolute source of protein and thus capable of providing solution to the protein-carbohydrate imbalance of the nutrition of Nigerians [1]. It is also an income earner, industrial raw material and having the capacity to improve soil fertility).

Cowpea is grown in lowlands, mid altitude, low rainfall and poor soil. (Particularly in the dry savannah) sometimes as a sole crop or in mixed with cereals. The nutritional value of cowpea plants parts varies greatly depending on the variety [17]. These makes it a poor man source of protein therefore there is great need to store the grain so as to have it all year round, [8]. Production of cowpea is expanding in Nigeria although is concentrated in the northern part (Sudan Zone). Nigeria is a major producer of cowpea in the world. The increasing demand for the commodity has led to more of its cultivation in many parts of the country. Therefore, the use of improved varieties, technologies such as agro-chemicals, seeds and evolving cost effective and sustainable indigenous technologies have also encouraged farmers into cowpea production in recent years for expected yield increase and consequently economic gains. Cowpea is produced virtually in all parts of Nigeria. It is grown as a cash crop besides its value as food crop and, farmers are more into its production in the study area especially with the introduction of promising varieties and application of various and available indigenous technologies. More than 5.4 million tons of dried cowpeas are produced worldwide, with Africa producing nearly 5.2 million. Nigeria, the largest producer and consumer, accounts for 61% of the production in Africa and 58% worldwide [10].

There are several traditional methods of cowpea protection and preservation technologies being practiced by the respondents both at the farm level and storage places to protect the crops against insects infestation which is one of the most important problem against cowpea production and storage. These include regular and early harvesting of mature cowpea pods to minimize the initial infestation, separation of damaged and infested from healthy pods and grain, storage of grains in well-sealed and carefully cleaned granaries. In addition, grains are often mixed with (different plant extracts, salt or bark) several plants solutions such as the neem oil extract (*Azadirachta indica*) among others.

Several measures have been initiated by the Nigerian Government to address some of the problems responsible for food crop losses. For instance, several silos were rehabilitated with new ones established across the geopolitical zones, with a combined storage capacity of over about 1.5 million metric tonnes for the storage of assorted grains; beans and "garri" (cassava by-products), [13]. In spite of these efforts, post-harvest food losses are still substantial and food imports bills have been rising in order to meet the shortfall in food availability. This force the farmers / marketers to look for alternatives or supplement the use of the available technologies for sustainable and cost effective products preservation to minimize losses associated with various infestation effects.

In Nigeria, Storage pest cause direct and indirect damages to stored agricultural products. Direct damages are in the form of weight loss, loss in grade of grains, lowering of harvests' market value, contamination and damage to storage structures. Indirect damages on crops include heating and moisture migration in silos and other storage structures like the traditional African silo: 'rhumbu' and cribs. Other indirect damages include the spreading of moulds and spores throughout the grain mass and monetary expenses in terms of having to purchase pest control chemicals. Damage and losses to stored grain, especially cowpea by insect pests is very severe. About 4 percent of total annual production of cowpea or about 30,000 tonnes valued over 30 million US dollars is lost annually to the cowpea brunched in Nigeria alone [8].

Some attempts have been made to study the effect of cowpea storage in Nigeria [8]. However, there has not been any empirical study into the indigenous cowpea storage methods in the study area. This study was therefore, conducted to provide empirical information on indigenous cowpea storage methods employ by farmers in Mubi- south Local Government Area of Adamawa State. The study was carried out to address the following research questions. What are the socio-economic characteristics of the respondents? what are the indigenous storage methods of cowpea practiced by the respondents what are the perceived effects of the storage methods ? what are the effects of the socio-economic characteristics on the use of traditional Storage Methods of Cowpea? and what are the constraints faced by the respondents in the study area?

Objectives of the study. The main was to assess the indigenous storage methods of cowpea employed by the respondents in Mubi-south Local Government Area of Adamawa State. The specific objectives of the study were to:

(i)describe the socio-economic characteristic of the respondents;

(ii)identify the indigenous storage method of cowpea practiced by the respondents;

(iii)examine the perceived effects of the indigenous storage methods of cowpea;

(iv)determine the effect of socio-economic characteristics on the use of traditional storage methods of cowpea, and

(v)identify the constraints faced by respondents in adaptation of indigenous storage methods of cowpea.

MATERIALS AND METHODS

The study was conducted in Mubi South local Government Area of Adamawa state, Nigeria. Mubi South is located between latitude 11^0 5’N and longitude 13^0 1’E. It has altitude of 696 meters above sea level with annual rainfall of 1,220mm and mean temperature of 15.2^0C during Hamattan period from November to February and 39.7^0C in April [4]. The area has a land mass of 1,261.24km^2 and population density of 187.2 per square kilometres [14].The dry season begins in November and terminates in early June of the following year. The major occupations of the people in the area are farming, trading and civil service. The climate and the rich alluvial soil of the area favours the cultivation of food crops such as sorghum, millet, maize, rice and cassava. It also favours the production of local cash crops such as cowpea, groundnut, sesame and sugar cane on a large scale basis. Livestock production is also very important in the study area and is one of the largest concentrations of cattle in Adamawa state. Fishing is a common practice among those living around riverbank.

Sampling procedure

The data for the study was obtained through both primary and secondary source. Primary data was obtained through the administration of structured questionnaires.

Simple random sampling techniques were employed to select the respondents of the study. To ensure effective coverage of the study area, respondents were randomly selected from each of the districts that constituted the study area. 70 respondents were drawn from the list of the 210 cowpea farmers obtained from the Adamawa State Agricultural Development Program [3] proportionate to the registered cowpea farmers in the districts.

Data Collection and Analysis

Percentages and frequency were used to analyse the socio-economic characteristic of the farmers, percentages was used to determine the perception of farmers on the effectiveness of Traditional Knowledge System of cowpea storage and Constraints. While Chi-square test was used to determine the relationship between the socio-economic characteristics of the respondents and indigenous storage methods of cowpea.

RESULTS AND DISCUSSIONS

Respondents' socio-economic characteristics

The result of the socio-economic analysis as presented in Table 1 shows that majority of the respondents (65.7%) were male while the females accounted for the remaining 34.3% in the study are. This implies that gender is a significant factor in agriculture because of its vital role in determining farming activities in the study area. This could influence the adaptive capacity to employ various indigenous cowpea storage methods. In addition, majority (71.4%) of the respondents were less than 50 years, and only 28.6% were over 50 years. This implies that most of the respondents are young and energetic. Therefore labor intensive methods of cowpea storage could also be employed with less stress.

On the level of education, the result shows in Table 1 that most (54.3%) are married while 45.7% are either single, separated, divorce or widowed. This implies that the farmers need to ensure proper storage of these products to meet the demand of the family. This could influence the adaptive of various method to cater for the family. The result shows that majority of the respondents have a household size of between 6 and 10 and this accounted for about 44.3%. This implies that methods that will demand the use of many hand could easily be apprehended. On the education attained shows that, 52% of the respondents attended primary school while 32% and 16% had secondary and tertiary education respectively. This implies that majority of the respondents are literate.

Table 1. Socio-economic Characteristics of the Respondents

Variable	Frequency	Percentage
Age (Years)		
Less than 40	32	45.7
41- 50	18	25.7
51 above	20	28.6
Total	**70**	**100**
Gender		
Male	46	65.7
Female	24	34.3
Total	**70**	**100**
Marital Status		
Married	38	54.3
Single	6	8.6
Divorced	19	20
Widowed	7	10
Total	**70**	**100**
Household Size		
Less than 5	29	41.4
6-10	31	44.3
11-15	10	14.3
Total	**70**	**100**
Years of Experience		
Less than 5	13	18.6
6 – 10	9	12.8
11 – 15	17	24.3
16 – 20	16	22.8
More than 20	15	21.5
Educational Level		
Primary school	13	52.0
Secondary	8	32.0
Tertiary	4	16.0
Total	**88**	**100**

Source: Field survey, 2016

Table 1 further expressed that 82.9% of the respondents takes farming activities as their primarily occupation and as a means of their livelihood.

Traditional Methods of Cow Pea Storage

Table 2 captured the different methods of cowpea storage by the respondents in the study. Multiple responses were observed among the respondents. The results shows that majority of the respondents considered airtight method as their preferred approach and this accounted for 62.8% of the respondents with 21.4% using liming method as a means of their storage method. Similarly, those respondents practicing house roof and application of neem extract solution accounted for 25.7% and 50% of the respondents respectively. Application of common salts, wood ash and the preservation using finger pepper as their preferred and effective methods of traditional storage of cowpea accounted for 7.1%, 28.6, and 25.7% respectively while 21.4% of the respondents reveals frying methods as the best approach to cowpea preservation in the study area. The study implies that the respondents might be ready to use other alternatives measures to overcome the problems associated cowpea storage if opportunities are made available (affordability) this could attribute to the impact of storage in the study area.

Table 2. Distribution based on various Traditional Methods used by the respondents

Storage methods	Frequency	Percentage (%)
Air Tight	44	62.8
Lime	15	21.4
Roof House	18	25.7
Neem Extract	35	50.0
Common Salt	5	7.1
Use of Ash	20	28.6
Finger Pepper	18	25.7
Frying	15	21.4

Source*:* Field survey, 2016

Perceived Effectiveness of Traditional Storage Method of Cow Pea Storage

Table 3 presents the effectiveness of indigenous storage methods of cowpea as perceived by the respondents. About 20.0% of the respondents expressed the use of air tight container as effective in storing cowpea. This may be due to insufficient air in the container and high temperature that will make insects pests not to survive. Use of Neem leaves and oil extract from neem seed are also reported to be effective by 35.7% of the respondents. Neem leaves / oil extract are very bitter, this could be reason why insect pests do not survive when stored with it. Frying cowpea before storage was as well reported to be effective by 28.8% of the respondents. Though the respondents revealed that, the method is tedious and time consuming. The use of finger pepper for cowpea before storing is also reported to be effective by 50.0% of the respondents. Though the respondents revealed that, the method is tedious and time consuming. This make insect pest not to survive because of the gaseous emissions of irritants that makes the condition unfavorable for the pest to thrive. This implies that if extension services will be intensified in rural areas farmers will improve on their cow pea storage methods. This could be due to the effect of the services to impact on the storage methods.

Table 3. Perceived Effectiveness of Traditional Storage method

Storage Method	Very Effective	Effective	Not Effective
Air Tight	44(62.9)	14(20.0)	12(17.1)
Lime	15(21.4)	45(64.3)	10(14.8)
House roof	23(32.8)	30(42.8)	17(24.3)
Neem Leaves or oil	30(42.8)	25(35.7)	15(21.4)
Common salt	15(21.4)	35(50.0)	20(28.8)
Use of ash	15(21.4)	40(57.1)	15(2.4)
Finger pepper	21(30.0)	35(50.0)	14(20.0)
Frying	15(21.4)	20(28.8)	35(50.0)

Source*:* Field survey, 2016

Effect of Socio-Economic Characteristics on Indigenous Cowpea Storage Methods

Table 4 shows that there was a significant relationship between respondents age, marital status and educational level; X^2 = 0.780, P=0.377, X^2 =1.739, P=0.628 and X^2 = 3.977, P=0.409 with the use of traditional method of cowpea storage. Age of the farmer affects the farmer's knowledge and awareness on the traditional methods of storage. This indicates that the age influence the farmers capability to adopt traditional storage method. The finding supports that of [5]. Marital status is an important factor that determine the adoption of traditional methods of cowpea storage this could be due to the fact that the farmers have family to cater for. Educational level plays an important role in the adoption of technologies. This result is in agreement with the findings of [5] who also placed much emphasis on education as a major determinant of adoption of new technologies.

Table 4. Chi-square Test between socioeconomic characteristics and Traditional Methods of Cow Pea Storage

Variables	Df	X^2 = value	P – value
Age	1	0.780	0.377
Marital Status	3	1.739	0.628
Educational level	4	3.977	0.409
Total	10	100	

Source*:* Field survey, 2016

Constraints to Utilization of Traditional Storage Methods

The result of the various constraints to utilization of traditional storage methods as identified and reported by the respondents are presented in Table 5. The analysis revealed that 25.8% of the respondents complained of inadequate storage facilities as their main constraints. This implies that there is no adequate facilities provided for the purpose of cowpea storage. The study also discovered materials normally being used for this purpose are difficult to get as the process of preparing it is capital intensive especially if large quantity of the product is to be stored. About 18.6% of the respondents revealed that use of indigenous methods are time consuming. Though, it has the advantage of being cheap and safe to health. This also revealed that 24.0% of the respondents complained on the labour intensiveness especially if the cowpea to be stored is in large quantity and their inability to have the resources of hiring labour during the storage process. This implies that obtaining labour during the storage process is a big problem [7]. The result also shows that 11.8% of the respondents complained about the weather condition during the cowpea storage. This implies that weather condition greatly determine the storage process. This could be improved by proving ways in such a way that the weather conditions could be controlled.

Table 5. Constraints to Utilization of Traditional Storage Methods

Constraints	Frequency	Percentage (%)
Inadequate storage facilities	58	25.8
Capital intensive	52	19.8
Time consuming	49	18.6
Labour intensive	63	24.0
Weather condition	31	11.8
Total	**263***	**100**

Source*:* Field Survey, 2016

CONCLUSIONS

The study revealed that majority of the respondents are well experienced in cowpea storage using traditional methods available in the area. The methods were found to be associated with series of constraints, such as weather situation during drying, in adequate storage facilities, beans pest infestation among others. The farmers prefer using this method because of its cheapness, easy accessibility and no or low cost associated with it. It is therefore recommended that:

(i)The farmers should be encouraged and given adequate capacity building in the areas of safety, environmental effect, sustainability, improvement in the technologies and quality control. Further studies need to be carried out to ensure its reliability, effectiveness and acceptability by others.

(ii)Future empowerment initiatives should take into cognizance the storage facilities constraints of rural people to reduce the amount of glut spoilage.

(iii)Similar traditional cowpea storage method should be included in various governmnegt and NGOs projects in the future to encourage safety in our storage system to minimize health associated problems.

(iv)Timely and sufficient provisions of storage facilities will facilitate the achievement of objectives of any farmer. Therefore, delays emanating from the government and donor agencies should be minimized.

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GRAPE SEED *(VITIS VINIFERA L.)* ALLEVIATE REPRODUCTIVE TOXICITY CAUSED BY LINDANE IN NEW ZEELAND WHITE MALE RABBITS

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Abstract

Natural dietary antioxidants are important for their ability to protect cells from miscellaneous damage. Grape seed (GS) (Vitis vinifera L., Vitacease) is a potent natural antioxidant. The present study aimed to investigate the protective effect of GS against the possible testicular dysfunction caused by Lindane in male rabbits. Eighty sexually mature NZW male rabbits (average BW: 2.150±0.50 kg) were equally divided into four groups, the first served as negative control, the second received Lindane (L) (4 mg/kg body weight 1/ 50 LD 50), the third was supplemented with GS powder (50 g/kg diet), and the fourth received both Lindane and GS (LGS). Doses were given once daily via gavage for 90 consecutive days. The results revealed that, L group induced significant decrease in final body weight, sex organs relative weight, sperm concentration, motility and viability, serum testosterone concentration. Moreover, L altered the histological structure of the testis. Supplementation with GS ameliorated the harmful effects of L, this was also proved histopathologically by the noticeable improvement in the testis tissues. It may be concluded that GS may be promising as a natural therapeutic agent in Lindane -induced reproductive toxicity and oxidative stress in the male rabbit testes.

Key words: *Lindane, grape seed, growth performance, semen characteristics*

INTRODUCTION

Chemicals that induce effects by perturbing endocrine systems or mimicking endocrine mediators are collectively described as endocrine disrupting compounds (EDCs). Although pollutants can be very different, chemically and mechanistically, it is appropriate to consider all of the organic and inorganic pollutant classes together and to loosely define them as EDCs because all are known to have disruptive capabilities and they have the potential to interact, additively (Hotchkiss *et al*., 2008) [24]. Lindane, Hexachlorocyclohexane (HCH), an organochlorine pesticide, impairs testicular functions and fertility, has direct action on reproduction and also carcinogenic properties. Lindane enters the food chain resulting in bioaccumulation in the following order in various tissues: fat, brain, testis, kidney, muscle, lung, heart, spleen, liver and blood (Girima *et al.,* 2011) [20]. Lindane can enter the food chain and lipophylicity facilitates its accumulation in the various tissues of living organisms where, after absorption and distribution, it can easily reach the essential tissues of the reproductive system. Lindane can affect the male reproductive system at either one or multiple sites. These sites include testes, the accessory sex glands, and the central nervous system, including the neuroendocrine system (Moline *et al.*, 2000) [35]. Lindane may directly damage spermatozoa, alter Sertoli cell or Leydig cell function, or disrupt the endocrine function in any stage of hormonal regulation (hormone synthesis, release, storage, transport, and clearance; receptor recognition and binding; thyroid function; and the central nervous system). These mechanisms are described with respect to the effects of insecticides exposure in vitro and in vivo (Saradha *et al.*, 2008) [48]. Grape, one of the world's largest fruit crops, with more than 60 million tons harvested per year, is cultivated mainly as *Vitis vinifera* for wine production. Grape (*Vitis vinifera*) seeds are considered as rich sources of poly-phenolic compounds that show antioxidant or antimicrobial effects (Chedea *et al.*, 2011) [11]. The antioxidant potential of grape seed extract (GSE) is twenty and fifty fold greater than those of vitamins E and C, respectively (Shi *et al.*, 2003) [53].

Therefore, the objective of this work was to investigate the protective effect of GS against the possible testicular dysfunction caused by Lindane in male rabbits.

MATERIALS AND METHODS

The present experiment was carried out at Nuobaria Station, APRI, Agriculture Research Center and Livestock Research Department, Arid Lands Cultivation Research Institute, City of Scientific Research and Technological Applications, New Borg El-Arab, Alexandria, Egypt. Eighty NZW male rabbits aged three months with an average initial body weight of 2.150±0.50 kg were randomly divided into four homogeneous groups with four replicates of 5 animals each (20 rabbits per treatment). Four dietary treatments were formulated as follows: the 1st group was used as control (animals were given orally corn oil); the 2nd group was challenged with 1/50 LD50 of Lindane (L) (Aldrich Chemical Company, Inc. 1001 West Saint Paul Avenue. Milwaukee, Wisconsin 53233 USA), (equal to 4 mg/kg body weight); the 3rd group was given GS (*Vitis vinifera*) (50 g/kg diet); while 4th group supplemented with both chemicals (LGS) (4 mg lindane/kg body weight + 50 g GS/kg diet). Lindane was given orally every day by gelatin capsules, while GS powder was added to the diet during the experimental period for 18 weeks. The proximate chemical compositions of carob pods, the experimental diets and the ingredients used in formulating these diets were determined according to the AOAC (2005) [3]and shown in Table 1.

Table 1.Feed ingredients and chemical composition of experimental diet

Ingredients	g/kg
Barley	220
Soybean meal 44%	200
Wheat Bran	150
Clover Hay	300
Yellow corn	70
Molasses	30
Calcium carbonate	5
Di-calcium phosphate	15
Salt (NaCl)	5
Premix *	3
DL-Methionine	2
Chemical composition (as DM basis g/kg)	
Dry Matter	897.2
Organic Matter	934.8
Crude Protein	174.7
Crude Fiber	137.3
Ether Extract	32.2
Nitrogen Free Extract	590.6
Ash	65.2
DE (Kcal/Kg)**	3,001.01

**Each 3 kilograms of premix contains Vit. A 12000000 IU; Vit. D_3 2000000 IU; Vit. E 10000 mg; Vit K_3 2000 mg; Vit.B_1 1000 mg; Vit. B_2 5000 mg; Vit. B_6 1500 mg; Vit B_{12} 10 mg; Biotin 50 mg; Coline Chloride 250000 mg; Pantothenic acid 10000 mg; Nicotinic acid 30000 mg; Folic acid 1000 mg; Manganese 60000 mg; Zinc 50000 mg; Iron 30000 mg; Copper 10000 mg: Iodine 1000 mg; Selenium 100 mg; Cobalt 100 mg; $CaCO_3$ 3000 mg.*

**DE (Kcal/kg) = 4151-(122*Ash)-(64*Fibre)+(38*Fat)+(23*CP)

All rabbits were housed in double flat galvanized wire batteries (40×50×40 cm) and were kept under the same managerial, hygiene and environmental conditions. Dry matter intake and live BW were recorded weekly on a per cage basis, and feed efficiency was then calculated. Dead rabbits were collected daily and recorded as it occurred.

Semen characteristics

Semen was collected once a week from all animals after 13 weeks of treatment and continued until week 18. Ejaculates were obtained using a teaser doe and an artificial vagina. The volume of each ejaculate was recorded (using a graduated collection tube) after the removal of the gel mass. Determination of seminal initial fructose was carried out directly after collection according to Mann (1948) [31]. Assessments of live, dead and abnormal spermatozoa were performed using an eosin-nigrosine blue staining mixture (Shaffer and Alimquist, 1948) [52]. A weak eosin solution which is described by Smith and Mayer (1955) [54] was used for evaluation of sperm concentration by the improved Neubauer hemocyometer slide. Total sperm output was calculated by multiplying semen volume by semen concentration. Two parameters were calculated to evaluate sperm motility index (SMI): percentage of motile sperm and quality of motility (motility grade). The percentages of motile sperm and motility grade were estimated by visual examination under a microscope (X 10^{10}). Motility was classified as follows: 0 = no movement; grade 1 = twitching, no forward progressive movement (fpm); grade 2 = slow fpm; grade 3 = good fpm; and grade 4 = fast fpm. For calculation of the final test scores, the two motility parameters were combined to yield a sperm motility index (Yousef *et al*, 1996) [60]:

SMI = percentage motile × motility grade

Total number of motile sperm was calculated by multiplying percentage of motile sperm and total sperm outputs.

Serum testosterone determination was performed according to the method adopted by Jaffe and Behrman (1974) [26], by using the coat-A-count technique (radioimmunoassay). Serum triiodothyronine (T3) and thyroxine (T4) levels were determined by using immulite kits (USA) with modifications described by Wells *et al.* (2003) [59]for T3 and Richards *et al.* (1999) [44]for T4.

Carcass traits

At the end of the fattening period, five rabbits were chosen randomly from each treatment; the assigned rabbits were fasted for 16 hours, and dissected after individually weighing. The carcasses were then weighed (without head, heart, spleen, lungs, liver, kidneys and testes) to determine the dressing weight. Liver, kidney and testes as well as dressing weight were expressed relative to live body weight. The whole carcass of each animal was finely ground and all samples were weighed before and after drying overnight at 105 °C. Differences between the two weights represent the moisture content. The dried parts ground well, and the obtained samples were analyzed for protein, fat and ash according to AOAC. (2005) [3].

Statistical analysis

Data were subjected to analyze of variance using GLM procedure of SAS software program package (SAS, 2002) [49]. All percentages were first transformed to arcsine being analyzed to approximate normal distribution before ANOVA according to Steel and Torrie (1981) [55]. Statistical significance of the difference in values of control and treated animals was calculated by F test at 5% significance level.

RESULTS AND DISCUSSIONS

Body weight and feed efficiency

Rabbits were observed for 3-4 hours after the administration of L during the experimental period. It was observed that animals temporarily stopped eating food provided to them after the administration of L. Few clinical symptoms like fatigue, silent, tremor, convulsion, dizziness, occasionally diarrheas, dragging their hind limbs, nasal dripping and trembling were noted in rabbits after oral doses of test chemical. The same findings like trembling, decreased movement, diarrheas were observed in the animals exposed to pesticides in a previous study (Najafi *et al.*, 2010) [39]. The changes in body weight throughout the experimental period are summarized in Table 2.

Data showed that treatment with L caused a significant decrease in final live body weight ($P<0.05$), daily weight gain (DWG) ($P<0.05$)

and daily dry matter intake (DMI) ($P<0.05$) than other groups. However, feed efficiency (FE) was significant ($P<0.05$) increased due to treatment with L. The results are in agreement with previous studies by Ball and Chabra (1981) [7] suggested that the decline in body weight gain of different species exposed to pesticides may be due to malabsorption of nutrients from the gastrointestinal tract or due to impaired food conversion efficiency in the treated animals.

Table 2.Growth performance of NZW male rabbits treated with Lindane, grape seed, or the combination of both (mean ± SE)

Parameters	Groups				*P* value
	Control	L	GS	LGS	
Initial body weight (kg)	2.155±0.37	2.160±0.81	2.145±0.64	2.140±0.77	0.6584
Final body weight (kg)	3.620±0.28 ^{a}	2.900±0.32 ^{c}	3.740±0.51 ^{a}	3.250±0.18 ^{b}	0.0029
Live weight gain (g/d)	21.28±0.26 ^{a}	11.17±0.61 ^{c}	21.43±0.42 ^{a}	15.31±0.64 ^{b}	0.0007
Dry matter intake (g/d)	127.16±9.38^{a}	101.69±9.22^{c}	122.81±10.82 ^{a}	110.43±5.01^{b}	0.0022
Feed efficiency	5.98±0.36 ^{c}	9.10±0.22 ^{a}	5.73±0.19 ^{c}	7.21±0.27 ^{b}	0.0036
Mortality %	0	20	0	5	

^{abc} Means with different superscript within rows are significantly different ($P<0.05$).

Mortality was occurred in four test groups during the experimental period. Exposure to pesticides caused reduction in body weight and induced some health problems in animals like e. g. reproductive disorders (Aly *et al.*, 2009) [2]. Nersesian *et al.* (2012) [40] reported that decreased feed intake is one of the first responses that rats showed when subjected to certain toxic compounds. Hassan *et al.* (2002) [23] suggested that the hazardous effect of L on feed intake may be due to its effect on the central nerves system (CNS), particularly the hypothalamus which includes feed and water intake center. Also, hyperglycemia which was observed in treated animals probably contributed to the loss of appetite. They suggested that rupture of cells and deformation of tissue may affect the functional activity of the digestive enzymes and this may interfere with digestion, resulting in reduced appetite and growth rate. The decrease in feed intake could be explained by less digestible nutrients which could results in less digestion rate and lower out flow of nutrients from the rumen to the small intestine.

Best (2006) [8] reported that feeding grape seed oil improved body weight of pigs. They suggested that plant products rich in polyphenols may be able to influence the microbial population in the intestine of pigs.

On the other hand, grape residue inclusion up to 30 g/kg did not have any negative effects on growth performance of the broilers (Goñi *et al.*, 2007) [21]. Fiesel *et al.* (2014) [19] showed that plant products rich in polyphenols are effective in increasing the gain:feed ratio in growing pigs. Previous studies in rats and broilers have shown that polyphenols are able to cause a shift in the microbial population in the intestinal tract (Viveros *et al.*, 2011) [58]. In a study with broilers feeding grape pomace extract or grape seed extract increased counts of beneficial ileal bacteria populations such as *Enterococcus* and decreased counts of potential pathogens such as *Clostridium* were observed (Viveros *et al.*, 2011) [58].

Carcass characteristics

Relative organs weight.

Pre-slaughter weight, dressing percentage and relative organs weight to live body weight of rabbits fed the L, GS and LGS are presented in Table 3.

Treatment with L alone caused a significant decrease in dressing percentage ($P<0.05$) compared to other groups. Treatment with L alone or LGS caused a significant increase in liver and kidney relative weight ($P<0.05$) compared to control and GS groups (Table 3).

There were no significant differences between control group and GS group in liver, kidney, heart and testes relative weights. The increase in liver and kidney weights in rabbits exposed to L and LGS are in agreement with the results of Elbetieha *et al*. (2001) [15] in rats.

The effect of L, GS and LGS on the carcass chemical composition is presented in Table 3.

Table 3.Carcass weight and meat chemical composition of NZW male rabbit's treated with Lindane, grape seed and the combination of both (mean ± SE)

Parameters	Groups				*P* value
	Control	L	GS	LGS	
Pre slaughter weight, kg	3.200±0.34	2.750±0.48	3.360±0.41	3.090±0.35	0.2554
Dressing (%)	60.26±017^{a}	55.70±0.21^{c}	60.50±0.48^{a}	58.61±0.15^{b}	0.0011
Edible giblets:					
Liver, %	2.34±0.15^{c}	3.29±0.11^{a}	2.41±0.12^{c}	3.06±0.10^{b}	0.0014
Kidney, %	0.72±0.08^{c}	1.13±0.05^{a}	0.78±0.07^{c}	0.99±0.06^{b}	0.0009
Heart, %	0.38±0.02^{b}	0.57±0.03^{a}	0.40±0.03^{b}	0.52±0.05^{a}	0.0043
Testes, %	0.36±0.04^{a}	0.24±0.01^{b}	0.37±0.09^{a}	0.28±0.02^{b}	0.0049
Chemical composition of meat:					
Moisture	69.64±0.31^{c}	72.44±0.22^{a}	69.23±0.18^{c}	70.46±0.33^{b}	0.0008
Crude protein	20.68±0.21^{a}	19.33±0.27^{b}	20.46±0.16^{a}	19.73±0.11^{b}	0.0011
Ether extract	5.33±0.14^{b}	6.05±0.16^{a}	4.96±0.11^{b}	5.88±0.10^{a}	0.0015
Ash	1.45±0.08	1.65±0.10	1.47±0.11	1.73±0.24	0.3365

^{abc} Means with different superscript within rows are significantly different ($P<0.05$).

Data showed that treatment with L and LGS caused a significant increase in moisture and fat content ($P<0.05$) and decrease in CP content compared to the other groups. Gupta *et al*. (1983) [22] reported that the inhibiting effect of pesticide on protein synthesis was dose-dependent. Cecil *et al*. (1974) [10] found that liver's lipid content can increased significantly ($P<0.05$) when female rats and quail were treated with Malathion. The present results do indicate that body composition had been altered by pesticide treatment and resulted in enhanced fat deposition and prevented fat mobilization.

In this study, higher protein and lower lipid levels were found in the body of rabbits fed diet containing GS. The higher protein level of GS group is probably related to the decreased crude lipid levels which the later might be due to GS effects on lipid metabolism. It was found that GS could repress intestinal lipid absorption, chylomicron secretion by the intestine, very low density lipoprotein secretion by the liver (Ngamukote *et al*., 2011) [41], inhibit intestinal lipoprotein secretion (Vidal et al., 2005) [57], inhibit cellular cholesterol uptake and 5-lipoxygenase activity (Leifert and Abeywardena, 2008) [30], and stimulate serum ability to induce efflux of cellular cholesterol (Senault *et al*., 2000) [51]. Tekeli *et al*. (2014) [56] showed that abdominal fat weight tended to decrease in the groups fed 5 and 10 g/kg GS oil. Moreno *et al*. (2003) [37] reported that GS extract limited fat deposition in adipose tissue by inhibition of the fat metabolizing pancreatic enzymes, lipoprotein and hormone-sensitive lipase and hence controlled obesity.

The weights of the testis, epididymis, seminal vesicles and ventral prostate decreased in rats exposed to methoxychlor (Latchoumycandane and Mathur, 2002) [29]. The activities of antioxidant enzymes such as superoxide dismutase, catalase, and glutathione peroxidase decreased in testes. The levels of hydrogen peroxide generation (H_2O_2) and lipid peroxidation increased in testis of the rats after methoxychlor exposure. DDT and some organic solvents lead to decreased fertility and altered sperm counts. The DDT can also delay puberty (Moreira and Wolff, 2003) [36]. The effects of high exposure to Tetrachloro-dibenzo-p-dioxin (TCDD) and "TCDD-like" compounds on important sites for development and reproduction have also been recognized by Eskenazi and Kimmel (1995) [18]. Profenofos exerted toxic effects on testicular tissues and disrupting the testicular function in treated animals which was associated with significant reduction in testes weight (El-Kashoury, 2009) [16].

Semen characteristics

Semen characteristics are important in determining the fertility of rabbit bucks. Non-genetic factors such as stress, nutrition, age and management are believed to influence semen characteristics and subsequently buck fertility. Rabbits quickly adapted themselves to semen collection procedure employed. The majority of the treated animals, especially those treated with combination of L and GS indicated reduced libido. Data on semen ejaculate volume and sperm quality parameters of rabbits treated with L, GS, and the combination of both are presented in Table 4.

Table 4. Semen characteristics of NZW male rabbit treated with Lindane, grape seed and the combination of both (mean + SE)

Parameters	Groups				*P* Value
	Control	L	GS	LGS	
Semen volume (ml)	0.95±0.01 ^{b}	0.67±0.02 ^{d}	1.00±0.02 ^{a}	0.82±0.04 ^{c}	0.0031
Sperm Concentration (X 10 ^{6}/ml)	400.33±12.37^{b}	247.33±15.67^{d}	460.10±23.55^{a}	370.44±25.18^{c}	0.0044
Total sperm output (X 10^{6} sperm)	380.31±22.46^{b}	165.71±19.33^{d}	460.10±18.28^{a}	303.76±31.27^{c}	0.0028
Sperm motility (%)	85.25±0.48^{a}	61.50±0.83^{c}	85.75±0.77^{a}	75.50±1.06^{b}	0.0007
Sperm motility grade	3.88±0.06^{a}	2.44±0.07^{c}	3.79±0.08^{a}	3.05±0.08^{b}	0.0039
Sperm motility index (SMI)	3.31±0.09^{a}	1.50±0.10^{c}	3.25±0.08^{a}	2.30±0.05^{b}	0.0023
Total motile sperm per ejaculate	324.21±11.52^{b}	101.91±14.88^{d}	394.54±9.84^{a}	229.34±12.31^{c}	0.0001
Abnormal sperm (%)	11.41±0.38^{c}	29.25±0.47^{a}	10.77±0.41^{c}	19.35±0.33^{b}	0.0026
Dead sperm (%)	7.33±0.10 ^{c}	18.55±0.24 ^{a}	6.98±0.15 ^{c}	12.66±0.11 ^{b}	0.0024
Semen initial fructose (mg/100ml)	112.66±7.13 ^{c}	261.38±16.83 ^{a}	113.19±8.15 ^{c}	187.92±9.03 ^{b}	0.0019

^{abc} Means with different superscript within rows are significantly different($P<0.05$).

Data showed that treatment with L caused a significant decrease in semen ejaculate volume, sperm concentration, total sperm output, sperm motility, sperm motility grad, sperm motility index (SMI) and total motile sperm per ejaculate ($P<0.05$) compared to other groups. While treatment with L caused a significant increase in percentage of abnormal sperm, dead sperm and semen initial fructose ($P<0.05$) compared to other groups. These results agreed with previous studies showing reduced semen quality in men occupationally exposed to various pesticides. Azoospermia, testicular dysfunction and sterility were also noted in men chronically exposed to dibromochloropropane, DBCP (Balash *et al.*, 1987) [6]. Salem *et al.* (1988) [46] also reported that dimethoate and deltamethrin reduced libido, ejaculate volume, sperm concentration and total epididymal sperm counts and deferens sperm concentration, and caused slight to severe hypospermatogenesis of the male rabbits. Motility is involved in defining the ability of the spermatozoa to ascend the reproductive tract to the site of fertilization, as well as the act of fertilization itself, particularly regarding the penetration of the vestments surrounding the oocyte, including the cumulus oophorus and zona pellucida. Considering the significance of sperm motility, it is not surprising that this criterion of sperm function has assumed a central role in the routine clinical diagnosis of male fertility (Aitken, 1990). This author suggested that pesticide's disruption of reproductive processes might be partly due to adverse effects on sperm cell function. Pesticides had a damaging effect on spermatogenesis and this disturbance was due to the lack of local testosterone. The effects of pesticides on spermatogenesis may be mediated through their effects on hormonal balance. Krause (1977) [27] also reported that Malathion and dichlorvos decreased fertility, spermatogenesis and increased sperm abnormalities in rats, and these effects were attributed to a direct cytotoxic action on the testes. The presented data showed a significant increase in semen initial fructose. The fructose formation by the accessory glands is dependent upon the secretion of testosterone by the testes (Atterwill and Steele, 1987) [4]. Lindane, an organochlorine pesticide, impairs testicular functions and fertility. Lindane has direct action on reproduction and also carcinogenic properties. Treatment with 1-40 mg of L/kg body weight disrupted testicular morphology, decreased spermatogenesis and impaired reproductive performances in males (Page *et al*., 2002) [43].

Sperm motility parameters were increased in this study by supplementing the diet with GP. In addition, GP antioxidants may offer protection against the damaging effect of leukocyte-derived reactive oxygen species on sperm movement (Baker *et al*., 1996) [5]. It could be assumed that the observed increases in sperm motility after the GP treatments could partly be attributed to the concomitant induction in semen fructose (Yousef, *et al*., 2003) [61].The positive effects of dietary GP on both sperm count and sperm motility and the reduced percentage of dead sperm could be linked to the antioxidative properties of GP (Murthy *et al*., 2002) [38]. It had been suggested that the morphology and the motility of sperm cells would be preserved by binding antioxidants to endo-peroxides (Marin-Guzman *et al*., 2000) [32]. Recently, Eid *et al*. (2006) [14] found that a higher antioxidant intake was associated with greater sperm numbers and motility.

Serum hormones

Data in Table 5 demonstrates testosterone, T3 and T4 concentrations in blood plasma. The GS group had significantly greater testosterone, T3 and T4 concentrations (P<0.05) in blood plasma than the other groups. The significant decrease of testosterone level may be a result of direct damage of dicofol on leydig cells, which are the main site of testicular androgen biosynthesis.

Table 5. Serum hormones of NZW male rabbit treated with Lindane, grape seed and their combination (mean ±SE)

Parameters	Groups				*P* values
	Control	L	GS	LGS	
Testosterone (ng/ml)	2.06±0.15 ^{b}	0.76±0.21 ^{d}	3.78±0.18 ^{a}	1.22±0.09 ^{c}	0.0001
T3, ng/ml	5.45±0.16 ^{b}	2.28±0.18 ^{d}	6.49±0.12 ^{a}	3.33±0.14 ^{c}	0.0001
T4, ng/ml	22.82±0.32 ^{b}	10.71±0.41 ^{d}	25.58±0.11 ^{a}	14.11±0.16 ^{c}	0.0001

^{abc} Means with different superscript within rows are significantly different (P<0.05).

Results of the present work agreed with those found by Choudhary and Joshi (2003) [12], who noted that T level was significantly decreased in male rats exposed to organochlorine pesticides at different doses, i.e. DDT, PCB-126 and 153, methoxychlor, DDT, endosulfan. El- Kashoury *et al*. (2003) [17] described similar changes in T4 and T3 levels after dicofol exposure at lower and higherdoses. They also reported that the decrease in T4 levels may be a result of iodine deficiency that causes the gland fail to synthesize T4 and therefore hypothyrodism occurs. Hotz *et al*. (1997) [25] also reported that, pesticide increased deiodination and biliary excretion of thyroid hormone T4 which led to increased rate of T4 elimination from the blood. Some insecticides, herbicides and fungicides disrupt endocrine system. Thyroid disruptors affect through different mechanisms (Boas *et al.*, 2006) [9]. It has been shown that some thyroid disruptors inhibit thyroperoxidase; thereby they change ability of follicular cell in producing T4 and then T3, even at sufficient iodine concentration. Animal studies have revealed that amitrol (herbicide), ethylenethiourea (fungicide), Mancozeb (fungicide); bean isoflavones and benzophenone 2 inhibit production of thyroperoxidase and prevent thyroglobulin synthesis. Therefore, T3 and T4 synthesis is reduced (Miller *et al.*, 2009) [34]. Many chemical compounds have high structural similarity to thyroxin and T3 thereby they disrupt the binding of thyroid hormones to their receptors or transferring proteins. This case can in turn result in subclinical hypothyroidism, which is randomly diagnosed in adults due to its mild symptoms. The results of this study suggested that exposure to organophosphorus and organochlorine pesticides, which are the most widely used pesticides, may changes serum level of thyroid stimulating hormone (TSH), total T4 and total T3 in human in the long-term. In another study, the relationship between urine concentration of dialkyl phosphate and TSH and thyroid hormone levels were examined among farmers (Lacasana *et al.*, 2010) [28].

Histological Parameters

The histological structure of testes in control animals consisted of seminiferous tubules with rounded /oval shaped and spermatocytes were also noted in scattered position throughout the tubules. Sertoli cells were also present inside the seminiferous tubules along with leydig's cells within interstitial space (Zidan, 2009) [62].

In the present study histological structure of testis in the control animals showed normalsize seminiferous tubules containing different types of spermatogenic cells in different stages of spermatogonia and spermatocytes with appearance of normal and narrow interstitial space and leydig's cells of normal size were also present in the interstitial space (Fig. A).

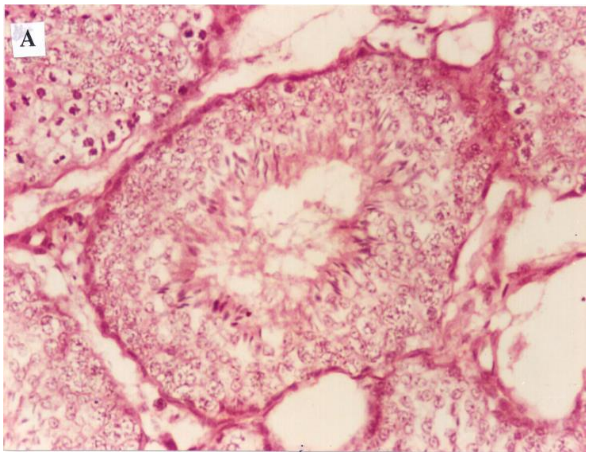

Fig. A. Photomicrograph of testes of control rabbit showing normal semineferous tubules.

However histopathological changes were observed in the animals exposed to L for 90 days. Tumor-like mass was present in few tubules along with other changes like e. g. vacuolation in seminiferous tubules and suppressed number of leydig's cells. The seminiferous tubules were found with abnormal size and shape indicated in (Fig. B).

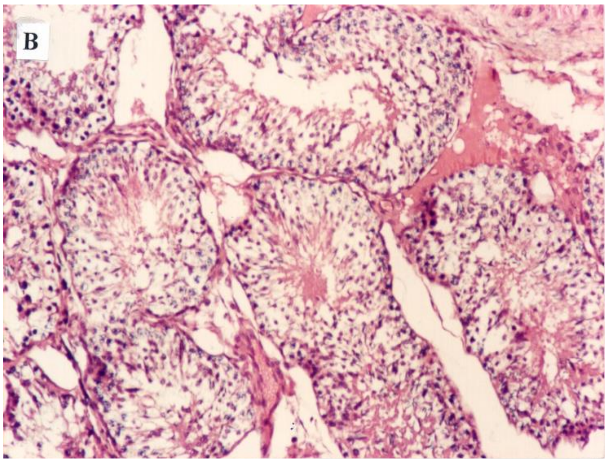

Fig. B. Photomicrograph of testes of rabbit treated with Lindane showing degenerative changes of spermatocytes, edema between some semineferous tubules and anest of spermatogenesis.

Moreover, our investigations revealed that, the size of seminiferous tubules were further reduced as well as condensed interstitial space. The number of spermatogenic cells was regressed and leydig's cells have been either hypertrophied or eliminated. Destruction in leydig's cells, disrupted the functioning of the testes to release testosterone hormone for the development of spermatogenic cells (Saunders, 2003) [50]. In the present study hypertrophyin interstitial spacewas clearly seen and no spermatocytes were found in the seminiferous tubules. The leydig's cells were totally regressed or vanished, that shows drastic endocrine disrupting effects of L on leydig's cells and testes (Fig. B). Exposure of pesticides exhibited pathological changes in testicular tissues and this alteration occurred as antiandrogenic effects (Dallegrave *et al.*, 2007) [13].

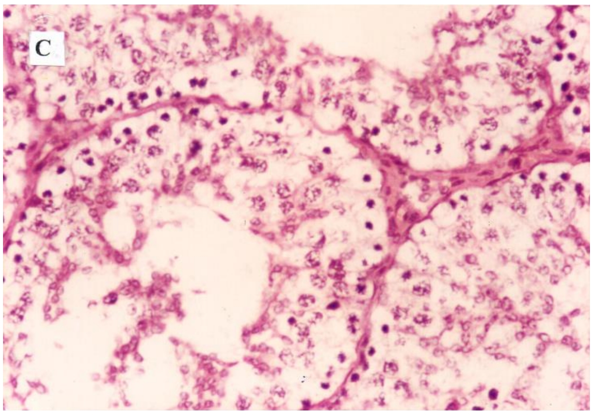

Fig. C. Photomicrograph of testes of rabbit treated with grape seed showing normal semineferous tubules.

The results indicated that the toxicity of L on testes depends on the dose. The changes predominantly consisted of moderate edema, congestion, damage to Sertoli cells and germ cells, along with the accumulation of cellular debris and presence of giant cells in the lumen of a few seminiferous tubules. More recently, several studies have investigated the effect of mixtures of endocrine disrupting compounds (EDCs) on the developing rodent testis and its functions, and have shown that combinations of the compounds e.g. anti-androgenic EDCs, exert major effects at doses at which the individual EDCs have no significant effect (Rider *et al.*, 2009) [45]. In adult Wistar rats orally treated with pirimiphos-methyl (41.67, 62.5 or 125 mg/kg) for 90 days, a decrease in relative testis and epidiydimis weights and intra-testicular cholesterol level were recorded. Whereas a decrease in serum total protein, sperm density and motility, fertility and parturition indices and pups sex-ratio (M/F) were recorded in animals treated with 125 mg/Kg of pirimiphos methyl. Histological findings also indicated enlargement of interstitial space, inhibition of spermatogenesis, rarefaction of Leydig cells and edema in testes of treated rats (Ngoula *et al.*, 2007) [42].

The role of GS in male fertility is very well documented. Supplementation of GS has been reported to restore the spermatogenic process and thus fertility damage by toxic heavy metals (Sallam *et al.* 2005) [47], reduces oxidative stress-related effects on spermatogenesis in Cd-treated swiss mice (Acharya *et al.* 2008) [1].

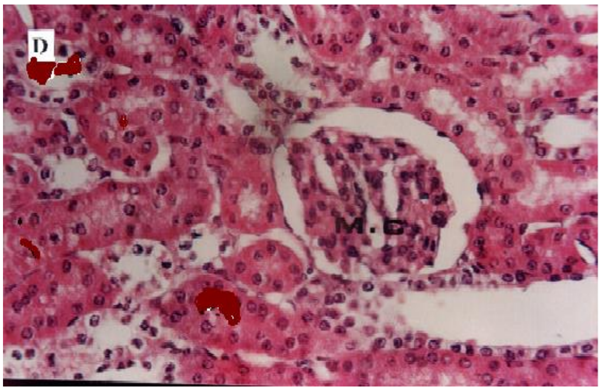

Fig. D. Photomicrograph of testes of rabbit treated with the combination of Lindane and grape seed showing degenerative changes and necrosis semineferous tubules. spermatogenesis

In this study, L induced marked degenerative changes in caput and cauda epididymis and the vas deferens, but these changes were prevented with GS supplementation in combination with L. It has been suggested that the degenerative changes in the epididymis and vas deferens caused a decreased bioavailability and production of androgens (Mennela and Jones 1980) [33]. Thus L may modulate androgen levels in the blood by acting on androgen-producing cells or through the hypothalamo-hypophysial-gonadal axis. Since the epididymal epithelium structure, function and spermatozoa maturation are all androgen-dependent, hence the observed degenerative changes in the epididymis caused by L exposure may be due to low androgen levels in the serum. Recovery of epididymal structure after GS supplementation may indicate the restoration of androgen synthesis. All these observations suggest that L has androgen-antagonistic functions in male Mus musculus. Since administration of GS showed normal histoarchitectural features in the epididymis and vas deferens, this indicates that GS has antioxidative and protective roles against L toxicity.

CONCLUSIONS

The rabbits group whose diet included Lindane registered a decline in the final body weight, sex organs relative weight, sperm concentration, motility and viability, serum testosterone concentration. Also, the diet including Lindane altered the histological structure of the testis.

The inclusion of grape seeds (GS) in the diet ameliorated the harmful effects of Lindane. This was histopathologically demonstrated by the noticeable improvement in the testis tissues.

Therefore, the use of grape seeds in the diet increased the quality of the rabbit semen probably due to the physiological and antioxidant effects.

As a final conclusion, in the male rabbit testes, grape seeds may be a natural therapeutic agent in Lindane-induced reproductive toxicity and oxidative stress.

More detailed studies regarding this particular aspect are required.

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THE EFFECT OF MICROCREDIT ON RURAL HOUSEHOLD LIVELIHOOD: EVIDENCES FROM WOMEN MICRO ENTREPRENEURS IN OYO STATE, NIGERIA

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Abstract

Microcredit has been found to be an intervention to improve the livelihood of women micro entrepreneurs in developing countries. It is often used as an attractive strategy to enhance the livelihoods of women as it provides micro entrepreneurs with the avenue to generate more income. The study focused on the effect of micro credit on rural households' livelihood: evidences from women micro entrepreneurs in Oyo State, Nigeria. A descriptive survey design was adopted and 180 beneficiaries of microcredit were used. The result of the study revealed that microcredit had a positive effect on household income and welfare which led to improvement in the standard of living and opportunity to save money. The women micro entrepreneurs were able to contribute significantly to their children's education improve the quality of meals intake and employment and housing conditions of their households. The microcredit scheme also contributed to beneficiaries' development, sustainability and local governance participation. Above all, the respondents felt empowered. It is therefore concluded that those concerned with availing funds in form of microcredit and microfinance in general should take into consideration the results of these indicator variables for better livelihood of rural households.

Keywords: *livelihoods, micro-credit, micro-entrepreneur, Nigeria, women*

INTRODUCTION

The significant role that microcredit plays in empowering women, delivering new found respect, independence and participation in their communities and in their households cannot be overemphasized [12]. Microcredit has been considered as a veritable tool for development and poverty reduction since its introduction in the mid -1970s [21]. [13] viewed delivery of microcredits to micro entrepreneurs in developing countries as a means of assisting the so-called "working poor". While not forgetting that a sustainable livelihood is essential for a good living, providing the poor with credit will serve as an antidote for solving their problems. In this respect, a microfinance program is seen as a practical and smart method for providing the poor accessibility to credit, hence reducing poverty and achieving sustainable livelihood. Microcredit holds three promises, which include poverty reduction, women empowerment and enhancement of family planning knowledge and practices [20], [10].

Microfinance services have been seen in literatures [12], [6] as a source of women's empowerment by positively enhancing their socio-economic status and influencing women's decision-making power. It was reported that over 79 million of the world's poorest women were reached with microfinance services by the end of 2006. It could then be inferred that microcredit, the lending aspect of microfinance has the likelihood to make a substantial contribution to gender equality, encourage sustainable livelihoods and improved working conditions for women.

Women comprises of seventy percent of the world's poor. They have been deprived traditionally in gaining access to credit and other financial services. Commercial banks often focus on men and formal businesses, neglecting the women who make up a large and growing segment of the informal economy. Women workers throughout the world add to the economic growth and sustainable livelihoods of their families and communities. Women particularly benefit from microfinance as many microfinance institutions (MFIs) target female clients. Evidence from the literature supports the belief that women are part of the missing links in the development dilemma confronting the developing economies where Nigeria belongs. This statement is buttressed by the fact "that they (women) account for over half the food produced in these (developing) countries, consist of one–fourth of the industrial labour force, additionally fetching most of the household's water and fuel wood, and are responsible for children and household chores" [4]. This study addressed the effect of microcredit on household livelihood using data collected on women micro entrepreneurs in Oyo State, Nigeria.

Microcredit is often advocated as a solution to multiple livelihoods problems in Nigeria. Poor women with access to microcredit can make investments in micro enterprises that could bring her family out of poverty. The study was prompted by several benefits which were envisaged will be derived by Government, policy makers, researchers, microcredit lenders, and women led households at large if the effect of microcredit on household livelihood of women micro entrepreneurs is assessed. The study distinguishes itself from previous studies carried out in Nigeria by restricting itself to Oyo State in which microcredit lending abound and identified the fact that women micro entrepreneurs constitute a vital component of household. The findings of this study shed light on the importance of microcredit on household livelihoods and the outcome will enable the Government and policy makers to devise meaningful policies and programmes that will make substantial amount of credit accessible to women and also remove bottlenecks to credit access by women.

MATERIALS AND METHODS

The study was conducted in Oyo state located in the southwest region of Nigeria. The Old Oyo State, as it was then known, was created on 3rd of February, 1976 from the erstwhile Western State. The present Osun State was carved out of it in 1991 to what is now the present Oyo State. Oyo State is populated by a people that are homogenous in terms of language and culture. It is inhabited by the Yoruba ethnic group who are primarily agrarian. Oyo State has its coordinates located between latitude 7^0 and 9^0 30' North of the equator and between longitude 2.5^0 and 5^0 East of the prime meridian. According to [18], Oyo state has a landmass of 28,454 square kilometres and the population of 5,591,589. Oyo State is bounded in the North by Kwara State, in the East by Osun State, in the South by Ogun and in the West by Ogun and Republic of Benin. Oyo state is made up of thirty-three Local Government Areas. The vegetative pattern is of rain forest in the south and guinea savannah in the north which makes the state rich in flora and fauna. This serves as a rich source of raw materials to the small and medium scale enterprises and industries within and outside the state. There is the existence of fifty seven Microfinance banks which offers a complete range of financial services ranging from ₦30,000.00 to ₦1,000,000.00 to micro, small and medium scale enterprises in Oyo state.

This study used the multistage random sampling technique for selecting the representative of women micro entrepreneurs. This entailed random selection of a Local Government Area from each of the three Senatorial district of the state; two (2) rural communities from each Local Government Areas selected; and thirty (30) women micro entrepreneurs in each of the communities. In order to be precise in choosing respondents, the study focused on five working groups, they are weaving, cassava processing, soap making, agricultural trading and small scale farming. A total of 180 were sampled but due to incomplete data only 172 women were used for the analysis. The data were collected with the aid of questionnaire and direct personal interview schedule which was majorly conducted in Yoruba language. The respondents who were consulted through their association for an introduction to their group members were informed of the aim of research. Ethical issues were considered and issues relating to profit and income were cautiously dealt with.

The descriptive survey was employed to conduct this study. The purpose of using this type of survey was that literature has proven that descriptive survey is best for researches that are concerned with the condition or relationship that exists, such as establishing the nature of prevailing conditions, attitudes and practices; processes that are ongoing; opinions that are held; or trends that are developed [7], [9] and [5]. Also [7] and [8] reiterated that research that have the purpose of defining phenomena of diverse kinds, happenings, conditions, courses of events and actions are better handled by descriptive survey.

RESULTS AND DISCUSSIONS

The socio-economic characteristics of respondents illustrated some heterogeneity and variations in the uniqueness of women engaged in income generating activities in the micro enterprise sector in the study sample as shown in Table 1. The age distribution of micro entrepreneur revealed that the modal age range was 31-40 years (39.53%) while the mean age was 38 years. A bulk of the micro entrepreneurs are in their active age (74.25%), a period which entrepreneurs' business activities also coincide with child bearing and childrearing responsibilities. This is in agreement with [19] which stated that most of the micro credit beneficiaries are in their prime age of life which falls in the economic activity rate group and [11] report which stated that on the average, 87% of female entrepreneurs in Bangladesh, Phillipines, Tunisia, Tanzania and Zimbabwe are aged 50 years and below. This may be due to economic hardship being encountered and the need to supplement meager household incomes.

It is reasonable to think that the larger the number of household members, the larger the commitments of the working adult who has the responsibility of taking care of the household. Household size determines the dependency ratio hence is of great importance as an indicator to the sample commitment to their venture. The results in Table 1 showed that the household size of 5-8 formed the majority (60.47%) of the respondents with an average household size of 6. This implies that the respondents had manageable family sizes which may mean their consumption expenditure would not have too much of an adverse effect on their profit margin and / or credit availed while assuring extra family labor in their enterprise.

The marital status of a woman determines the degree of responsibility in the society and the manner in which she will judiciously allocate the resources at her disposal. 85.47% of the sample was married, they have obligations to cater for their households and hence rely on their micro-entrepreneurial activities as vital source of income.

The study revealed that most women micro entrepreneurs were barely literate. Mostly primary level education or some year of secondary school education. This is a fundamental and considerable limitation for white collar employment. The mean years of educational attainment was 5 years as shown in Table 1.

Apprenticeship is common with micro entrepreneurial activities such as hair dressing and tailoring or dress making and sole proprietorships such as petty trading, small-scale retailing, and catering (restaurants). The study had a mean size of 3 apprentices and 52.33% of respondents also have 1-5 apprentices. The apprentices constitute their labor force in addition to unpaid family labor.

Source of credit could have a lot of influence on enterprise since interest rates usually affect the quantum of money available for investment and the profit realised from enterprise. [16] noted that a major barrier to escaping poverty and food insecurity is the lack of sufficient credit to purchase inventory or equipment needed to establish sustainable micro enterprises.

As shown in Table 2, many (40.12%) of the respondents patronized microfinance institutions for their credit needs, while 22.09%, 15.12%, 11.05%, 10.40% and 1.16% patronized cooperative societies, personal savings, relatives and friends, Non

Governmental Agencies and local money lenders respectively.

Table 1. Distribution of Respondents by Socio-economic Characteristics.

Age	**Frequency**	**Percentage**
≤ 30	16	9.30
31-40	68	39.53
41-50	42	24.42
51-60	35	20.35
> 61	11	6.40
Total	172	100.00
Mean	38	
Household Size	**Frequency**	**Percentage**
1-4	21	12.21
5-8	104	60.47
9-12	37	21.51
> 12	10	5.81
Total	172	100.00
Mean	6	
Marital Status	**Frequency**	**Percentage**
Never Married	8	4.65
Married	147	85.47
Divorced	3	1.74
Widowed	14	8.14
Total	172	100.00

Years of Education	**Frequency**	**Percentage**
0	14	8.14
1-6.	78	45.35
7-12.	56	32.56
> 12	24	13.95
Total	172	100.00
Mean	5	
Number of apprentices	**Frequency**	**Percentage**
< 1	47	27.33
1 - 5.	90	52.33
6-10.	33	19.19
>10	2	1.16
Total	172	100.00
Mean	3	

Source: Field Data, 2015.

This distribution revealed that formal and informal credit markets co-existed in the study area. The co-existence of the formal and informal credit market improved access of the respondents to credit.

Size of women's enterprises in terms of capital as shown in Table 2 revealed that the sample studied were micro scale with meagre initial capital. The low start-up costs is one of the determinants of women's involvement and influx into micro and small scale businesses as said by [22], [14], [17] and [1]. It was discovered that majority of the women borrowed between ₦30,000.00 and ₦50,000.00 while the mean microcredit obtained was ₦45,000.00.

To a large extent, the motive of sourcing for micro credit will determine the credit viability and ability to meet repayment demand. In the survey and as shown in Table 2, 36.63% and 29.07% collected the credit primarily to start and expand their micro enterprise relatively.

Table 2. Distribution of Respondents by Micro Credit Characteristics.

Micro Credit Sources	**Frequency**	**Percentage**
Microfinance Institutions	69	40.12
Non Governmental Agencies	18	10.47
Cooperative Societies	38	22.09
Relatives and Friends	19	11.05
Local Money Lenders	2	1.16
Personal Savings	26	15.12
Total	172	100.00
Amount of Microcredit Obtained (₦)	**Frequency**	**Percentage**
≤ 10000	5	2.91
10001-30000	42	24.42
30001-50000	73	42.44
50001-70000	45	26.16
> 70001	7	4.07
Total	172	100.00
Mean	45000	
Purpose of Microfinance Loan	**Credit**	**Percentage**
To start business	63	36.63
To expand business	50	29.07
To service other loans	19	11.05
Household expenditures	22	12.79
Buy a cell phone	5	2.91
Transport	2	1.16
Buy Furniture	1	0.58
Total	172	100.00
Problem encountered in Credit Market	**Frequency**	**Percentage**
Inadequate fund	67	38.95
High Interest Rate	49	28.49
Untimely Delivery	23	13.37
Payback period length	10	5.81
Problem of Guarantor	8	4.65
Bureaucracy	15	8.72
Total	172	100.00
Source of microcredit loan repayment	**Frequency**	**Percentage**
Business earnings	127	73.84
Sale of household assets	7	4.07
Loans from other microcredit institutions	6	3.49
Borrowing from friends and relatives	18	10.47
Remittances from household members	11	6.40
Allowance	3	1.74
Total	172	100.00

Source: Field Data, 2015.

This indicated that majority of the respondents owed their livelihood to the provision of the microcredit without which this large number of persons and their households would not have had any source of livelihood. And they are expected to meet repayment demand from income realized from the enterprise. However, 11.05%, 12.79%, 2.91%, 1.16% and 0.58% collected the loan to service other loans, purchase household expenditures, buy cell phones, transportation and buy furniture respectively. These are for consumption smoothing and the likelihood of meeting repayment is low.

Table 2 presented distribution of the respondents by problems encountered in the credit market. The result showed that the problems ranged from inadequate funds (38.95%), high interest rates (28.49%), untimely credit delivery (13.37%), getting a guarantor (4.65%), payback period length (5.81%) and bureaucracy bottlenecks (8.72%). It was observed that inadequate funds were the biggest source of complaint by the respondents. This implied that respondents might not be able to improve their livelihood due to their limited access to fund to finance their proposed business. The high interest rates charged by the credit sources may be due to their profit-making orientation. It could also be inferred that respondents using these credit sources may have their micro enterprises threatened as a large percentage of their revenue goes to credit repayment.

The issue of untimely credit delivery might be because these sources require time to assess the credit worthiness of the borrowers. Untimely credit delivery may have adverse consequences such as defaults on the success of the borrowers' proposed business. In terms of getting guarantors, the responsibility for credit repayment in the event of default makes it highly unlikely for the women studied to acquire one. Also, shorter payback period length does not provide adequate time to utilize credit obtained thereby making it easier for the respondents to default. However, complaints about bureaucracy and protocol could be attributed to their low literacy in the filing of forms before the processing and approval of credit.

73.84% of the respondents repaid the credit obtained from business earnings. Sales from household assets (4.07%), loans from other microcredit institutions (3.49%), borrowing from friends and relative (10.47), remittances from household members (6.4%) and allowances (1.74%) constitutes other sources of repayment. However, the higher percentage of those able to repay due to profit is indicative of the success of the micro enterprises. And this success improves the welfare (access to food) of the women micro entrepreneurs and their households. The repayment made through allowances or sales of property might be linked to non-productive use of the credit or failed businesses. Repaying credit from allowances would compromise income allocated to other areas such as food and sale of property implied loss of collateral for credit and endowment for accumulating capital.

Figure 1 showed respondents distribution of monthly income before and after obtaining micro credit. It was evident that there was improvement in the respondents monthly income after the intervention, the mean income of the respondents increased from ₦35,124.00 to ₦55,425.00. This is a signal that there is an increase in the respondents' financial base and they could now save money to expand their businesses. This finding is in consonance with [2] conclusion that once given the opportunity, clients of microcredit providers expand their businesses and increases their incomes. It must be noted however that such amounts are likely to be gross income which includes expenditure made from the daily sales especially for food and other household basic needs. Most women do the shopping for the upkeep of their households from the sales of the day. They only multiply money realized during the day based on service they have rendered with the number of days in the month. This amount will be reduced if they were to consider their net income. It is possible that people are prepared to engage in activities that bring in some amount of money, no matter how small it might be as long as it can assure the provision of their household's basic need for food.

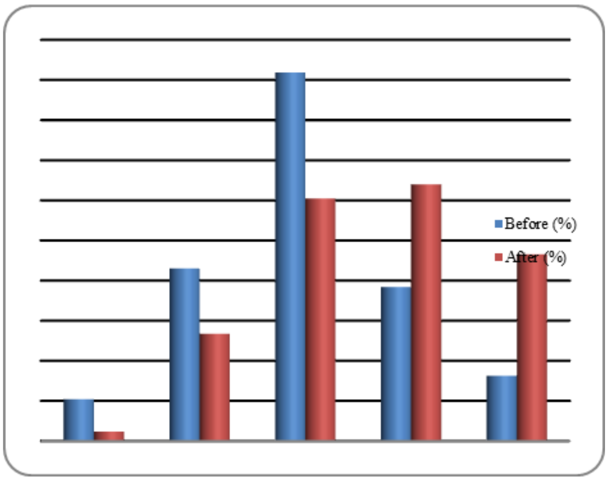

Fig. 1. Monthly Income of Respondents Before and After Obtaining Microcredit.
Source: Field Data, 2015.

Using contributions of microcredit to beneficiaries' business sustainability, development and local governance participation as indicators of beneficiaries' empowerment as shown in Table 3 and Figure 2, it is evident that the female micro entrepreneurs through the availability of microcredit are increasingly empowered. Specifically, 90.28% claimed personal development through self respect, self confidence, leadership skills, and payment of children school fees; 82.81% claimed that their business is now sustainable by having control over their business, saving money to expand the business and acquisition of training in the business among others; and 75.67% asserted local governance participation through participation in community elections, communal labour, meetings and fighting for human rights. This finding is consistent with [3] that savings through microcredit lead to capital accumulation which will then enhance the individual's independence in raising needed capital for expansion and thus reduce their vulnerability and build up their self confidence.

[15] asserted that credit is a vital instrument for improving the welfare of the poor directly as well as enhancing their productive capacity through financing investment in human and physical capital. Using quality of household meals intake, employment conditions, housing and quality of education of children as indicators of household welfare, the study found that there were improvements in all the indicators.

Table 3. Distribution of Respondents by Empowerment Characteristics.

Statement	SA	A	U	D	SD	Mean
Contribution of microcredit to beneficiaries' business sustainability						
Control over business micro enterprise	132	27	9	4	0	4.6686
saving money to expand business	128	34	8	2	0	4.6744
acquisition of training in the business	125	12	17	14	2	4.3837
keeping records on business transaction	84	33	11	26	18	3.8081
training of employees	47	39	18	32	36	3.1686
Contribution of Microcredit to Beneficiaries Development						
Self- respect	162	10	0	0	0	4.9419
Self Confidence	161	11	0	0	0	4.9360
Leadership Skills	150	14	8	0	0	4.8256
Ability to pay social levies	109	18	19	14	12	4.1512
Acquisition of household items	148	19	5	0	0	4.8314
Payment of Children School fees	148	18	4	2	0	4.8140
Assistance to Parents	147	19	4	2	0	4.8081
Acquisition of Clothes and Footwear	130	25	17	0	0	4.6570
Sense of autonomy	88	13	14	25	32	3.5814
Social network	79	27	16	17	33	3.5930
Contribution of Microcredit to Beneficiaries Local Governance Participation						
Participation in Community Elections	81	63	19	7	2	4.2442
Participation in Communal Labour	74	51	21	15	11	3.9419
Participation in Meetings	61	43	22	25	21	3.5698
Fighting for Human Rights	42	48	25	37	30	3.3779

Means were calculated from scale: SA (%); A (4); U (3); D (2); and SD (1).
Source: Field Data, 2015.

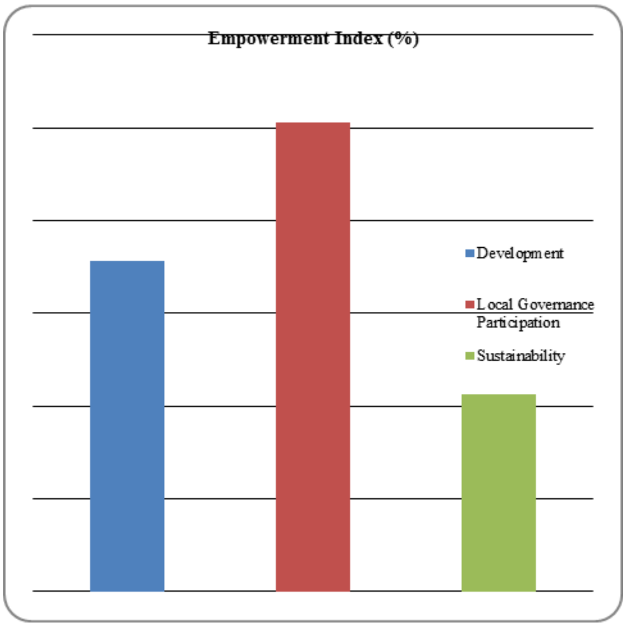

Fig. 2. Distribution of Respondents by Empowerment Characteristics.
Source: Field Data, 2015.

Many respondents were able to further the education of their children (96.04%), improve on quality of meal intake (86.67%), household employment conditions (88.60%) and household housing conditions (78.60%). This agrees with the findings of [20] that giving support to women enterprises with credit enables the core poor to save, and cater for most social services.

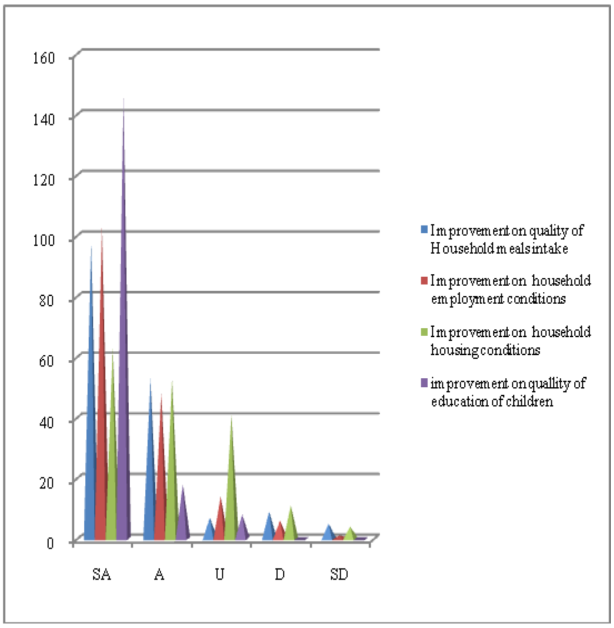

Fig. 3. Distribution of Respondents by Welfare Characteristics.
Source: Field Data, 2015.

CONCLUSIONS

The study focused on the effect of microcredit on rural household livelihood with emphasis on women micro entrepreneurs in Oyo State, Nigeria. This was achieved by examining their socioeconomic characteristics; determining factors contributing to household welfare and respondents' empowerment. Based on the evidence emanating from descriptive statistics employed for this study, it could be concluded that microcredit has a positive influence on rural household livelihood. Findings emanating from this study show that formal and informal credit coexist in the study area. It was obvious from the result that microfinance institutions received more patronage than any other credit source in the study area. Microcredit is a primary mode of income for business start up and expansion for female micro entrepreneurs in the study area. These micro enterprises therefore serve as source of employment as well as income for household survival and well being. Above all, the study has shown that microcredit assists women in making better lives for themselves and their families through their micro enterprises, foster savings, women development, sustainability and independence. It is recommended that Government, Non Governmental Agencies, policy makers and other stakeholders that are devising policies relating to accessibility of microcredit should take in to consideration the results of this study for better promotion of microcredit among women micro entrepreneurs.

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OPPORTUNITIES FOR CREATION OF INTEGRATED TOURISM PRODUCT (FOLLOWING THE EXAMPLE OF THE MUNICIPALITY OF VELINGRAD)

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Abstract

Since the beginning of the new century there is a trend in Bulgaria towards increasing demand for specialized tourism services. Although our country has unique combinations of natural and anthropogenic resources, they get quickly exhausted as an attraction. This requires continuous updating of tourism product in order to adapt it to the ever changing needs of users. Good prerequisites for that are presented in creating an integrated tourism product based on the available resources for development of rural and spa tourism in the region of the municipality of Velingrad - which is the subject of this research. On the one hand, the area is well-established and rich in mineral waters; it has the relevant facilities for development of SPA services and, on the other hand, it has the necessary prerequisites for development of rural tourism. The author states that, given the upcoming tourism regionalisation of the country, the creation of an integrated tourism product is the basis for achieving high competitiveness of tourism at international level.

Key words**:** *development of rural areas, integration, integrated tourism, rural and SPA tourism*

INTRODUCTION

Velingrad is located 130 km from Sofia, and 80 km from Plovdiv in the western part of the Rhodope mountain. Beautiful nature and deposits of mineral waters make Velingrad one of the leading “balneological” resorts in the Balkans.

Photo 1.Velingrad Panorama

Velingrad was established in 1948 upon the merging of three settlements – Kamenitsa, Ladzhene and Chepino.

The Chepino region became a part of the Bulgarian state as early as the First Bulgarian Empire.

The Tsepina Fortress, and also the entire region fell under the Ottoman power in 1371 – 1373.

The Tsepina Fortress is a monument of culture with national significance. It was built on a rocky hill with elevation of 1136 m, and during the Middle Ages the fortress was a political and administrative center. Recently the foundations of the fortress walls, the foundation of the church and four water reservoirs were renovated. There is an exposition of the finds, discovered upon its archaeological surveys in the foot of Tsepina.

Workshops and enterprises for wood material processing were established in the region around Velingrad after the Liberation from the Ottoman Empire in 1878.

Velingrad is also famous for the largest karst spring in Bulgaria, called Kleptuza. Its output is from 600 to 1200 l/sec, and supplies two ponds with a separated resting area with water wheels on the side.

The average annual air temperature in the resort is + 9.3°C with average January and July temperatures at + 1.8°C and + 18.7°C, respectively.

Velingrad is in the first place in Bulgaria in terms of abundance and diversity of its mineral waters, the temperature of which varies between 28°C and 91°C. The diversity of mineral waters has also lead to diversity of options for use of the mineral water – for relaxation, rehabilitation and recovery. Mineral baths, swimming pools, beaches, balneological sanatoriums, and SPA hotels are available for tourists. The hottest water is in the section of Kamentsa – with temperature of up to 91 C.

The mineral water and the procedures which are offered in Velingrad have favorable influence upon the locomotory system,, neurological disorders, hypertonia, gynecological problems, renal and urological, respiratory and stomach, and intestinal illnesses.

During the mass forceful conversion to Mohammedanism (Islam) of the Bulgarians in the region in the second half of the 17th century, many people had escaped and had hidden in the forests, in order to keep their Christian faith. After that most of them had settled in the residential section of Kamenitsa, where they had built the temple “St. Trinity”. Secretly a dug out was excavated, it was turned into a chapel and liturgies were performed there. In 1933, it began the painting of the temple, which continued for nine years. In 1965 the church was reconstructed. The church takes 211 square m. built up area; the building is massive, and the walls are constructed of stone with thickness of 0.80 m.

Another interesting place in Velingrad is the History Museum. In it one can see one of the richest expositions of painted Easter eggs in Bulgaria.

Many protected territories are located in the region of Velingrad – Valyavitsite, Rogachitsa, Chernovets (Arapchal).

The only deposit in Bulgaria of the plant Spiraea salicifolia L is situated in the region of Tazhnika near the river Dospat. In June-July the plant blooms with pink-red grape racemes; on the inside its branches are hollow. It was used for the production of pipes. The plant is included in the Red Book of Bulgaria (a list of endangered, disappearing and extinct biological species found in the territory of Bulgaria).

There are many natural landmarks in Velingrad and around it. At a distance of 35 km from the town, near the village of Pobit Kamak is situated a rock formation with the same name. The form of the coarse-grain granite resembles the Russian dolls.

The Yundola resort is situated 16 km from Velingrad. It is an appropriate place for winter, as well as summer tourism. The Lepenitsa cave is also situated 13 km South-west of Velingrad. The cave is 1,525 long and it has two-storey galleries, underground river and lakes. For the visitors, it is interesting to see the variety of stalactites, stalagmites, columns, and stone curtains, which reflect in the crystal-clear water of the lake. One thing among the richness of the cave is the cave pearls, and the cave craters are a unique find in Bulgaria.

At the sanctuary at the mount of Ostrets (1,369 m above the sea level) are found multiple remains of the clay pots, dating back to the late iron age (6th – 1st century BC).

The narrow-gauge railway line Septemvri - Dobrinishte passes through Velingrad. Transportation of goods was also performed along it in the past, but nowadays it is only intended for transportation of passengers.

In Velingrad there are more than 40 hotels and holiday homes, 2 sanatoriums, 140 catering and entertainment establishments. The public mineral baths are modernized, and 22 open and covered mineral swimming pools are built.

The Sarnitsa dam is also located in the territory of the municipality of Velingrad, and there are also other dams nearby – Belmeken, Batak, Beglika which are a favorite destination not only to fishermen, but also to enthusiasts of mountain tourism. There are also other mountain resorts nearby – Tsigov Chark, Sports Complex Belmeken, etc.

You can receive more information about the town, its landmarks and accommodation places in the Information Centre for Small and Middle-Sized Business, which is situated on

Svoboda Square [8].

The combination of mild climate, solar radiation and mountain forests together with hot mineral springs, combined with the Bulgarian traditions makes the municipality very suitable for development of integrated tourism and organic agriculture [5]. Organic agriculture is practiced in 160 countries of which 45 are in Europe. The share of organic land of the world agricultural area is very small, accounting just for 0.9 % [7].

There are 32 hotels, 2 health recreation centers and 140 restaurants and leisure places only in the municipal centre – town of Velingrad as well as public mineral baths and 22 open-air and covered mineral pools. The geographic and climatic conditions favour eco-tourism, ski-tourism and hunting tourism. Another significant economic sector is wood logging and wood processing as well as some chemical industry and machine building. Wood processing accounts for 35 % of the total GDP of the municipality, 21 % are formed by agriculture, 19 % by trades and 6 % are formed by hotels and recreation facilities. The major part of the firms (75 %) functions in the service and tourism sector. Agriculture is mainly represented by animal breeding – sheep and cow breeding, poultry.

Also there is high available potential for RES utilization in Velingrad Municipality in solar thermal and PV, waste wood biomass, geothermal power, small hydro power. There is untapped potential of Small HPPs as well as of space heating and DHW preparation using geothermal power from the hot mineral springs.

Within Green Twinning activities Velingrad Municipality is developing knowledge on sustainable energy planning and project identification and implementation [5].

MATERIALS AND METHODS

The purpose of this study is to bring out the possibilities of creating an integrated tourist product in Bulgaria. The subject of this study is the municipality of Velingrad because of the availability of the necessary resources for development of different types of specialized tourism – balneological and SPA tourism, rural and ecological tourism, adventure tourism, and others.

On the other hand, creating prerequisites for development of an integrated tourism and integrated tourist product is also favourable for the sustainable development – "a trend that, on a global scale, gains more and more popularity and more and more supporters ". The main advantage in this direction is that the town of Velingrad is already a recognizable spa destination and its services are typically sought by solvent, well educated tourists who are interested in new, unconventional experience. This, in turn, leads to increase of the opportunities for attracting incoming tourist flows and presence of potential customers for the new and different tourist services that are offered.

For the purpose of this study and gathering the necessary information different techniques are used such as analysis, deduction, observation, informal interviews.

On the basis of the Case study method, the conclusions made from the study can be validated for the country as well, and the integrated tourist product of the municipality of Velingrad can be adapted as a model for achieving sustainable tourism, which aims to influence tourists not only during their journey [6], but to turn into a behavioral model.

RESULTS AND DISCUSSIONS

The success of tourism activity is largely associated with the condition of the environment where it is organized. This connection between tourism and natural environment is bilateral. Over the past 20 years European tourism has been characterized by a high rate of development, which has resulted in pressing the main tourist resorts and the areas unused so far, mostly the sea coasts. This has led to management problems in terms of the conditions, amenities and visitors. The awareness of environmental problems caused by tourists has led to actions in the public as well as the private sector, and their aim is to tackle with the problems encountered as a result of tourism activities.

In this sense, the appearance of rural tourism as an alternative type of tourism is quite natural. It opposes to the mass (industrial) tourism which facilities and tourism product are characterized by a standardization that has already become rather depressing. The term "rural tourism" is interpreted differently in different countries and covers a range of diverse economic and narrowly specialized tourism activities carried out only in rural areas or, generally, in areas outside the urban agglomerations. As time goes by, multiple concepts arise in tourism practice that define tourism in rural areas – agricultural tourism, farm tourism, rural tourism, alternative tourism, ecotourism and others, that have different meanings in different countries.

In order its essence to be clearly and universally defined, the European Union has adopted the term "rural tourism" as one that sums up all the tourism activities in rural areas. At present, rural tourism is seen as a set of activities developed in the countryside that offer an alternative to the dynamic and intense rhythm of life in the cities. It covers travel to rural areas, stay in a country house, as well as conduct of specific scientific research in conjunction with a hobby or profession. The definition covers the whole agricultural surroundings, traditions, customs, holidays, visits to agricultural museums, monitoring and participation in traditional agricultural activities and craft industries, as well as the forms of tourism that are directly related to the farm in case of an extended stay or single visit. The development of rural tourism is inevitably accompanied by parallel development of other forms of tourism concerning the specific additional attractions of the region.

Rural tourism as a holiday in the countryside is not just fashion but a necessity, given the pollution of the natural environment, the dynamic and intense rhythm of life in the cities, which naturally urges people to search for tranquility and relaxation amidst clean natural environment and more secluded places. In a number of developed Western European countries such as France, England, the Netherlands, Ireland, Germany, Spain and others, rural tourism is stimulated at national level. Tours to villages and rural areas already occupy second place after the seaside holidays.

This specific type of tourism is provoked primarily by the saturation of tourism supply with standardized, traditional and monotonous offers that do not bring any diversity in tourist vacation (sea, mountain, routes related mainly to cities). On the other hand, the excessive ecological, physical and moral demolition of tourist areas increases. Thirdly: the excessive dynamics and automation of urban conditions that characterize the contemporary lifestyle. This type of tourism is characteristic of highly urbanized countries and it develops because of the desire for a return to nature since it enables many people to experience nature in its primary form or in rural environment to discover unknown crafts, interesting attractions, gastronomy, new forms of culture, and all this without spending so much money. Rural tourism is an original way to seek an exit from the ever-perilous practice of mass tourism which is entirely economically oriented and largely ignoring the environmental, social and moral values.

Rural tourism can be connected and combined with the services of a number of other specialized forms of tourism – cultural, wine, ethnographic, culinary, environmental, hunting and more. In this way a network of regional business structures offering a specific regional product including a whole complex of services and products can be created [1]. Moreover – in recent years two regions with a large concentration of small and medium-sized tourist enterprises for rural and other types of tourism have been established where a significant investment of capital is made regarding the social and economic situation of the region [4].

Economic and social benefits

Rural tourism is considered to be an adequate tool for regional development, contributing to:

- Increase of the land price
- A better basis for the facilities of the local population
- Improvement of the regional infrastructure
- Diversity in the labor workforce
- Additional income for the local population
- Improvement of agricultural environment and rise of the socio-economic status of these

regions

- Promotion of cultural diversity, preservation of national heritage, appreciation of the lifestyle and traditions of local people and respect for their privacy and dignity.
- Increase of awareness of the "feeling" of nature. Rural tourism should stimulate in tourists appreciation and understanding of the ecosystem and need for its conservation.
- Minimization of the negative effects on natural and social environment caused by traveling of tourists.
- Rural tourism is deemed to have a significant advantage because it does not harm the environment and, at the same time, contributes to the regional development. It allows for the use of an already existing accommodation, thus reducing the investment costs and preventing the seizure of forest and pasture areas. Spending the holidays in such regions with low density of tourist flow allows tourist facilities to be distributed more evenly in the territory. This is useful not only for the environment, but it also brings additional income to the local population.

In addition, rural tourism creates opportunities to meet the tourist needs of disabled people and it also contributes to their quicker socialization. The recreation of family atmosphere and friendly attitude are at the root of it [2].

Infrastructure

Each single element - subsystem has its own number of peculiarities. Green natural environment ensures sustainability to the system. It is the spatial "framework" of rural tourism. It includes not only its inherent geographical elements, but also a number of anthropogenic resources, mainly in the fields of cultural values (lifestyle, mentality, folk music). In other words, the host environment has not only a physical, but social dimension as well, which emphasizes the distinctive character of the product.

Tourism infrastructure should be considered in several directions:

1. A means of shelter to tourists, which in most cases is also the home of the villagers. Also, we have to add the farmyard or the farm which are of great interest to tourists and especially children (care for animals and birds, growing vegetables and fruit). Here the focus is on preserving an authentic lifestyle and architecture.
2. Engineering infrastructure related to lighting, heating, telephone lines, road network, water supply, etc. Without them the normal consumption of the specific product of rural tourism is impossible.
3. Production infrastructure that is focused on practicing crafts and production of typical rural souvenirs (authenticity); preparation of local specialties including with the participation of the tourists themselves: regional cuisine, pickled vegetables, sausages, jams, dried fruit, etc.
4. Social infrastructure that serves to activate the contacts between villagers and tourists: cultural house, cinema, local festivities (fairs), carnivals, competitions, games, etc.

Tourism infrastructure should meet two basic requirements:

- To create normal conditions for the tourists' stay
- The disturbance of green natural environment to be reduced to the minimal degree possible.

The tourist is the subject of rural tourism, the important element of its market, especially with their motives, expectations, internal attitude. The host is regarded as a general concept that refers to the local population. It is the host who carries out the majority of services, homemade cooking, preparation of special homemade dishes, caring for the farm animals and/or the garden. And once again, it is the host who introduce tourists to folk crafts, folklore, customs and lifestyle. The host is a leading figure in this type of tourism. The level of tourists' satisfaction from a countryside vacation depends to a great extent on the host's skills, natural culture and spirit.

Integration

From functional point of view rural tourism is closely linked to other types of tourism. Above all, it is linked to recreational (sea and mountain) tourism, cultural tourism, as well as certain types of specialized tourism (hunting and cult tourism). With these types of tourism it shares a common integrated green natural environment. In organizational aspect, family tourism business appears to be the unifying basis.

All this allows rural tourism to be included in combined tours and thus to exert multiplying impact on the traditional tourist routes. For example, coastal and maritime recreational tourism can be combined with a vacation in the countryside. This is especially useful for large seaside tourist resorts that can diversify their product with visits to villages or other forms of route-cognitive tourism. It is possible to form specialized tours that include different objects of rural tourism: visit of a group of monasteries, natural phenomena, boat trips combined with accommodation in tents, etc. Rural tourism can also satisfy specific hobby interests with scientific goals: photo love, collecting herbs and minerals; collection activity in the sphere of folklore, linguistic studies, etc.

In view of the growing interest to weekend holidays and extended weekend holidays it is possible weekend tourism to be introduced in rural areas as a way to diversify tourists' leisure time [3].

Each country or region places its own imprint on the development of rural tourism, and new forms and perspectives are sought. Local communities, legislative authorities, representatives of various sectors of the economy are involved in their realization. Rural tourism appears to be one of the important moments in the development policy of rural areas. Programs for support and investment in this sphere are being implement, exchange of experience and information is organized.

The role and significance of Rural Tourism as a factor for sustainable development of rural areas

In the last 20 years tourism in rural areas has grown as a business activity which is due not only to the users' interest in a different kind of holiday, but also to various government initiatives and policies in this direction. This activity has been growing particularly intense in developed countries where targeted efforts are made to promote rural tourism. The reasons for this targeted policy are rooted in the concept of tourism as a means for economic recovery of rural areas and a way to maintain and protect the environment.

The main positives for the regional development, which rural tourism determines, can be summarized to: maintaining a higher level of land price; improvement of regional infrastructure; diversification of opportunities for employment; generation of additional income for the local population and increase of the socio-economic status of the regions; improvement of the quality of environment; promotion of cultural diversity, preservation of national heritage, lifestyle and traditions and many others.

One of the significant advantages of rural tourism regarding protection of the environment and promotion of regional development is the limitation of investment costs and prevention of transformation of forest and pasture areas into urbanized areas since the existing accommodation in rural areas is used, also tourist facilities as well as the tourist flows are more evenly distributed on the territory of the country.

The development of tourism activities in rural areas is a subject of great interest at both individual entrepreneurial as well as regional and national level. An evidence for this is the overlapping of tourism in all plans for regional development, as well as the increased interest of entrepreneurs to programs that provide funding for activities in this direction. As some reports of State Fund Agriculture and State Agency for Tourism show, State measures 311 "Diversification into non-agricultural activities" and 312 "Aid for the creation and development of micro-enterprises", of the Rural Development Program 2007-2013, are among the most attractive ones - they attract the most interest, including the new project submission which started on 14 June 2010.

On the demand side there is also a growing interest in this type of tourism. As shown by some nationwide surveys of tourist flows in Bulgaria, 15.6% of Bulgarians and 6.4% of foreigners, who rested in Bulgaria in the summer of 2009, chose rural tourism as a type of tourism.

Ever since 2006, the Strategy for the development of sustainable tourism has been implemented in the municipality of Velingrad; its main objective is to preserve the identity and to develop the potential of destinations

"Velingrad" and „Velingrad Region":
The region does not have, nor is it allowed to promote, highly developed unsustainable forms of tourism connected with change of natural landscape, large-scale developments, or damage to nature by building facilities or otherwise.

CONCLUSIONS

The forms of tourism that cause damage to the social environment or the elements of cultural or natural heritage are not developed nor promoted in this region.

The local entrepreneurs develop or aim to develop sustainable tourism in this town and the neighboring villages.

The socio-cultural boundaries of the region are separate and distinct.

The tourism products and services offered in the region are associated with unique features and identity of the region.

Traditional customs, cuisine, handicrafts, folklore are cherished and preserved; they are not only practiced but also offered as attractions by the local entrepreneurs.

Presence of transport-communication links on the territory and resort-tourist resources.

The local community has an attitude to support and realize the need to protect the natural and cultural heritage and the development of sustainable tourism.

The construction of new buildings in the region complies with the traditional architecture of the region regarding the appearance and size of the buildings.

This strategy has been sculpturing the tourism sector in Velingrad for seven successive years in order to implement the common vision:

"Tourism in Velingrad, the municipality and the adjoining tourist region is developing on the basis of preservation of natural and anthropogenic resources and natural landscape. Velingrad preserves the brand of a leading thermal center and the distinction "Spa capital of Bulgaria", and it develops quickly as a balneological and spa resort".

A key strategic objective in the development of sustainable tourism in the municipality of Velingrad and its tourist region is the "Transformation of Velingrad tourist region into a leading tourist destination in the sphere of balneotherapy and spa tourism in Europe for the period 2007-2013, with a permanent supply of year-round tourism product."

After seven years of implementation of the above strategy many visible changes in the desired directions can be named, but still there are some unresolved problems in the field of infrastructure, marketing, supply of a variety of complex/varied tourism products.

Thus, deficits are not in the accommodation base but in tourism products and their marketing. The summary diagnosis of the tourism sector in the municipality is: "tourism resources that are not fully tapped, comparatively cheap tourism" .

Conveying the previous assessment and planned actions from the municipal plan, one of the strategic directions for the development of the municipality can be reaffirmed in the new planning period as well – "development of sustainable tourism". Municipality of Velingrad is "gifted" with rich resources and capabilities for a wide range of tourist products:

Alternative tourism: It is considered that the municipality of Velingrad has the potential for development of ecological and rural tourism .

The utilization of financial resources of the Rural Development Program should lead to the formation of finished, marketable products, enhancing the attractiveness of the region and diversifying the main supply in balneology.

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REASONS BEHIND SUCCESS AND FAILURE OF BIOGAS TECHNOLOGY: A CASE OF DISTRICT DERA ISMAIL KHAN (PAKISTAN)

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Abstract

This paper's aim is to determine the success and failure status of bio gas technology (BGT) in one purposively selected district in Khyber Pakhtunkhwa (Pakistan). Five villages were selected randomly as a sample out of all villages in the district. Data were collected by using qualitative methods involving secondary sources, community transect walks, informal interviews, group interviews from February to April 2015. Results reveals that overall BGT success rate was not very good (i.e. 69%) in the context of available resources. Proper bio digester (BD) operation was the main reason of success characterized with sufficient as well as regular feeding of substrate to bio digesters and eventually it resulted in better maintenance level. In addition, farmers' rationality and activeness were found significant factors in BGT success regarding their attempts to know about highly recommended bio digester construction and operation procedure. Another reason of success was experienced masons who knew the design of BD construction but unfortunately they were not good enough for the whole project area, some were good while others were careless. The main reasons of BGT failure were use of poor quality of construction materials and inexperienced masons, poor quality of construction materials, improper and irregular feeding to bio digesters, poor monitoring of The Foundation for Integrated Development Action (FIDA) field staff, improper need assessment of beneficiaries by FIDA, improper site selection for building BD and 100 % subsidization rate by FIDA to provide bio digesters.

Key words: *bio digester, biogas technology, Pakistan, qualitative methods, success & failure*

INTRODUCTION

Pakistan is a country facing energy crises. The country depends mostly on the imported oil and gas that is subjected to disruptions and price instability (Harijan et al., 2009) [3]. Nearly 31% of the country's energy requirement is relying on imports (Asif, 2011) [2]. The oil import bill of Pakistan increased in recent years. The aggregate energy supplies in the country amounted to 64.5 million tonnes of oil (TOE) equivalent and registered a growth of 2.3 % over the previous year (HDIP, 2010-2011) [4]. One percent of the energy is supplied through renewable energy sources as compared to conventional energy sources supplying 99% of the energy (Sheikh, 2010) [11]. The gap between energy demand and supply continues to increase (Shah et al., 2010) [10]. Statistics suggest that gap between energy demand and supply in Pakistan has increased six times over the last thirty six years (Asif, 2011) [2].

Pakistan's geo-morphological setup, climatologic cycles, geo-locations and agricultural activities contain a great potential of renewable resources which if brought into practice efficiently can play a key role in achieving energy sustainability and security in the country (Ibrahim, 2009) [5]. The Alternative Energy Development Board has been established for the development, promotion and facilitation of renewable energy technologies and aims that by 2030, 5% of the energy consumption of the country will be met through renewable sources. In fact, renewable energy sources have a great role in bridging the gap between energy demand and supply in the country (Sheikh, 2010 and Amjid et al, 2011) [1, 11].

Biogas, as a type of renewable energy makes proper use of locally available biomasses such as livestock dung and by-products of crops. It produces clean fuel for household cooking and provides an enriched bio-fertilizer as residual by product for improving fertility of agricultural lands. Promotion of biogas technology is considered as best option which on one hand can reduce wood consumption and on the other hand facilitate recycling of agro-animal residues into bio-fertilizer. Furthermore, it also contributes towards environmental protection. Experts have calculated that anaerobic fermentation of dung, through installation of about 5.0 million family sized bio digesters, could fulfill the cooking needs of 50 million people. It is calculated that biogas can meet about 50% of the cooking requirement of the rural masses, along with the production of 96.6 million kg of bio-fertilizer per day or 35.04 million tons of bio-fertilizer per year (Sheikh, 2010 and Asif, 2011) [2, 11].

Achieving the effective utilization of biogas in rural vicinities depend mainly on successful BGT adoption capability of farmers. There are a number of research studies related to BGT with regard to its different socioeconomic aspects. Talukder (2010) [12] found that the reasons behind better inspiration towards BGT are its lower operation costs, more income saving, environment friendliness, reduced use of chemical fertilizers and increased agricultural production. According to a study conducted by Remais et al. (2009) [9], public health can be made better with diffusion of rural energy sources. They found that after the installation and successful operation of the bio digester, the expenditure on buying coal, wood and crop residues reduced by 68%, 74% and 6% respectively. Clean kitchens and improved sanitation were seen as benefits by the users over the non-users. However, the main motivating factor for adoption of BGT was the subsidy provided by government for biogas digesters. Ilyas (2006) [6] investigated that the main motivating factors of popularity and growing demand of biogas included reduction of the workload for women and girls due to wood collection, dung cake making and cooking and increased crop production because of bio slurry usage as an organic nutrient rich fertilizer. Raven and Gregaseen (2005) [8] found three key factors for the successful adoption of biogas plants, namely the bottom-up strategy and support by the government, a dedicated social network for continuous development of biogas plants without interruptions, and specific local circumstances.

Innovations are important for rural development and there is evidence of many studies on success and failure of different innovations but, especially, such studies are few regarding biogas technology as mentioned in above literature. Such studies have not been found at all in Pakistan especially in Khyber Pakhthunkhwa province. Various government and non government organizations running projects to implement BGT in KPK. However, such projects result in successful installation and operation of BGT while others upon completion result in failure. Therefore, this research was considered important to pinpoint the main reasons of success and failure of biogas initiatives in order to make BGT more effective weapon for reducing energy crises in the country.

The study was based on the following objectives:

(i)To find out the socioeconomic, ecological and resource endowment features of the research area.

(ii)To determine the main reasons of success and failure of biogas initiatives in the area.

MATERIALS AND METHODS

This study was carried out in rural areas of KPK well known to be typical farming area with low energy consumption. The study site is characterized as famous district in Khyber-Pakhtunkhwa Province, Pakistan. It is situated at 31.83° North latitude, 70.9° East longitude and 166 meters elevation above the sea level. Dera Ismail Khan has a hot desert climate with hot summers and mild winters. Spoken languages include Saraiki, Pashto, Urdu and English. It has historically strategic location and has traditionally been a crossroads for many cultures and trading routes. It has an area of more than 7,326 s. km. with an estimated population of more than 1.0 million. The urban ratio of the population is 14.7% while the rest is rural. The ratio of the population below poverty line is 24.4% (KPK GOVT, 2013) [7].

At the first stage of sampling, district Dera Ismail Khan was selected purposively because it was the only district where the number of bio digesters was highest compared to other districts where the number was too less. In addition, success and failure phenomena of BGT were common in the area. At the second stage of sampling, five villages were selected randomly as a sample out of all villages in the district. The list of biogas users were obtained from the NGO named as FIDA (Foreign Integrated Development Action). Data were collected by using qualitative methods involving secondary sources, community transect walks, informal interviews, group interviews from February to April 2015. An attempt was made to develop a complete picture of the major activities and processes involved in success and failure of bio gas technology. The data collection was ended when no more new relevant information on activities and processes became apparent. Finally, the collected data were summarized and presented for drawing conclusions.

RESULTS AND DISCUSSIONS

The Socioeconomic, Ecological and Resource Endowment Features

A group interview containing five key informants (1 key informant from each village) was conducted for getting social economic data of villages. The resource map was used as a tool that helped us to learn about the community and its resource base. The main purpose was to learn the villagers' perceptions of what natural resources were there in their community. The resource map was found as a good tool to begin with and it was found easy and fun for the participatory group. Overall, in study site, fuel sources included wood, fan gas and other crop residues for bio gas non users while bio gas users mainly were dependent on bio gas as fuel source. Grazing lands were more because there were more fallow lands due to insufficient irrigation water availability. The area was plain but sanitation of rain water was found as a big problem of the area. Farmers used water pumps to evacuate rain water from their fields. There were five villages in union council “Kech” named as Ghulami Wala, Sardari wala, Jabbari wala, Muqeem shah and Kech. The total population was 62,350 persons & 6,135 households in this union council. These figures were verified by a nearby school head teacher (Mr. Rafeeq Sahib) who had been in census department for a long time. Pakhuns and saraikies were found as two main ethnic groups. Most commonly they are in contradictions. Pakhtuns are more offensive in every matter and they dominate the saraikies. Women - men ratio was almost 40%-60%.

Important historic events included the flood (2010) in which there was a huge threat to the whole union council and surrounding areas. Nearly 50% of the homes, crops and food stocks were damaged; and livestock were also died. Consequently, people migrated to other areas. Drinking water was found unhygienic and of bad smell, with limited number of borings (of 300 feet depth) had drinkable water, the rest of the water was not good. So, people got drinking water from those houses. The livestock also do not drink such water and they have to be walked to the rivers. People cannot make tea in such water.

The villagers’ profession was mainly agriculture i.e. they are cultivators and they work on daily wages at farms (labour) and some cultivate in their own lands while few people have government jobs. Nearly 15,815 acre of land was under cultivation out of which 35% - 40% was rainfed while the rest was irrigated but rainfed lands were found more fertile than irrigated lands. It also included 15 orchards. The widely grown crops included wheat, rice, sugarcane, gram, barley, maize, oat, millet, buck-wheat, paddy, mustard, field pea, sugar beat, tomatoes, mint and onion.

Livestock include cows (majority), then buffalos, sheep, goat and poultry. Infrastructure was found very poor characterized as streets were found not cemented. Water sanitation from houses and farms especially rain water is a big issue in the area. Irrigation water was found insufficient to cover the whole irrigated lands. The water channels were not cemented making the water to be absorbed by the soil. Therefore, some of the farmers installed small tube wells which draw underground water and they irrigate their rest of the lands. There were 24 small tube wells for rainfed and 22 for irrigated lands. In addition, the big farmers got advantage by having good relations with the irrigation department, thereby providing enough water to their lands.

There were considerable number of schools, shops and hujraz. In hujras especially social interactions happens in happy and sad occasions. There were many private dispensaries and one Basic Health Unit as well. There were village organizations, community organizations and one LSO (local support organization) all working with some NGOs such as FIDA (Foreign Integrated Development Action). Socio cultural features include local celebrations like Eid and Maila Span (racing contest of cattle).

The Reasons of BGT Success

Success of BGT in this study meant production of bio gas after installation of bio digesters and the successful operation and maintenance of BD. Data from survey results shows that overall BGT success rate was not very good (i.e. 69%) in the context of available resources. Successful BD users who had properly operated their bio digesters were producing enough bio gas. Proper BD operation was characterized with sufficient as well as regular feeding of substrate to bio digesters and eventually it resulted in better maintenance level. One BD was found a mysterious case which was producing gas without being fed for the last 10 years. The researcher observed personally and there was still fluid inside outlet of that BD. In addition, those farmers' rationality and activeness were found significant factors in BGT success. These characteristics led them to demand better quality technical support services from FIDA and communicated with them properly during BD building process. In addition, they got more information from other BD users in rest of the country in order to follow highly recommended bio digester construction and operation procedure. Another reason of success was experienced masons who knew the design of BD construction but unfortunately they were not good enough for the whole project area, some were good while others were careless.

The Reasons of BGT Failure

Failure of BGT in this study meant no productions of bio gas either immediately after installation of bio digesters (i.e. since first day of BD operation) or after using bio digesters for some time period. Among the first form of failure, 24 bio digesters out of 150, did not start working since first day of BD operation and consequently were broken by households. The main reasons of such case were use of poor quality of construction materials and inexperienced masons. Actually, the households were expected to buy construction materials by themselves which raised ambiguity about its quality and masons were trained and provided by FIDA. However, masons were not experienced which explains that FIDA selected improper masons. They did mistakes in measurement of BD design which resulted in improper bio digester construction.

The households completed initial feeding of water-dung mixture in four days rather than in one day time which was recommended for optimum gas production initiation. In addition, some households did not feed bio digesters fully during initial feeding which caused lower production rate and finally closed. In addition, monitoring of FIDA officials for those bio digesters was not proper compared to others. During the group interview, FIDA social organizer "Mr. Sadiq Awan" stated, "during first and second phase of project implementation, the service quality of FIDA organization was not good due to the interference of political and other pressure groups on selection of beneficiaries".

The poor planning of FIDA was also result of such form of failure. At first phase of BD provision, FIDA paid cost of BD construction in advance to households and they were expected to build BD under monitoring and technical support of FIDA. Consequently, the first 20 households got money but they did not start bio digester construction and used that amount for their daily expenditure.

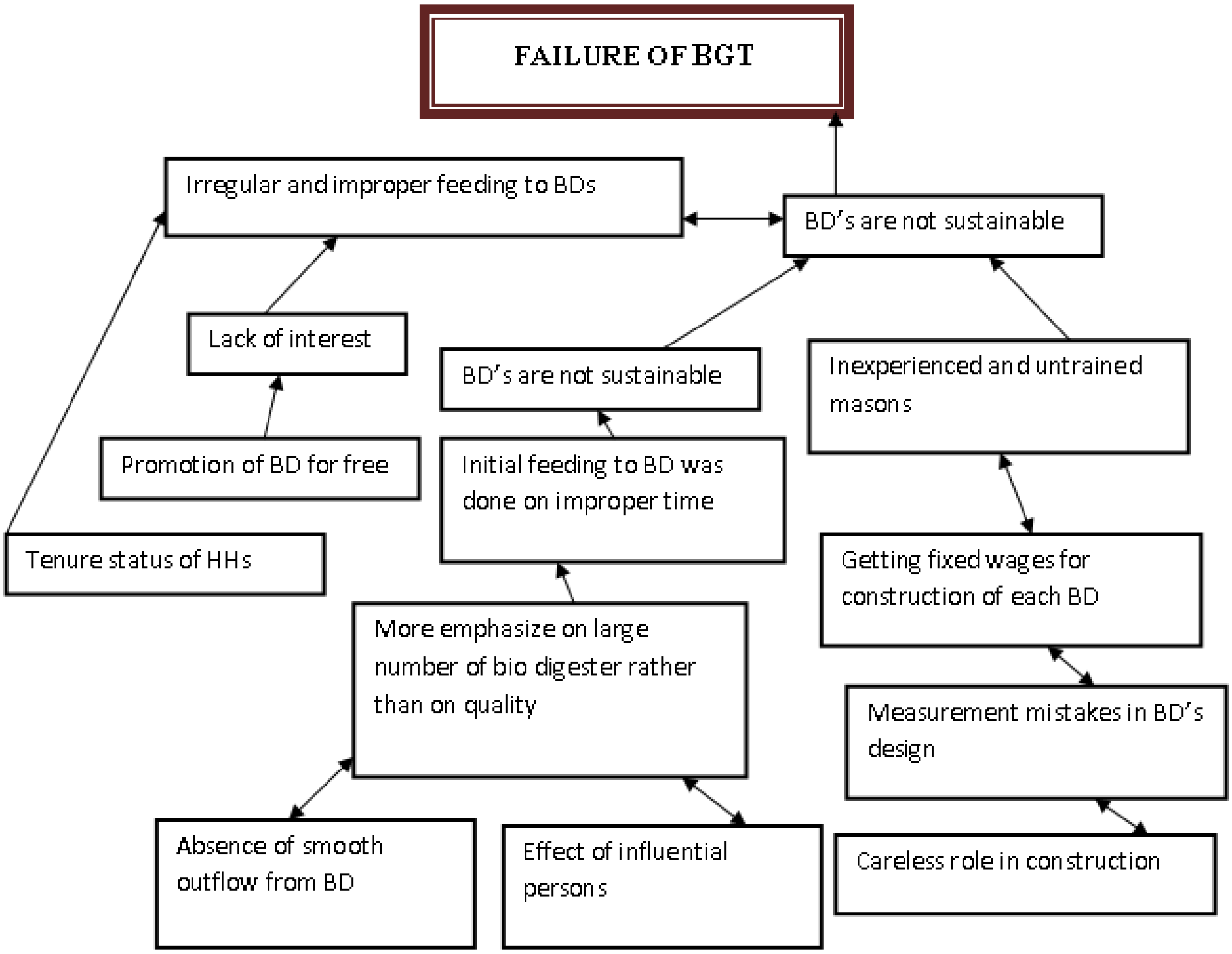
FAILURE OF BGT
Irregular and improper feeding to BDs
BD's are not sustainable
Lack of interest
BD's are not sustainable
Inexperienced and untrained masons
Promotion of BD for free
Initial feeding to BD was done on improper time
Tenure status of HHs
Getting fixed wages for construction of each BD
More emphasize on large number of bio digester rather than on quality
Measurement mistakes in BD's design
Absence of smooth outflow from BD
Effect of influential persons
Careless role in construction

Fig. 1. Problem Tree Analysis Diagram
Source: Group Interview

At this, FIDA changed their payment mechanism and decided to pay BD costs after completion of BD building process. In fact, FIDA did not notice individual fuel sources' characteristics properly because households having increased amount of fuel wood were found to have low interest towards BGT.

Among the second form of failure, 23 bio digesters were working well since first day of operation but later on with the passage of time, the production rate of bio gas gradually decreased and eventually stopped working any more. The main reasons of such kind of failure included provision of bio digesters to large family sized households who were found that they had insufficient amount of gas according to their daily energy consumption needs which lost their interest about proper operation and maintenance of BGT and consequently their bio digesters were categorized under failure case. Improper content of water-dung proportion, its improper mixing and irregular feeding was another factor. Improper site was selected for building BD which caused bio digester not exposed to full amount of sunlight, thereby reduced production rate of bio gas as well as some households broke down their BD with the fact that they choose to build room at that place. In this context, it was found that 100 % subsidization rate by FIDA was found one of the major reasons of farmers' careless attitude.

Some of the land owners who were bio gas users and were not associated with farming activities took help of their tenants to do daily feeding operation of BD which reduced the quality of BD operation and maintenance and gradually resulted in low production. Three bio digesters blasted due to high bio gas pressure which indicated that the households were not having sufficient skills in order to estimate the amount of dung required against the amount of biogas utilized for cooking (over dozing of dung to bio digester was reported).

However, some technical reasons of failure were also noted such as one household claimed that his BD was not working for the last 5-6 months and the problem was when the dung was fed in the inlet tank, it came out again in inlet tank and thereby very little production of bio gas and no outflow was seen.

Problem Tree Analysis was done to verify the results from respondents regarding reasons of BGT failure by a heterogeneous group containing 6 intellectual persons related to BGT.

According to Problem Tree Analysis results (Fig. 1), the inexperienced and untrained masons who built bio digesters, the poor performance of FIDA providing BGT and irregular and improper feeding to bio digesters by households, were among major reasons.

There were found sub reasons of this which included their careless role, mistakes in measurement of BD design and provision of fixed payment per building BD not on daily wage basis. The masons choose to build more bio digesters and thereby to earn more money. On the other hand, outflow from bio digesters was not smooth which was positively linked with mistakes in measurement of bio digester design which was further linked with FIDA's more emphasize on large number of bio digester rather than on quality. In some cases, FIDA field workers recommended to households to feed BD just after 2 days of completion of BD building.

However, it was found that FIDA's project activities were affected by influential persons in the area. In addition, the irregular and improper feeding of bio digesters by households was due to 100% subsidization to BD building to household which resulted in their lower interest level.

CONCLUSIONS

The study's major objectives were to determine the Socioeconomic, Ecological and Resource Endowment Features and success and failure status of BGT in one purposively selected district in KPK (Pakistan). Results reveals that overall BGT success rate was not very good (i.e. 69%) in the context of available resources. Proper BD operation was the main reason of success characterized with sufficient as well as regular feeding of substrate to bio digesters and eventually it resulted in better maintenance level. In addition, farmers' rationality and activeness were found significant factors in BGT success regarding their attempts to know about highly recommended bio digester construction and operation procedure. Another reason of success was experienced masons who knew the design of BD construction but unfortunately they were not good enough for the whole project area, some were good while others were careless.

The main reasons of BGT failure were use of poor quality of construction materials and inexperienced masons, poor quality of construction materials, improper and irregular feeding to bio digesters, poor monitoring of FIDA field staff, improper need assessment of beneficiaries by FIDA, improper site selection for building BD and 100 % subsidization rate by FIDA to provide bio digesters.

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EFFECT OF ENTREPRENEURIAL SKILLS ACQUISITION ON THE WELFARE OF AGRIBUSINESS HOUSEHOLDS IN ABIA STATE, NIGERIA

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Abstract

This study was undertaken to estimate the determinants of entrepreneurial skills acquisition among agribusiness households in the study area and determine the relationship between their skills and their household welfare. A multi stage sampling technique was employed in the selection of 80 households from 5 local government areas out of the 17 local government areas of the state. Primary source of data was obtained from using a set of questionnaire were administered on the respondents to obtain the needed data for the analysis with multiple regression and simple correlation. The results showed that sex, marital status, expenditure of the respondents had positive and significant effect on their entrepreneurial skills, while the respondents' age, access to credit and experience though had significant effects possessed negative signs on their entrepreneurial skills. The result also revealed that there was a positive relationship between entrepreneurial skills and entrepreneurs' welfare. It was therefore recommended that, Effective and adequate entrepreneurship policies that will help to equip agribusiness entrepreneurs with entrepreneurial skills should be put in place. Secondly, youths should be encouraged to acquire at least one skill or another as this will a go a long way in curbing the menace of unemployment which has risen so high in Nigeria. Thirdly, programmes on agribusiness should be developed while addressing factors that hinder its growth and development as a way of actualizing the current change agenda and economic diversification of the present federal government of Nigeria.

Key words: *agribusiness, acquisition, entrepreneurial skills, households, welfare*

INTRODUCTION

Entrepreneurs have been referred to as necessary prerequisite to mobilize capital, exploit natural resources and create markets to carry on trade [6]. They are agents who perform a vital role in the economic development of a country and are linked to the overall industrial development of any nation.

Entrepreneurship can be described as a creative and innovative response to the environment and situations, particularly economic environment. These responses can take place in such areas as social endeavour, business, industry, agriculture, education, social work, etc.

In Nigeria, the federal government both past and present has initiated several measures and policies to reduce the level of poverty among the citizens. One of such measures is entrepreneurship which is aimed at reducing mass poverty and unemployment in the country.

For most countries the development of industry had depended a great deal on the role of private sector. Entrepreneurship has played a major role in this regard. [13] had noted that the promotion and development of entrepreneurial activities would aid the dispersal and diversification of economic activities and induce even development in a country. To [19]entrepreneurial development in Nigeria should be perceived as a catalyst to increase the rate of economic growth, create job opportunities, reduces import of manufactured goods and decrease the trade deficits that result from such imports.

Some authors including [8] had asserted that if Nigeria desire to move out of the disturbing high level of unemployment and ravaging level of poverty, adequate attention must be given to the growth of entrepreneurship. To them, Nigeria still remains in the doldrums because of the combination of ignorance, low capacity building and lack of encouragement of entrepreneurship. Entrepreneurship, according to [12] is the process of emergence behaviour and performance of entrepreneur. Entrepreneurship education is a structured formal conveyance of entrepreneurial competencies, which in turn refers to the concepts, skills and mental awareness used by individuals during the process of starting and developing their growth-oriented ventures. Another view of entrepreneurship education is the term given to someone who has innovative ideas and transforms them to profitable activities [17]. Entrepreneurial orientation is the development of entrepreneurial skills, effective and efficient application of the skills in management of business to create a significant difference from other business, recognizing the skill and allowing it to function effectively. Several studies on entrepreneurship concentrate on the contribution of entrepreneurship to sustainable economic development, job creation, innovation and resource allocation, but there is a little attention on effect of entrepreneurship training and education on poverty alleviation in Nigeria. The study area Abia state seems to be more worrisome given that the commercial hob centre Aba, which is euphemistically referred to as the “Japan of Africa” is in the state.

The success of entrepreneur in business depends on many factors including training and education, but these are often negligible [14]. Also, most of the government efforts to reduce poverty in the country were not tailored towards entrepreneurship education and organization of training for the unemployed people in the society [14].

There are certain personal characteristics that may facilitate or inhibit individuals to pursue entrepreneurial activities. Although it is very difficult to measure certain qualities that may engender entrepreneurship, there are certain indicators such as, but is not limited to, education, age, wealth, and work experience.

Individuals move into occupation that will give the greatest returns on their talents [9]. In other words, the activities the most talented people choose have significant effect on their welfare. When talented people become entrepreneurs, they improve technology in the line of business they pursue and as a result, productivity and income grow, thereby improving the welfare of individuals in the country.

A key observations of many studies including, [4] and [11] is the inherent hierarchy of occupational choice according to which the most productive individuals become entrepreneurs, the next best choose self-employment, and the rest become workers or subsistence workers. At equilibrium, the lowest productive individuals are workers; individuals with intermediate productivity are informal entrepreneurs and those who are most productive are the formal entrepreneurs. This implies that the acquisition of entrepreneurial skills improves the welfare of individuals and families. As an entrepreneur, ideas and talents are enhanced and developed to become a reality, by so doing, jobs are created, in other words, the welfare of individuals in the country is influenced or affected positively.

Studies have shown that skill acquisition is the most critical factor in the utilization of entrepreneurship opportunity for self-employment [5]. There is a rich literature providing insights into the determinants of entrepreneurship and its economic returns. According to the expected utility theory, individuals choose self employment when they expect higher returns from doing so relative to wage-employment [21]. In contrast, according to the non-pecuniary benefits theory, people select into entrepreneurship even if the expected returns are lower, in search of non pecuniary benefits such as being their own boss [7]. However, entrepreneurs are not a homogenous group of individuals and the type of entrepreneurship engaged in may have a significant effect on the returns. Therefore, the objectives of this study is to ascertain the various entrepreneurial skills owned by the agribusiness entrepreneurs; estimate the determinants of entrepreneurial skills acquisition among the respondents in the study area; and determine the relationship between the skills and the respondents' welfare.

MATERIALS AND METHODS

Study Area. The study area is Abia state, Nigeria. It is one of the 36 states in Nigeria and is located in the south eastern geographical zone of Nigeria. The capital is Umuahia and the major commercial city is Aba. Abia state was created on 27 August, 1991 from part of Imo state; it is one of the constituents of the Niger Delta region. Abia state consists of 17 local local government areas and they are; Aba north, Aba south, Arochukwu, Bende, Ikwuano, Isiala Ngwa north, Isiala Ngwa south, Isuikwato, Obingwa, Ohafia, Osisioma Ngwa, Ugwunagbo, Ukwa west, Ukwa east, Umuahia north, Umuahia south, Umu Nneochi. Abia state lies within latitude 5°25'N and 7°30'E of the Greenwich meridian. Abia state consists of three senatorial districts, and they are; Abia south, Abia north and Abia central. According to the [10]Abia state has a population of 2,833,999 persons.

Abia state, occupies an area of 5,834 square kilometers, and is bounded on the north and northeast by the states of Anambra, Enugu, and Ebonyi. To the west of Abia is Imo state, to the south is River state. The climatic condition of Abia state could be as typically equatorial with two main seasons, which are the dry and rainy seasons. The main commercial centre of the state is Aba which is often times referred to as the "Japan of Africa" due to the entrepreneurial spirit of the people who are engaged in all kinds of trade.

Besides oil exploration, farming also assumes the main occupation of the people. The state has a large number of youths with very few having what they do to earn a living. The relevance of the youths in the state necessitated the establishment of entrepreneurship programme in the state to aid youth employment.

Sampling Technique. The sampling technique that was adopted is the multi stage sampling technique. In the first stage, out of 17 local government areas, 5 local government areas were selected as a sample to represent the population. The local government areas were, Umuahia North, Ikwuano, Ossisioma Ngwa, Aba North and Aba South. In the second stage, two autonomous communities were randomly selected from each of the selected local government areas. In the third stage, two villages were randomly selected from each of the communities, making it a total of twenty villages. In the fourth stage, four individuals were included in the sample from the twenty villages, making it a total of 80 respondents. This was the sample size for the model sample.

Data Collection and Method of Data Analysis

This study employed primary source of data obtained from using a set of questionnaire administered to the respondents selected and employed simple descriptive statistics, simple correlation analysis and multiple regression in the analysis of the data collected.

Model Specification. The multiple regression analysis was employed to estimate the determinants of entrepreneurial skill acquisition among the respondents. The regression model is explicitly specified as follows:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + e_i$$

where:

Y = entrepreneurial skills among the respondents
X_1 = Age (years)
X_2= Sex (1 if male; 0 if otherwise)
X_3 = Marital status (1 if married; 0 if single)
X_4 = Household size (number)
X_5= Level of formal education (years)
X_6=Income (Naira)
X_7=Expenditure (Naira)
X_8=Access to credit (1 if any, 0 if otherwise)
X_9 = experience (years)
b_0 = Intercept
e_i = error term

The entrepreneurial skills were ranked with the aid of a 5 likert-type scale: very strong (5), strong (4), neither strong nor weak (3), weak (2), very weak (1), and a mean score obtained which was later used as the dependent variable (Y) for each respondent.

Correlation analysis was employed to determine the relationship between the skills and the respondents' welfare. In this study, the respondents' welfare has been proxied per-capita consumption expenditure. Correlation may be defined as the degree of relationship or association between two or more variables.

Correlation (rxy) is expressed as:

$$\frac{n(\Sigma XY)-(\Sigma X)(\Sigma Y)}{\sqrt{[n(\Sigma X^2)-(\Sigma X)^2]\,[n(\Sigma Y^2)-(\Sigma Y)^2}}$$

where:
X = mean deviation of the respondents with entrepreneurial skills
Y = mean deviation of the respondents' welfare
∑ = summation

RESULTS AND DISCUSSIONS

Various skills owned by the entrepreneurs in the Study Area. The various skills owned by the respondents in the study area are shown in Table 1.

Table 1. Distribution of various skills owned by the respondents in the study area

Entrepreneurial skills	Frequency	Percentage
Decision making initiative	55	45.8
Risk taking	33	27.5
Creative	45	35
Self -confidence	56	46.67
Management skill	52	43.3
Communication skill	44	36.7
Resilience	22	18.33
Self-motivation	46	38.33
Ability to organize	53	44.17
Perseverance	33	27.5

Source: Field Survey Data, 2016
*Multiple responses recorded

The various skills owned by the respondents in the study area are presented in Table 1 above. The Table 1shows that majority (45.8%, 46.67%, 44.17%, 43.3%, and 40.8%) indicated that they can make good decisions, they have self-confidence, have the ability to organize management skills and have initiative to exploit new opportunities. The respondents in the study area also have the following entrepreneurial skills which includes; creativity (37.5%), self-motivation (38.33%), communication skill (36.67%), risk taking (27.5%), perseverance (27.5%) and the least of them, resilience (18.33%).

Estimates of the Determinants of Entrepreneurial Skills among the agribusiness entrepreneurs in the study area. The estimates of the determinants of entrepreneurial skills among the respondents in the study area are presented in Table 2.

Table 2. Double log Estimates of the Determinants of Entrepreneurial skill acquisition among agribusiness entrepreneurs in the study area

Variables	Coefficient	Std. Error	T values	Significance
Age	-0.144***	0.050	-2.884	0.000
Sex	0.044*	0.018	2.451	0.018
Marital status	0.082**	0.021	3.838	0.000
Household size	-0.012	0.023	-0.527	0.600
Education	0.022	0.076	0.292	0.771
Income	0.007	0.024	0.311	0.757
Expenditure	0.098**	0.029	3.374	0.002
Access to credit	-0.060*	0.025	-2.366	0.022
Experience	-0.073**	0.029	-2.517	0.009
Constant	1.733***	0.385	4.504	0.000
R^2	0.881			
F- ratio	308.866***			

***Significant at 1%, ** significant at 5 %, *significant at 10 %.
Source: Field Survey Data, 2016

The double log functional form was chosen as the lead equation out of the four functional forms because of some econometric considerations as, the size and magnitude of significant variables, the highest R^2 and the highest F-ratio. The result of the analysis in Table 2 showed an R^2 value of 0.881, which implied that 88.1% of the variation in the level of entrepreneurial skills of the respondents (agribusiness entrepreneurs) was explained by the independent variables considered in the model. The remaining

11.9% may be due to the absence of some variables not included in the model or as a result of error. The result also showed an F-ratio of 308.866 with a positive significance of 1% probability level. This confirmed the model as a good fit.

The result in Table 2 revealed that sex, marital status, expenditure of the respondents had positive and significant effect on their entrepreneurial skills, while the respondents' age, access to credit and experience do had a significant effect possessed negative signs on their entrepreneurial skills.

From the result, the coefficient of age was statistically significant at 1% probability level with a negative sign. This implies that as the age of the respondent's increases, the probability of acquiring skills for entrepreneurial activities decreases. Generally, skills are acquired within the youthful ages. At older ages, people may no longer have interests to acquire skills, probably because they feel they had spent a greater part of their lives; and therefore may not see or have any need for additional entrepreneurial skills. This result is in conformity with previous studies of [20, 18] which showed negative relationship.

Sex was statistically significant at 10% probability level with a positive sign. This implies that males are most likely to acquire these entrepreneurial skills for entrepreneurial activities than females do. This may probably be because female entrepreneurs in the study area were often underestimated, overlooked and most a times hindered from some of these activities due to cultural barriers such as male/female role definition that label women inherently inferior to men. This may also not be unconnected with the fact that male are the bread winners and in that consciousness will like to live up to expectations as the bread winners of the family. This is consistent with the findings of [2], that men are the bread winners and as such are more likely to engage in income generating activities.

Table 2 also indicated that marital status was statistically significant at 1% probability level with a positive sign. This implies that married entrepreneurs are more likely to acquire entrepreneurial skills for entrepreneurial activities more than those that are single. This may probably be because of the weight of family responsibilities which leaves them with no choice than to acquire the entrepreneurial skills for entrepreneurial activities to be self-employed, thereby generating income for their personal and family needs. This result conforms to previous study of [16].

The coefficient of expenditure was statistically significant at 5% probability level also with a positive sign. Expenditure was used as a measure for welfare in the study. This implies that the more the acquisition of these skills, the higher the respondents' welfare. This goes to justify the position advanced by various scholars that entrepreneurial skill acquisitions actually improve individual welfare [1, 15, 3]. Furthermore, according to [2] individual standard of living after the entrepreneurial skill acquisition programme is at the average. Given this, it goes to show that the people can be able to afford the basic necessities.

Access to credit was statistically significant at 10% probability level with a negative sign. This implies that with increasing access to credits, the likelihood of skill acquisition reduces. Generally, people acquire skills to become independent and financially self reliant. However, access to credit may serve the same purpose. In the sense that with access to credit, one may embark on whatever venture of interest.

Experience of the respondents was statistically significant at 5% probability level with a negative sign. This implies that as the experience of the respondents increases, the probability of acquiring entrepreneurial skills for entrepreneurial activities decreases. An entrepreneur with reasonable number of years of experience in a chosen area may not see any need to acquire more entrepreneurial skills for his/ her entrepreneurial activities since they are well experienced in their various businesses and doing well in them.

Relationships between the Skills and the Respondents' Welfare

The relationship between the entrepreneurial skills and the respondents' welfare was analyzed using correlation analysis and this is presented in Table 3.

Table 3. Relationship between the skills and the respondents' welfare

Correlation	**0.996*** **
Significance	0.000
N	80

Correlation is significant at 1 % level.
Source: Field Survey Data, 2016

The result in Table 3 revealed that there was a positive relationship between entrepreneurial skills and entrepreneurs' welfare. The expenditure of the respondents was used as a measure for the entrepreneurs' welfare. Based on the result, the relationship was significant at 1% level of probability. The result implies that the more skills the entrepreneurs' have, the higher the probability of attaining better welfare by their households. An entrepreneur with larger number of skills will have greater opportunities of being employed or have self-employment than those with fewer or not at all. Given this, the tendency to generate or earn better income to fend for him or herself and households is higher than when otherwise. This goes to justify the position advanced by various scholars that entrepreneurial skill acquisitions actually improve individual welfare [1, 15, 3].

CONCLUSIONS

Based on the major findings of this study, it has been concluded that the entrepreneurial skills have positive and significant effect on welfare of households. This could in one way or another offer employment to the teeming population of unemployed youths and by so doing reduce youth unemployment and poverty.

It is recommended that:

(i)Effective and adequate entrepreneurship policies that will help to equip the youths and agribusiness entrepreneurs with entrepreneurial skills should be put in place. This policy should cover areas like training workshops and seminars from time to time to equip and update the entrepreneurs' skill base.

(ii)Secondly, youths should be encouraged to acquire at least one skill or another as this will a go a long way in curbing the menace of unemployment which has risen so high in Nigeria.

(iii)Thirdly, programmes on agribusiness should be developed while addressing factors that hinder its growth and development as a way of actualizing the current change agenda and economic diversification of the present federal government of Nigeria.

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ASSESSMENT OF AGRICULTURAL INTERNSHIP TRAININGS EXPOSURE TO STUDENTS AND THEIR JOB ASPIRATION IN NIGERIA UNIVERSITIES

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Abstract

The study assessed agricultural internship trainings being exposed to students and their job aspiration after Universities education with the aim of identifying different trainings exposed to them. A Multistage sampling procedure was used to select two hundred (200) respondents from four (4) Federal Universities in South Western Nigeria. Descriptive and inferential statistics were used to analyse data collected. The result revealed that the mean age of the respondents was 24 ± 2.33 years, and majorities (72.5%) of the respondents' parents were educated up to the tertiary institution. It was observed that the trainings exposed to the students differ across selected universities namely; Application of Computers to Agriculture, On-farm Demonstration, Teaching in Secondary School, Baking making, Tie and Dye, Horticulture crop production, Pasture production and Management technique. Furthermore, it was observed that respondents were exposed to the same trainings irrespective of their Departments except for Federal University of Technology because of the peculiarities of the Departments. Moreover, correlation analysis results revealed that there was no significant relationship between parents' working years ($r = 0.034; P\leq 0.05$), age ($r = -.078; P\leq 0.05$) and years of education($r = -0.045; P\leq 0.05$) of respondents and their job aspiration. The study recommended among others that Universities offering agriculture as a course should compare their curriculum periodically and the needs of students should be considered when drafting internship plan for trainings in order to motivate to embrace agriculture as a profession thereby enhance food security in the country.

Key words: *food security, internship, job aspiration, training*

INTRODUCTION

An internship is a system of on-the-job training that allows learners to gauge their interest in a chosen professional area. Internships also provide real-world experiences instead of second-hand experiences (Unknown, 2012) [7]. Training is the process of learning the skills you need to do a particular job or activity (Encarta, 2009) [4]. In other words, internship training is the period of a time a person learns and acquires skills and knowledge needed to carry out a specific assignment or qualifies for a particular job.

In Nigeria, due to the growing concern among the capitalists that graduates of our institutions of Higher learning lack adequate practical background studies preparatory for employment in industries, led to the formation of students Industrial Work Experience Scheme (SIWES) by ITF in 1993/1994 (SIWES, 2002) [6] which serves as an internship training programme for undergraduates. The SIWES is a skill Training programme designed to expose and prepare students of Agriculture, Engineering, Technology, Environmental, Science, Medical Sciences and pure and applied science for the Industrial work situation which they likely to meet after graduation (Wodi and Dokubo, 2009) [9].

A job is any activity such as trade or profession that somebody does regularly for a pay (Encarta, 2004) [3].

Aspiration however, is the desire or ambition to achieve something (Encarta, 2004) [3], that is attainable by conscientiously working towards it and with guided interest (Adebayo, 1995) [1].

Over the past decades, agriculture production has failed to keep pace with the growth in population and the poor performance of the agricultural sector becomes more glaring when compared with the average annual growth rate of about 6% for the economy as a whole over the same period. However, the role agriculture has played in Nigeria's economic life has decline tremendously (Mafimisebi, *et. al.*, 2010) [5] as a result of the drudgery nature of agriculture due to overdependence on hand tools, investment in developing countries (Nigeria) usually discriminate against agriculture, backwardness of the rural areas where farming activities dominate, lack of social amenities in the farming areas, and also the honour given to a farmer can be compare to that of a slave in the society due to the widespread stigma of poverty, illiteracy. A lot of graduates of agriculture still prefer to work in a non agricultural sector in order to earn a living for themselves. This eventually led to persistent reduction in labour and food production. In view of these, the study seeks to provide answer to the following question among others in order to determine the knowledge, skill and the practice acquired by students during the internship training: what are the types of internship training the students were exposed to?

Objectives

(i)determine the influence of personal and socio- economic characteristics of the students on their job aspirations.

(ii)identify the type of internship training given to students in the selected universities

Hypothesis one: There is no significant relationship between the personal and socio economic characteristics of undergraduates and the job aspiration.

Theoretical framework

The instrumental motivational theory is adopted for this study. Instrumental motivation for present actions that results from already anticipated future goals (e.g., to do one's best in school to become a teacher) is extrinsic motivation. The present actions are then perceived as instrumental for achieving future goals. Such activities are not auto-telic but derive utility value (Wigfield and Eccles, 2002) [8] from those goals in the near or distant future. Learning and getting good grades have a utility value (Eccles and Wigfield, 2002) [2] when they are perceived as instrumental for achieving other goals in the near or distant future. This implies that instrumental motivation requires that students have set goals for themselves in the near and distant future, that they developed a future orientation or future time perspective (FTP).

MATERIALS AND METHODS

The study was conducted in four selected federal universities namely; Obafemi Awolowo University, University of Ibadan, Federal University of Technology, Akure and Federal University of Agriculture, Abeokuta.

The four universities were randomly selected in the south west region of Nigeria. Final year or fifth year students were purposively selected for the study because they had undergone the internship during in their fourth year. In all, thirty seven (37) departments were selected from the four universities selected. A proportionate sampling technique was used to select fifty (50) students in each university selected. Random selection was used to select the respondents for the study. A total of two hundred (200) were selected in the study area.

Data for this study was collected from two major sources.

(a)Primary source: this includes data that was collected by interviewing some students using questionnaire.

(b)Secondary source: secondary source was sourced from books, reports, journals, and internet as well as papers presented at seminars, conference about the internship training.

In analyzing the data, Descriptive and inferential statistical techniques were used. Descriptive statistical techniques like frequency counts, percentages, mean, standard deviation, Bar chart were used to analyze the data where appropriate. Chi-square (x^2) and correlation (r). (Inferential statistical technique) analyses were carried out to determine the relationship between the socio economic status (parents' profession and education) and students' job aspiration.

RESULTS AND DISCUSSIONS

Section A. Demographic characteristics of respondents

Data in Table 1 showed that the average age of the respondents was 23.74years, majorities (60%) of the respondents were male, 60% of respondents' parents are civil servant, majorities (72.8%) of respondents' parents completed tertiary institution, 28.02 years is the average working years of respondents' parents, and 63% of the respondents were aspired to go into farming or agricultural related jobs. This is in agreement with Yusuf (2005) [10]. The results show that respondents were old enough to make choices of their own independent of external influence, and also have educated parents who can serve as guardians.

Table 1. Showing the demographic characteristics of the respondents (N = 200)

	Frequency	Percent	
Age			
Below 20	9	4.5	Mean =23.74 S. D = 2.332
21 – 25	144	78.5	
26 – 30	32	16	
Above 30	2	1	
Parents' working year			
below 10	5	2.5	Mean =28.2 S. D = 8.64
11 – 20	24	12	
21 – 30	132	66	
31 – 40	33	16.5	
41 – 50	3	1.5	
Above 50	3	1.5	
Sex			
Male	120	60	
Female	80	40	
Years of education			
Below 15	4	2	Mean =18.69 S. D = 8.64
16 – 20	160	80	
21 – 25	35	17.5	
Above 25	1	0.5	
Marital status			
Single	197	98.5	
Married	3	1.5	
Parents' level of education			
Did not go to school	4	2	
Completed primary school	10	5	
Completed secondary school	41	20.5	
Completed tertiary education	145	72.5	
Religion			
Christianity	177	88.5	
Islam	21	10.5	
Others	2	1	
Parents Occupation or profession			
Farming/Agricultural related job	9	4.5	
Business/management	48	24	
Civil service	97	50	
Private Sector	13	6.5	
Others	30	15	
Total		**100**	

Field Survey, 2013

Types of internship training students were exposed to

Data in Figure 1 revealed that 73.6 percent of the respondents had their internship training for 12 months, majorities (42%) of the respondents had their internship training outside the school farm. However, there are some specific courses which the selected schools offered which are not done in other schools.

These courses were:

Obafemi Awolowo University: Application of Computers to Agriculture, On-farm Demonstration, Teaching in Secondary School, Greenhouse Operations

University of Ibadan: Baking making, Tie and Dye, wildlife reserve, pomology, biogenetic engineering, saw milling, silvicultural aspect of forestry, forest operation and management.

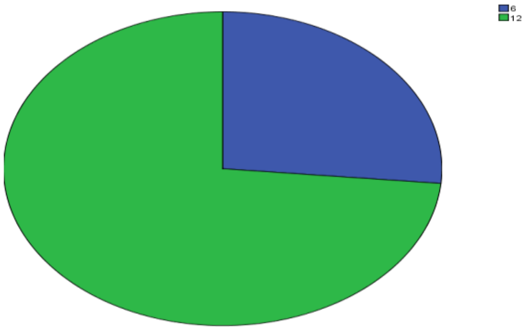

Fig. 1. Showing the duration of internship training of the respondents
Source: Field survey, 2013

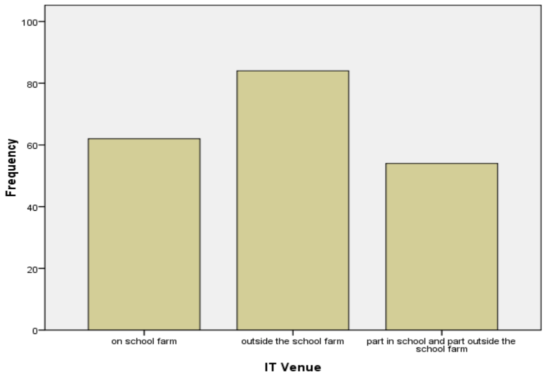

Fig. 2. Showing the internship venue of the respondents
Source: Field survey, 2013

Federal university of agriculture, Abeokuta: Horticulture crop production, Pasture production and Management technique, Crop post Harvesting technique, Agricultural meteorology, Organic Agricultural practices.

Federal university of technology, Akure: Students were exposed to different trainings based on their course of study or department. These departments are:

-**Agricultural economics and extension department**: Extension Training and Curriculum Development, Seminar in Agricultural Economics and Extension, Social Relationship and Behaviour Change, Project Appraisal and Planning, Research Methods in Social Sciences

-**Animal production and health department:** There is no course that is specific to this department which others are not doing.

-**Crop, soil and pest department**: Hatchery Technology

-**Environment and Wildlife Management department**: Biodiversity Conservation, Ecology and Management, Park Planning and Interpretation, Tourism Organization and Travel Planning, Ballistics and Weapon Training, Ecotourism Planning And Management, Cartography and GIS Techniques, Food Standards, Law and Quality Control, Remote Sensing

-**Food, wood, technology department**: Application of Geographic information System in Forestry, Agroforestry systems, Furniture Design and Production, Forestry Inventory, Wood Harvesting and Transportation, Pulping and Bleaching Technology.

Part B: Testing of Hypothesis

There is no significant relationship between job aspirations and the personal and socio economic characteristics of undergraduates (parents’ working years, age, respondents' years of education, sex, parents’ profession, parents’ education, and departments.

Testing this hypothesis involved the use of chi-square (x^2) and correlation (r). Data in Table 2 showed the result of chi- square analysis. At $P \leq 0.05$, there is no significant relationship between job aspiration and sex ($x^2 = 3.353$), parents’ profession ($x^2 = 9.844$), parents’ education ($x^2 = 9.793$).

Therefore, the null hypothesis is accepted that there is no significant relationship between the demographic characteristics and job aspiration of respondents.

Data in Table 3 showed the result of correlation analysis. At $P \leq 0.05$, there is no significant relationship between job aspirations and, family size($r = 0.034$), parents' working years (r = 0.034), age (r = -.078) and years of education(r = -0.045) of respondents. Thus, we accept the null hypothesis. This result implies that there are other socio economic factors influencing job aspirations of the respondents which this study didn't cover or investigate.

Table 2. Summary of chi-square analysis of job aspirations and selected demographic characteristics of respondents in the selected universities

Characteristics	Chi-square (x^2)	Degree of freedom (DF)	Contingency coefficient	Decision
Sex	3.353	4	.128	NS
Parents' profession	9.844	16	.217	NS
Parents' education	9.793	12	.216	NS

NS = Not significant
Source: Field survey, 2012

Table 3. Summary of linear correlation analysis of job aspirations and selected demographic characteristics of respondents in the selected universities

Characteristics	Correlation coefficient (r)	Coefficient of Determination (r^2)	Contingency coefficient	Decision
Age	-.078	0.608	0.452	NS
Family size	-.045	0.203	0.303	NS
Primary education	-.077	0.593	0.344	NS
Parents' Working year	.034	0.0012	0.681	NS

NS = Not significant
Source: Field survey, 2012

CONCLUSIONS

It was observed that the trainings exposed to the students differ from one university to the other. It was also observed that respondents were exposed to the same trainings in the selected universities irrespective of their departments (Obafemi Awolowo University, University of Ibadan, Federal University of Agriculture, Abeokuta) except for Federal University of Technology.

Internship training scheme is yet to achieve its objectives because of lack of feasible framework and follow up. Many institutions have developed their own plan of work for the programme yet it doesn't meet the need of the students. It is of great concern in this time of economy regression; where the need of agricultural professionalism is of high depend for food security, and sustainability. The internship training scheme should be evaluated, and necessarily adjustment should be put in place.

This study recommended among others that apart from exposing internees to modern agricultural development technologies through organized field trips. Universities offering agriculture as a course may compare their curriculum once in a while in order to be able to give internees almost the same trainings which will enhance food security in the country.

Also further investigation should be carried out to reveal other factors influencing respondents' job aspiration.

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PERCEPTION OF YOUTHS ON GOVERNMENT AGRICULTURAL DEVELOPMENT PROGRAMMES IN OSUN STATE, NIGERIA

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Abstract

The study assessed the perception of youths about Osun State Rural Enterprise and Agricultural Programmes (OREAP) in Osun State, Nigeria with a view to examine the socio-economic characteristics of the participating youths and their perceptions towards OREAP. A multistage sampling procedure was used to select 113 respondents. Interview schedule was used to collect data which were subjected to descriptive and inferential analysis to test the hypothesis. The results show that the mean age of the participants was 28.5 years with standard deviation of 4.3, about 62.8 percent were males with an average annual income of N166, 477.0K. Also, about 67.3 percent of the respondents indicated that the reason for participating in the programme was to be a well-trained farmer. Findings revealed that sources of information (χ^2 *=4.937,* $p \leq 0.05$*), occupation (*χ^2 *= 7.224,* $p \leq 0.01$*) were significantly associated to the perception of youths towards OREAP. Farm size (r=-0.367,* $P \leq 0.01$*), capital expenses (r= -0.655,* $P \leq 0.01$*) and income per annum (r= -0.310,* $P \leq 0.05$*) were significantly but negative related to the perception of youth towards OREAP. It was concluded that the main factors that limit youth involvement in the programme are inadequate materials services and finance among others. The major factors influencing youth participation in OREAP are youth unemployment, youth interest in agriculture and information availability.*

Key words: *agricultural programmes, assessment, perception, youth*

INTRODUCTION

Although “agriculture remains a key component of Nigeria’s economy, and currently contributes about 40 percent of the GDP and employing about 70 percent of the active population, the sector has however, significantly underperformed its potential”. This has been clearly manifested in the high cost of food nationwide, food insecurity both at the household and national level and malnutrition especially in children. It is unfortunate that the government of this country has not been able to engineer a sustainable agricultural development that would have ensure both National and household food security, improved rural livelihoods and indeed, make Nigeria’s agriculture competitive in the world agricultural market today. The current situation of food insecurity, rural poverty, and un-competitiveness of Nigeria in the world global food market is seemed not to be acceptable to government at all levels.

The poor state of youth participation in agricultural activities in Nigeria has been a matter of great concern among agriculturists, agricultural researchers as well as administrators. The term “youth” has been viewed as a concept and defined as the period in an individual’s life, which runs between the end of childhood and entry into the world of work (Onuekwusi and Effiong, 2002) [12]. People in this age bracket definitely constitute a sizeable chunk of a nations population on which the burden of nation building falls.

The present poor state of decline in agricultural production was dimmed the hope of raising the level of agricultural production to ensure sustainable food security for the ever increasing population of Nigeria (Daudu *et. al.*, 2009) [5]. With fewer youth into agriculture, the expected benefits accrue agricultural development may not come to reality. The development of the agricultural sector of the Nigerian economy therefore depends on the young people, more especially the rural youths. This is because a large population of youth represents the link between the present and the future as well as a reservoir of labour (Muhammad-Lawal *et. al.*, 2009) [9].

A major concern of the federal Government in Nigeria is how to tackle the problem of unemployment among the youths in the country. Various regions in Nigeria have designed and executed several self-empowerment programmes to enhance the economic empowerment of youths (Umeh and Odo, 2002) [16]. One of such programmes is Osun State Agricultural Youth Empowerment programme (OSSAYEP) [13]. The programme is to equip about 1,200 young school leavers annually with modern skills and techniques in the agricultural practices with intensive monitoring by government for the first year. They will be assisted with farm land, farm inputs and credit facilities (OSSAYEP, 2004) [13].

Other development programmes include the Agricultural Development Programmes; the National Agricultural Land Development Authority; the Strategic Grains Reserves Programmes; the Programme for Accelerated Wheat Production; as well as the development of the development of artisanal fishery, small ruminant production, pasture and grazing reserves among others. These programmes were conceived to promote utilization of land resources through subsidized land development, supply of farm inputs, services and credit extension to farmers, and institutional supports for produce marketing cooperatives.

In order to arrest youth unemployment and the attendant social menace in the Osun State, government approved the commencement of Osun Rural Enterprise and Agriculture Programme (OREAP) Youth Academy. The programme is expected to equip 610 youth annually with modern skills and techniques in the agricultural practices across the state. They will also be assisted with farmland, farm inputs and credit facilities after forming themselves into viable cooperatives groups. Another target of the program is to reduce or eradicate completely rural/urban migration of youths. The training centres for the programme are located in nine communities in the state namely: Osogbo (Kelebe), Ila-Orangun, Ede, Ile-Ogbo, Waasimi (Irewole), Ilerin (Ilesa), Esa-Odo, Ile-ife and Oyan.

Statement of research problem

The poor state of youth participation in agricultural activities in Nigeria has been a matter of great concern among agriculturists, agricultural researchers as well as administrators. This is because the present decline in agricultural production dimmed the hope of raising the level of agricultural production to ensure sustainable food security for the ever increasing population of Nigeria (Daudu et al., 2009) [5]. The development of the agricultural sector of the Nigerian economy therefore depends on the young people, more especially the rural youths. The problem of youth unemployment in Nigeria is presently a source of concern to all. There is increase in population and geometrical increase in youth population with an attendant low or zero employment for the learning youths of Nigeria. This situation is particularly prevalent in the rural areas and eventually leading to rural-urban migration of the youths. Efforts have being made by the some government administration to minimize the menace of youth unemployment by establishing programmes. Among them was Osun State Agricultural Development Program (OSSADEP) established in 1992 with mandates to supply of modern agricultural inputs like improved seeds, provision of necessary and appropriate guidance and supervision for the agricultural activities of participants.

The new government administration was not convinced with achievement of the programme which led to establishment of OREAP Youth Academy with the goal to equipping 610 youth annually with modern skills and techniques in the agricultural practices. Despite the establishment of OREAP, the level of youth participation in agriculture have not being encouraging with attendant insecurity of food in the state. These arouse the quest to assess OREAP among the youth in Osun State with aims of providing answers to the following questions: what are socio-economic characteristics of OREAP participating youth? and what are the perception of participating youths about OREAP?

The main objective of this study was to assess the Osun State Rural Enterprise and Agricultural Programme (OREAP) among youths in Osun State, Nigeria. It specifically examine the socio-economic characteristics of the youth participating in OREAP; and determine the perception of participating youths about OREAP. The hypothesis tested in the study was that there is no significant relationship between the socio-economic characteristics of the youths and the perception of participating youths about OREAP.

Theoretical framework for study

The study was rooted on decision theory propounded by Condorcet in 1793 [4] which states that human behavior is goal directed in the presence of options, human decides on option that best achieves their goals. The theory was developed by Condorcet in 1793 when he put forward the first general theory of the stages of a decision process. Modern proponents of decision theory include Simon (1960) and Dewey (1978) [6]. Dewey (1978) put forward the five stages of problem solving; these stages were later modified by Simon to three principal phases of decision making namely "finding occasions for making a decision; finding possible courses of action; and choosing among courses of action." (Hansson 1994) [7].The theory is concerned with identifying the values, uncertainties and other issues relevant in a given decision, its rationality, and the resulting optimal decision. It is concerned with the choices of individual and focuses on how an individual use freedom.

The theory is applicable to the study in that it serves as interplay between the variables in the conceptual model for the perception of youths about OREAP. The actors (youths) in this study make a decision based on their perception about the programme (OREAP).

MATERIALS AND METHODS

The Study Area

The study was conducted in Osun State in Nigeria. The state with an agrarian population of about 70% covers a vast landmass of 15,875 square kilometers and lies between longitude 6 º51'N and 8 º10'N on the North-South pole and latitudes 4 º 05'E and 5º02'E on the East - West pole with estimated population of about 4,137,627 (National Population Commission, 2006). The indigenes of the state are majorly Yorubas with non-indigenes from different part of the country. Traditionally, the people engage in agriculture and produce sufficient food mainly for domestic consumption. Major cash crops cultivated in the state include maize, yam, cocoa, pepper, vegetable, plantain, and banana.

Primary using interview schedule and secondary data using printed materials were used for the study. The population of the study was youth aged between 13 and 30 years. Multistage sampling procedure was adopted for the study. In the first stage, nine training centres for OREAP were identified namely: Osogbo (Kelebe), Ila-Orangun, Ede, Ile-Ogbo, Waasimi (Irewole), Ilerin (Ilesa), Esa-Odo, Ile-ife and Oyan. In the second stage, simple random sampling technique was used to select one training center each from the three agricultural development zone (ADPs) - Osogbo zone, Iwo zone and Ife/Ijesha zone. The training centre selected for the study were Ede training center, Ilesha training center and Ile- ogbo training center. There were 92, 117, 73 participants in Ede, Ilesha and Ile-ogbo training centers respectively. In the third stage, proportionate sampling technique was used to select 40 percent of the youth participants from each of the three selected training centers making a total of 113 respondents. Data collected were coded, summarized and subjected to both descriptive and inferential statistics. Descriptive analysis used were frequency counts, percentages, mean and standard deviation while the inferential statistics used were Pearson product moment correlation analysis and chi-square analysis to determine the significant relationship between the variables investigated.

Measurement of variable

Dependent variable

Factors that encourage the participation of youth in OREAP were the dependent variable and was measure using eight statements scored on a five-point Likert rating scale of Strongly Agreed (SA) =5, Agreed (A) = 4, Undecided (U) = 3, Disagreed (DA) = 2 and Strongly Disagreed (SD) = 1. They were required to indicate the factors that encourage participation in the programme based on the options provided as strongly agreed, agreed undecided, disagreed and strongly disagreed. The maximum score for a respondent was calculated as 40 while minimum was 8.

Independent variables

The independent variables include both the personal and socio-economic characteristics of the respondents such as sex, age, ethnic group, occupation, religion, marital status, years of formal education, income level and source of information. Nominal variables such as sex, marital status, religion, ethnic group, level of formal education, and source of information about OREAP were coded for the analysis.

RESULTS AND DISCUSSIONS

Socio-economic characteristics

Results in Table 1 show that the mean age of the respondents was 28.5 years with standard deviation of 4.3. This implies that most of the respondents were found within the World Development bulletin of 1991 report categorization of youth as people who fall within the age bracket of 12 – 30 years. According to Jibowo (1989) [8]people in this age category possess some characteristics such as innovation proneness, minimal risk aversion, faster reaction rate, less fear of failure, greater physical strength, greater knowledge acquisition propensity, love for adventure and faster rate of learning among others. This indicated that more of the participants were in their active productive years, which revealed that OREAP trains people who could be regarded as productive assets to the society and vital sources of manpower for development. Higher percentage (62.8%) were male, this is in agreement of findings of (Ogunremi *et. al.*, 2012) [10] which indicated that in most rural farming communities, men are more inclined to farming while women only occupy the position of farmers' wives and also women were found to have negative attitude towards agriculture. Higher percentages (68.1%) were single martially and conform to the findings of Chikezie *et. al.,* (2012) [3] and Ogunremi *et. al.,* (2012) [10] that since a high percentage of the youth are single and young; they had latent energy in them to go into entrepreneurship training without distraction from family members. However, this finding contradicts the findings of Perez-Morales (1996) [14] that young people in rural areas get married earlier and become involved in adult responsibilities.

Also, higher percentage (67.3%) had 13 years and above of formal education and their mean years of formal education of the respondents was 14.3 years with standard deviation of 1.9 years. The finding indicates that more than 50 percent of the respondents had high literacy level which may be important to access and make use of the agricultural information disseminated to them during the OREAP training. This corroborates with the finding of Amasa and Tashikalma (2003) [1] who posited that education has the capacities to influence people's acceptability of new ideas and technology imparted on them through training programs. However, their occupational activities show that 31 percent of the respondents were traders, 19.5 percent were students looking for tertiary schools admission, and 15.0 percent were into farming activities among others. This contradicts the findings of Saburi (2012) [15] that posited that the dominant occupation of the participants in OREAP is farming. About 50% of the youth had personal farm and it is expected that ownership of farm is necessary so as to practice innovation being taught to the participants during the OREAP training. Their mean year of farm experience was 5.5 years with standard deviation of 2.8. This finding reveals that the youths with farming experience of less than 6 years dominates the respondents. This is in agreement with the findings of Muhammad-Lawal *et.al.,* (2009) [9] which revealed that the experiences of youth in farming depend on the skills acquired and their interest. This could however be due to the nature of the programme which is meant specifically for the youths.

Table 1. Distribution of respondents according to their socio-economics characteristics

Characteristics	Frequency	Percentage	Mean ±SD
Age (years)			
20-24	14	12.4	
25-29	56	49.6	
30-34	32	28.3	
35+	11	9.7	
Total	113	100	28.5 ± 4.3
Sex			
Male	71	62.8	
Female	42	37.2	
Total	113	100	
Marital status			
Single	77	68.1	
Married	35	31.0	
Divorced	1	0.9	
Total	113	100	
Number of year spent in school			
7-12	37	32.7	
13+	76	67.3	
Total	113	100	14.3 ± 1.9
Occupation			
Trading	35	31.0	
Student	22	19.5	
Civil servant	2	1.8	
Farming	17	15.0	
Motorcyclist	13	11.5	
Food vendor	1	0.9	
Sales rep	1	0.9	
Printing	1	0.9	
Others	10	8.8	
No occupation	11	9.7	
Total	113	100	
If any personal farm			
Yes	56	49.6	
No	57	51.4	
Total	113	100	
Year of farming experience			
0	2	1.8	
<6	100	88.5	
6-10	9	8.0	
10-20	1	0.9	
20+	1	0.9	
Total	113	100	5.5 ± 2.8

Source: Field survey, 2015

Farm size (in hectares)

Results in Table 2 show that the average farm size of the respondents is 1.8 hectares with standard deviation of 2.2. This indicates more than 50 percent of the respondents have average farm size which may enhance practice of the knowledge imparted on them through the OREAP training. This finding is in contradiction with the finding of Olagunju and Ogunniyi (2006) [11] that majority of the people in South Western Nigeria have relatively small cultivated land areas. The large farm size among the respondents may be attributed to their access to family land for farming. Also, their mean income is N166, 477.0k with standard deviation of N152208.2K while their capital expenses are N58942.2K with standard deviation of N67760.3K. The high capital expenses incurred by majority of the respondents may be due to the kind of farm size (large) they possess.

Table 2. Distribution of respondents by farm size (in hectares), capital expenses (in naira) and income level per year (in naira)

Variable	**Frequency**	**Percentage**	**Average ± SD**
Farm size(in hectares)			1.8 ± 2.2
<1	1	0.9	
1-2.99	43	38.1	
3.00+	69	61.1	
Total	113	100	
Capital expenses(in naira)			N58942.2k ± N67760.3k
<100000	41	36.3	
200000-299999	3	2.7	
300000+	69	61.1	
Total	113	100	
Income level per year(in naira)			N166477.0k ± N152208.2k
<216000	38	33.6	
216000-233999	3	2.7	
234000-251999	1	0.9	
252000+	71	62.9	
Total	113	100	
Source: Field survey, 2015			

Sources of information and the reason for applying for training in OREAP

Data in Table 3 show that about 17.7 percent of the respondents obtained information about OREAP from friends, 3.5 percent of them got to know about the program through relatives, 8.8 percent obtained information through television, 24.8 percent got to know about the program through radio and 45.1 percent of them got to know about OREAP through Osun State Youth Empowerment Scheme (OYES) [13]. This implies that OYES played a vital role in disseminating information about OREAP training in Osun State and very few of the respondents got information about OREAP from relatives and television. This contradicts the findings of Anyanwu *et.al.*, (2002) [1] who had earlier reported that young farmers use more of non-professional interpersonal sources of information such as friend to enhance their involvement in training programs. Also, about 67.3 percent of the respondents applied for training in OREAP to become a well-trained farmer and 32.7 percent applied to obtain empowerment towards eradicating existing vicious cycle of poverty. This finding implies that these two reasons serve as drive for effective participation of youth in the OREAP training.

This in line with findings of Saburi (2012) [15] that most of the participants enrolled for the training in OREAP to become a well-trained farmer.

Factors influencing youth participation in OREAP

The factors influencing youth participation in OREAP are ranked in order of importance in Table 4. In all, youth unemployment and environment were rated highest, followed by interest in agriculture, information availability. From the findings, it can be deduced that the respondents agreed that youth unemployment, environment, interest in agriculture, information availability, availability of incentives, adequate credit facilities provision, availability of capital and inputs are the major factors influencing youth participation in OREAP while they are undecided about friends and family influence as a factor. These factors could be explored in motivating youth towards participation in OREAP training.

Factors limiting youth involvement in OREAP

Data in Table 5 show racking of factors limiting youth involvement in the program, inadequate needed materials was rated the highest, followed by lack of adequate infrastructural support.

Table 3. Distribution of respondents according to Sources of information and the reason for applying for training

Variable	Frequency	Percentage
Through friends	20	17.7
Relatives	4	3.5
Television	10	8.8
Radio	28	24.8
Others	51	45.1
Total	113	100
To be a well- trained farmer	76	67.3
Empowerment against Poverty	37	32.7
Total	113	100

Source: Field survey, 2015

Table 4. Distribution of respondents by the factors influencing their participation in O-REAP

S/N	Factors	Mean	Std. Dev	Rank
1	Youth unemployment	4.27	1.12	1st
2	Environment	4.27	1.31	1st
3	Interest in agriculture	4.14	1.04	3rd
4	Information availability	4.08	1.01	4th
5	Availability of incentives	4.01	1.14	5th
6	Adequate credit facilities provision	3.88	0.94	6th
7	Availability of capital and inputs	3.65	1.03	7th
8	Friends and family influence	3.29	1.12	8th

Source: Field survey, 2015.

Table 5. Table showing factors limiting youth involvement in OREAP

Factors	Mean	Std. Dev	Rank
Leadership style	2.00	1.37	7th
Inadequate trainers	1.93	1.26	8th
Incompetent trainers	1.77	1.20	9th
Inadequate materials services	3.62	0.97	1st
Lack of adequate infrastructural support	3.21	0.99	2nd
Finance	2.19	1.61	3rd
Government insecurity	2.04	1.41	5th
Inaccessibility of training centres	2.12	1.50	4th
Welfare	2.04	1.47	5th

Source: Field survey, 2015.

This implies that Youth involvement in the program will be enhanced if sufficient necessary materials services as well as adequate infrastructural supports are provided for the OREAP training. Also, untimely financial support was ranked third. As declared in training manual of the program, 4,000 naira is to be paid to every participant as allowance specifically to offset transportation cost on monthly basis. This indicates that when the participants are paid on regular basis, this may serve as a motivation for involvement of the youths in the program.

Perception of youth about O-REAP

Data in Table 6 shows youth perception about OREAP training.

Table 6. Table showing respondents' perception about OREAP

Perceptional Statements	A	U	D	Mean score	Remark
It is designed to train youth to become a good farmer	106 (93.8)	6 (5.3)	1 (0.9)	4.59	Agree
It is to train youth to become an entrepreneur	111 (98.2)	1 (0.9)	1 (0.9)	4.65	Agree
It could help reduce unemployment in the state	112 (99.1)	0	1 (0.9)	4.75	Agree
Youth stands to enjoy job to be created by O-REAP	106 (93.8)	6 (5.3)	1 (0.9)	4.14	Agree
The programme will contribute positively to economic status of the beneficiary	107 (94.7)	4 (3.5)	2 (1.8)	4.68	Agree
To boost agricultural produce in the state	110 (97.3)	1 (0.9)	2 (1.8)	4.75	Agree
The benefits from the programme cannot be underestimated	109 (96.4)	2 (1.8)	2 (1.8)	4.75	Agree
The government should continue with the programme	109 (96.4)	1 (0.9)	3 (2.7)	4.72	Agree
Skills and necessary knowledge needed for wealth creation are exposed to the beneficiary of the programme	104 (92)	2 (1.8)	7 (6.2)	4.14	Agree

Source: Field survey, 2015.
Agree >= 4.0, A=Agree, U=undecided, D=Disagree

Figures in parentheses represent percentage. The mean weighted scores of 4 and above were regarded as agreed to the statement. The results show that respondents agreed to all the perceptional statement with OREAP could help reduce unemployment in the state, it could boost agricultural produce in the state and benefits from the programme cannot be underestimated having the highest mean score among others.

Further analysis was done to rate youth perception as negative or positive using the mean perceptional score. Evidence in Figure 1 below shows that more than half (61.9%) of the youth had postive perception of OREAP while 38.1 percent indicated negative.

Test of hypothesis

Hypothesis 1

H_0: There is no significant relationship between the socio-economic characteristics of youths and their perception about OREAP.

Results of Pearson's product moment correlation analysis in Table 7 show that farm size (r = - 0.367; ≤ 0.01) and capital expenses (r= - 0.655; ≤ 0.01) were the socio-economic characteristics that were significantly but negative related with the respondents perceptions The implies that as the respondents' farm size increase, their perception about OREAP decreases by 36.7 percent and as the respondents' capital expenses increase, their perception about OREAP decreases by 65.5 percent.

Table 7. Pearson's product moment correlation analysis between socio-economic characteristics of youth and perception about OREAP

Variables	Correlation coefficient (r)	P-value	Decision
Age	0.108	0.256	NS
Household size	0.048	0.786	NS
Years spent for formale ducation	-0.018	0.846	NS
Farm size	-0.367**	0.01	S
Capital expenses	-0.655**	0.01	S
Income/annum	-0.310*	0.05	S

Source:Field survey, 2015
**Significant at 0.01
*Significant at 0.05.
S = significant, NS = not significant

Results in Table 8 show that occupation (χ^2- value = 7.224; ≤ 0.01) was significant at and source of information (χ^2- value = 4.937; ≤ 0.01) were significance to the perception of youth towards OREAP. Sex, marital status, religion, ethnicity, level of education are the socio –economic characteristics that were not significant. This implies that the better the occupation of the respondents, the higher their perception towards the program; and the more the effectiveness of the information source, the higher their perception towards OREAP.

Table 8. Results of Chi-square showing association between respondents' perception of OREAP and their socio-economic characteristics

Characteristics	χ^2- value	df	P-value	Decision
Sex	0.155	1	0.694	NS
Marital status	0.033	1	0.855	NS
Religion	2.837	1	0.092	NS
Ethnicity	1.637	1	0.201	NS
Level of education	0.748	1	0.387	NS
Occupation	7.224**	1	0.007	S
Source of information	4.937*	1	0.026	S

Source: Field survey, 2015
**Significant at 0.01
*Significant at 0.05.
S = significant
NS = not significant

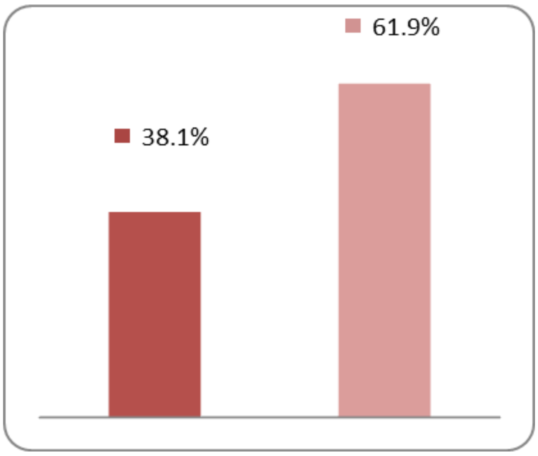

Fig.1. Bar chart showing the percentage distribution of respondents perception about OREAP
Source: Field survey, 2015.

CONCLUSIONS

The study concluded that the objectives of OREAP such as to train youth to become a good farmer and entrepreneur, to boost agricultural produce in the State of Osun was achieved to a reasonable extent in the training conducted in 2013. The participation of the youth in the programme is greatly affected by how conducive the environment of the training centers is. It can be deduced from the study that factors that greatly militate against youth involvement in the programme are inadequate materials services and lack of adequate infrastructural support. It was recommended among others that successive government agricultural development intervention should assist interested participants in accessing financial supports from relevant authority and provide adequate follow-up; and supervision after the training for the participants.

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COMPARATIVE INDICATORS OF SUSTAINABLE TOURISM

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Abstract

As we all know, tourism means one of the most important socio-economic sectors of the world that is in a constantly expansion, which in the second half of the 20th century, recorded an average rate of 4-5% per year. This article aimed to highlight the existence of complexity of the tourism systems, thanks to which there are an infinite number of indicators that can quantify sustainable tourism development. According to the literature review there are quite many authors who have tried to develop such indicators and create some specific theories and methodologies of sustainable tourism. However, regardless the model or method applied the need for estimation and forecasting of tourism activity will remain an essential advantage in adopting strategic decisions in order to maintain the sustainable development of tourism.

Key words: *comparative indicators, eco-sustainability, sustainable tourism*

INTRODUCTION

Due to the complexity of the tourism systems, we can identify theoretically an infinite number of tourism related indicators of which we could get an interesting selection. The defining elements influence a selection of actual indicators working in a particular destination or business include political relevance, approach to sustainability is adopted (weak or strong, minimalist or global, measurable, financial) and other limitations of resources, interests parties involved, the level of public support effective policy, etc. [3].

Details reveal that while the selection process should result in the definition of sustainability adopted, possibly creating a set of indicators may be used in turn to improve this definition. Therefore, the literature helped me to identify the existence of authors who have tried to develop indicators and create theories and methodologies related to sustainable tourism.

Miller (2001) focused on the development of indicators to measure the tourism sustainability [7]. Like other studies related to the physical and human, Miller provides information about several indicators showing all aspects of sustainability, namely: environmental problems (physical and human), employment, leaked financial aspects of satisfaction of needs and customer requirements.

Ko (2004) is another theorist concerned about this topic, offering an alternative of creating a comprehensive methodology to assess the idea of sustainable tourism. Reviewing existing literature, the author mentioned above, argues that "systematic sustainability assessment methods are not used in tourism" [6]. He believes that most studies on sustainable tourism development are descriptive, based on qualitative and subjective in their conclusions without being a rigorous methodology for assessing the tourism eco-sustainability aspects [9].

In this context, the paper aimed to highlight the existence of a complex tourism systems, which has determined an infinite number of indicators allowing to quantify sustainable tourism development.

MATERIALS AND METHODS

Dissemination of research conducted through this article was based on a wide range of statistical information provided by the international literature with European Union vision on the topic discussed. The information was processed through analysis, evaluation, comparison, having a high coefficient of synthetic truth.

The obtained information was systematized through an extensive documentation, with a clear application ensuring proper understanding of the subject under discussion. The research was conducted through the table no. 1 that allows an easy identification of the conclusions which provides arguments for identifying the correlations between the addressed concepts.

This research started from the European Union vision on comparative indicators of sustainable tourism [5].

The list of comparable indicators of sustainable tourism suggested by the union experts focuses on the economic situation. However, the reality is that each of the indicators produces a number of different factors such as: satisfaction of economic, environmental, social, cultural and tourism. All these could provide a very good picture on the sustainability of tourism in the area.

Under such a system colors have the following meaning:

The red zone suggests a critical situation that must be addressed immediately with an appropriate measure or a halt to further tourism development;

The yellow zone suggests a situation bearable, but in the future, should increase substantially the number of tourists. They can also be encountered problems and will require application of preventive measures;

The green zone suggests a sustainable situation that may reflect the success of the measures taken previously of good practice.

According to the literature, in the idea of supporting the mentioned system, we have identified that there are five groups of comparable indicators of sustainable tourism.

1.Economic indicators reflecting the contribution of tourism to the local economy.

Examples of economic indicators:

(i)*The seasonal nature of the change* is an indicator of the economic and environmental implications.

(ii)*The ratio of the number of overnight stays and tourist accommodation capacity* is an indicator of economic turnover achieved at the destination.

(iii)*The coefficient of increase local tourism* summarizes all the influences direct and indirect tourist consumption and employment at their local level because it is a familiar idea that the primary use of tourists induce the whole cycle of consumption still having an favorable effect on the economy as a whole, tourist place and region to which it belongs.

2.Tourist satisfaction based essentially on surveys conducted on tourist destination such as:

(a)Perception of value for money considering the number of repeated visits;

(b)Tourist perception of the quality of tourist facilities, environmental quality (water, traffic congestion, garbage, noise) and cultural/social conditions (general cultural interests of the residents, crime levels).

3. Social indicators refer to social integrity [1] should be judged on the subjective wellbeing of the host population.

Examples of social indicators:

(a)*The share of tourism in local net national product* is an indicator that shows the extent to which local communities gain realized tourism development.

(b)*The percentage of tourists who travel through tour operators* / agencies is a useful indicator of tourism to the local community.

4.Cultural indicators measure the cultural integrity on the diversity, individuality and beauty of cultures and architectural heritage.

Examples of cultural indicators:

(a)*Report of the accommodation capacities and the local population* is an indicator of both cultural influence, in terms of tourist region architectural appearance and request for necessary infrastructure, which the local community budget is burdened [4].

(b)*The intensity of tourism cultural shows and degree of saturation of the local community*. Extremely high level of cultural saturation has a negative effect on the local community, such as the destruction of its cultural identity and lesser quality tourist experience. This indicator can be interpreted as the ratio between the annual number of tourist overnight stays (expressed in thousands) and the number of inhabitants at home (in hundreds).

5.Environmental indicators measure the quality of the environment and the demands made by tourists regarding different environmental media (water, air, biodiversity, landscape, etc.).

Examples environmental indicators:

(a)*The percentage of land where building is permitted*, but is not performed is an indicator of a possible accelerated and uncontrolled development in the next period. This necessitates the need to compare urban spatial plans and maps showing the concentration of constructed objects.

(b)*The use and occupation of land*.

(c)*The percentage of tourists who arrive with their private cars* is an important indicator of potential traffic jam problem parking, noise and air quality in some regions.

(d)*Other environmental status indicators* refer to the use of energy, drinking water consumption, wastewater treatment, solid waste creation which are very hard to collect them at the place or tourist region.

RESULTS AND DISCUSSIONS

According to the study conducted by Ilic (2009) [5] on the European Union's vision of comparative indicators of sustainable tourism in the villages community Kosjeric, Serbia, application of such indicators may be synthesized according to Table 1.

Following the analysis carried out, the social indicators highlighted the low participation of local tourism in the net domestic product. To remedy this situation it is necessary that the number of rural households included in tourist activities to grow.

Regarding the state of the environment indicators, the weaker party is played by most of tourists visiting villages using their private cars. It is known that this is difficult to change, but as a solution, it is necessary that tourists to be converted to public transportation, so their cars are used increasingly less. It must be insisted on this case because it is one of the most harmful effects on the environment (pollution).

The increase of the number of the cars found in the rural areas will adversely affect the ecological environment, and undoubtedly it is the ideal image against peace, green space, attractive landscapes and fresh air in the region under research.

Table 1. The application of sustainable tourism indicators in the villages of Kosjeric, Serbia community

Type of indicator	Indicator	Interpretation
Economical	Seasonality of tourism: % visits in full season (3 months)	76% red zone
	Ratio between nights and tourist beds	11.2 red zone
	Coefficient of local multiplication	-
Tourist satisfaction	Repeated visits:% of tourists visited any village in Kosjeric community more than once	40% yellow zone
Cultural	Ratio between tourists beds and local population	0.032:1 green zone
	Intensity of tourism: Number of nights (000)/Number of local residents	0.01:1 green zone
Social	The participation of tourism in local net product	1.3% red zone
	% of tourist arrivals without services of tour-operators	90% green zone
Ecological	% of land on which tourist building is allowed, but not realized	- Green zone
	Using and occupation of land: % of changes in the extent of building area within 5 years	-
	% tourist visits realized without using a private car	‹10% red zone

Source: Ilic, 2009 [5]

Rural tourism planners and managers focus their activities in the idea of exhibiting alternative means of transport and environmentally suitable. As an example, in some rural areas and protected natural assets in Europe, like national parks, roads are closed to motor traffic, and visitors are encouraged to meet and investigate those special assemblies through cycling.

Developing and promoting an efficient, economical and integrated public transport in the modern world is considered to be the best option for reducing the negative effects of transport on the natural environment. This idea is supported by the fact that cycling and walking, are part of ecological sustainable means of transport, favorable rural areas.

Rural areas are specific in many ways different from other tourist destinations, particularly in urban areas.

It should also be pointed out, that there is a complexity of determining limit values related indicators of sustainable tourism, which I mentioned to the materials and methods, as manifested particularly in tourist destinations weak or underdeveloped confirmed case of rural communities Kosjeric. Tourism here has not been developed to the extent that could cause some disturbance to ecological, social and cultural grave complexity of the procedure for determining the limit values of the indicators is even more pronounced.

CONCLUSIONS

As a first conclusion, it should be noted that "sustainability" means property of a system, where the emphasis is on maintaining a particular state of the system in time [10].

Tourism sustainability is a concept quite complex, because of its latent multi-dimensions and relativity.

Where an indicator describes a specific process control (and not just numeric information), its scope is strictly related to the process.

The approaches proposed so far offer only the existence of partial comparisons or making them (variable to variable or indicator to indicator), because they do not establish any form of global composite-homogenous implementation of their various territories or savings [2]. In addition, most proposals were concentrated on the construction of indicators to assess separately one or more of the various dimensions of sustainability. There has been little progress in designing indicators that integrate its four dimensions [8].

Therefore, regardless the model or methodology, estimation and forecasting of tourism activity will remain an essential advantage in adopting strategic decisions in the idea of sustainable tourism development for a sustainable existence.

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SUBSIDIZING AGRICULTURAL RISKS: TRENDS AND OPPORTUNITIES

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Abstract

The paper analyzed the issue of subsidizing agricultural risks in Moldova. The data were collected from the National Bureau of Statistics of the Republic of Moldova, the Agency for Payments and Intervention for Agriculture, National Commission of Financial Market,insurance companies, and various studies on the topic. The study was based on the following methods: monograph, analysis, synthesis, time series analysis, trend analysis, graphical method, etc. It was concluded that agricultural insurance represents a real mean for crop protection and for the investments made in this sector. Agricultural risk subsidy programs implemented in Moldova so far can be considered inefficient and unattractive for farmers. It requires a radical rethinking of the policy of subsidizing agricultural risks.

Key words**:** *compensation, insurance, risk, subsidies*

INTRODUCTION

For the Republic of Moldova agriculture remains one of the main branches of strategical importance. In many states, the contribution of agriculture to the GDP is about 30%, and about ¾ of the consumer market consists of goods manufactured from raw materials. At the same time, agriculture also contributes to the development of other areas: agricultural products' trade, transportation etc. Agriculture does not involve only the production, processing and food trade.

The development of the agriculture field determines the level of development and vitality of rural communities, living standards of the rural population. The farmers, in addition to the noble activity of providing the people with food, maintain a rural lifestyle. ”If the farms and farmers would not exist, the hamlets and our trade fairs would be extremely affected” [8]. Thus, besides the production and supply of safe food products, affordable, of good quality and in sufficient quantity, the farmers also manage the rural areas in the benefit of the society. But to produce goods in sufficient quantities, they must use agricultural technologies that are not always sustainable. Farmers face a double challenge: on one hand to maintain market competition, and on the other hand – to protect the soil, landscape, biodiversity etc.

Meanwhile, agriculture is a field that it is affected greatly by climatic, economic, political risk factors and others. Farmers do not earn sufficiently for development in sustainable and efficient circumstances. Therefore, the state governments offer them support for the services provided to the society, for their contribution to food security and preserving the vitality of the rural economy [5].

MATERIALS AND METHODS

The study on subsidizing agricultural risks in Moldova is based on materials from the National Bureau of Statistics of the Republic of Moldova, the Agency for Payments and Intervention for Agriculture, the National Commission of Financial Market statistical data of insurance companies, and studies from researchers from European countries. To achieve this study, were applied the following methods: monograph, analysis, synthesis, logical method, time series analysis, trends' analysis, and other methods of processing statistical data.

RESULTS AND DISCUSSIONS

Agriculture is the activity which mostly takes place outdoors. Taking into consideration that destructive natural events are increasingly common, the farmers are more often resorting to insuring plantations and/or animals [4]. In recent years it is noted an increased negative impact of natural disasters on crops. For example, the year 2012 was marked by a very strong drought that caused Moldovan agriculture losses of over 2 billion Lei, the year 2013 was highlighted by heavy rains and hail thunderstorms, and the year 2015 has already been noted by an excessive drought that caused great losses for farmers. International meteorological services and industry scientists predict an increase of the negative effects on different areas of human life, but especially on agriculture.

The analysis of statistical data shows that only 1% of the agricultural producers in Moldova insure their crops and animals, in spite of the fact that agricultural risks are subsidized by the government of the Republic of Moldova. The subsidies amount for insurance is 60% for insuring multiannual plantations, sugar beet and vegetables, and 50% for ensuring other crops and animals [2].

Subsidized insurance in agriculture is accomplished in accordance with the provisions of Law nr.243-XV from 08.07.2004 „Regarding subsidized insurance of production risks in agriculture” [6], according to which subsidizing insurance premiums are awarded to the agricultural producers that have registered at the town hall the crops, animals, birds, bees families and fish that belong to them and the ones that maintain the agricultural crops, animals, birds, bees families and that produce fish according to approved technologies, take disease prevention measures and control pest attacks, and keep records of the performed works.

The subsidizing of agricultural producers from the Republic of Moldova according to the act ”Boosting subsidizing production risks in agriculture” during 2011-2014 is presented in Table 1.

The data from Table 1 show a decrease in the number of contracts compared to 2011, but a decrease in the amounts of paid compensation, although given the fact that 2013 was not favorable to farmers (with strong floods and hail).

Table 1. Boosting subsidizing production risks in agriculture during 2011-2014

Year	Contracts approved for compensa-tion	The amount of damages payable, thousands Lei	Total subsidies to agricul-ture	Total weight measure subsidies, %
2011	164	14.61	215.4	6.78
2012	266	27.81	399.8	6.95
2013	78	41.29	455	9.07
2014	107	29.36	564.7	5.20

Source: Adjusted by the authors based on data from CNPF: www.cnpf.md

Compared to the year 2014, the share of subsidies awarded for risk insurance has decreased from 9.1% to 5.2%, a fact due to the refusal of insurance companies to insure these types of risks.

The means provided for this action are used for subsidizing the insurance premiums of the agricultural producers, based on production risks insurance in agriculture contracts and based on the List of risks for which the insurance is subsidized from the insurance fund of agricultural producers premiums in cultivation, horticulture, viticulture, and livestock breeding (storms, hail storms, excessive drought) and the List of crops, livestock and poultry species for which the insurance is financed from the subsidizing premiums fund of the agricultural producers (sugar beet, sunflower, maize, etc.).

In 2013 only 4 insurance companies have conducted business in the field of subsidized insurance of production risks in agriculture, 221 contracts being signed for subsidized insurance of production risks in agriculture with the amount of 12,322.4 thousands lei paid (Table 2).

In 2014, the amount authorized for compensating farmers affected by agricultural risks was increased 2 times, up to about 29.4 million Lei, and the number of signed contracts has increased insignificantly.

The cumulative value of gross premiums in 2013 amounted up to 91.0 million Lei, registering a 16.5 million Lei increase compared to the value recorded in the previous year.

Table 2. Boosting the mechanism of risk insurance in agriculture

Insurance company	The number of beneficiaries		The amount requested, thousands Lei		The amount authorized, thousands Lei	
	2013	**2014**	**2013**	**2014**	**2013**	**2014**
Moldcargo	89	93	5,043.58	5,022.6	5,043.58	4,887.55
Garanție	62	55	3,868.88	2,493.86	3,789.51	2,243.10
Klassika Asigrurări	11	16	270.84	196.81	270.84	196.81
Moldasig	59	52	3,225.73	23,359.63	3,218.43	21,435.97
Asterra Grup		8		306.99		306.99
Galas		1		146.02		146.02
Acord Grup		4		158.88		146.28
TOTAL	**221**	**229**	**12,409.0**	**31,684.8**	**12,322.4**	**29,362.72**

Source: [1]

The subsidies allocated to the payment of insurance premiums have amounted 54.5 million, or 11.8 million Lei more compared to 2012, registering an increase of the agricultural producers' interest in this type of insurance.

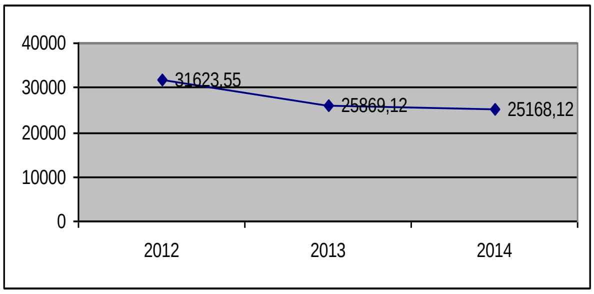

Fig. 1. The evolution of insured agricultural areas in the Republic of Moldova during 2012-2014
Source: Adjusted by the authors based on data from AIPA:[2]

Meanwhile, the potential of agricultural insurances in the Republic of Moldova remains unexploited, insured areas being only 3.3% of the total agricultural areas (Fig.1). Insurance compensations have amounted 27.4 million Lei and have decreased by 3.6 times compared to the previous year. The evolution of gross awarded premiums and compensations paid to farmers during 2008-2014 is presented in Fig. 2.

The data presented in figure no. 2 shows that the paid compensations have exceeded the subscribed premiums only in 2012.

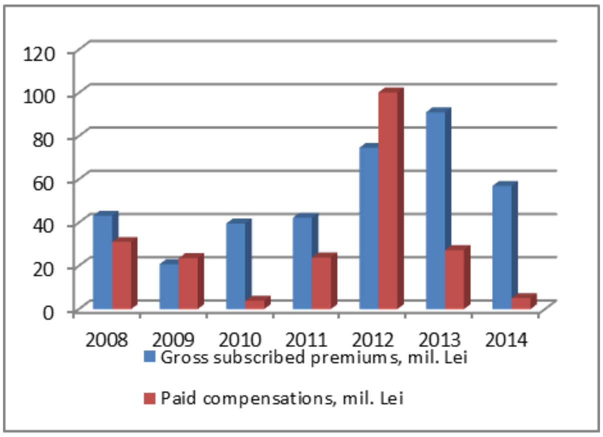

Fig. 2. Gross subscribed premiums and paid compensations for subsidized insurance of productions risks in agriculture during 2008-2014, Million Lei

In the other years of the studied timeframe, the insurance companies have paid amounts much lower compared to the premiums collected from agricultural risks insurance. Such a situation can be observed in the past 2 years as well. In 2014 the paid damages were less than 10% of the premiums.

The most common insured risks by the agricultural producers are the ones caused by hail, excessive drought and winter frosts.

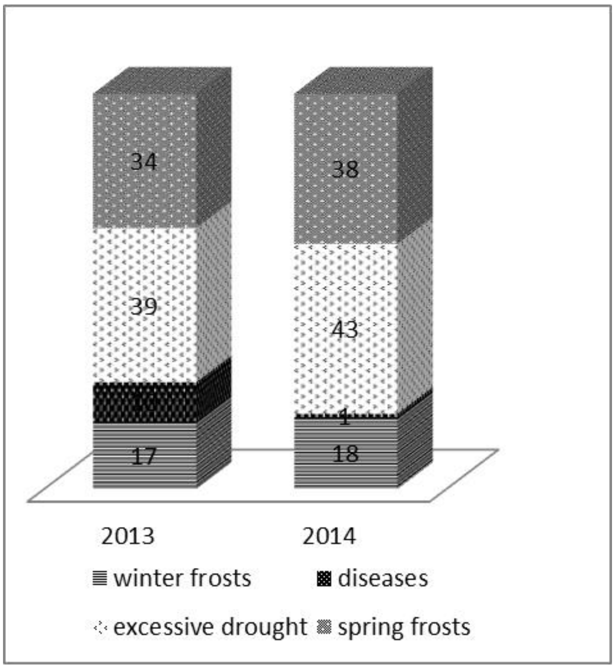

Fig. 3. The most frequent agricultural risks insured by farmers
Source: Adjusted by the authors based on data from NCFM: [1]

The structure of insured risks in 2014 compared to 2013, presented in figure 3, reveals the following data [1]:

-for the risk „hail" the insurance premium subscribed amounts 22.9 million Lei, and the damages paid – 2.2 million Lei, the compensation rate being 9.6%;

-for the risk „winter frosts" the insurance premium amounts 10.1 million Lei, and the paid damages – 1.8 million Lei, the compensation rate being 17.8%;

-for the risk „spring frosts" the insurance premium amounts 6.8 million Lei, the paid damages - 0;

-for the risk „excessive drought" the insurance premium subscribed amounts 12.9 million Lei, and the paid damages – 1.5 million Lei, the compensation rate being 11.6%;

-for the risks included in the category „others" the insurance premium subscribed amounts 5.6 million Lei, and the paid damages – 3.6 million Lei, the compensation rate being 34.6%.

Regarding insured crops, the largest share by volume of paid premiums hold the fruit orchards, followed by grapes and sunflower. The share of premiums paid to insure the above mentioned crops consists 97.1% of the total insurance premiums subsidized in agriculture. However, the largest amount of damages for insured crops was awarded to orchard owners, followed by sugar beet producers and the ones who have insured their grapes' growth. The share of compensation for these crops in the total compensation paid to risks in agriculture is 91.4%.

CONCLUSIONS

Agricultural producers' subsidies are part of the financial framework aimed at accomplishing agricultural policies at national level. Thus, subsidized insurance of agricultural risks, should contribute to capitalization, increase competitiveness in the agricultural field and liaise between them and rural development: employment of the population, maintain and support farm incomes and their transition to the category of producing farms, developing micro and small businesses in the rural area, the migration of the population.

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TRENDS IN THE PRICE OF AGRICULTURAL INPUTS AND PRODUCTS AND THE PHENOMENON OF "PRICE SCISSORS" IN REPUBLIC OF MOLDOVA

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Abstract

The paper aimed to present a comparative approach of price indices development in agriculture and price variation in ressources and services purchasement by agricultural producers. Based on the analysis of price development report "industry - agriculture," the author gives an appreciation of the phenomenon of "price scissors" for the period 2005-2014. The data sources are the studies from the issue of the National Bureau of Statistics of the Republic of Moldova. The data were processed with the following methods: monograph, analysis, synthesis, trend analysis, graphical method, etc. It was concluded that the state should support a manufacturer's target price. The target price of the manufacturer supported by the state should provide producers a profit above the average in economy. Such an approach to the subsidization of agriculture will provide an increased reproduction without excessive expenses, will reduce the risk of overproduction due to excessive subsidies, and at the same time entities will have an incentive to increase the efficient use of assets.

Key words**:** *price scissors, price indices, disparity of prices*

INTRODUCTION

In the Republic of Moldova the contribution of agriculture to the national economy is relatively high. The largest part of the population's income is used for food and essential services, therefore the change of prices has major implications on various socio-economic aspects, including the development of the agricultural sector [3]. It is known that the food market is characterized by a weak correlation between demand and price. Food demand is not sensitive to changes in consumers' income, or the decrease of prices. The agricultural market is characterized by a relatively low level of concentration. Therefore, prices have regular recessions, and the manufacturers cannot coordinate their activities to affect product offerings. In addition to the specific characteristics of agricultural production, with cyclical and seasonal fluctuations in production, dependent on the weather conditions, it leads agricultural production away from the action of the market mechanism in terms of supply adjustment. All of the above create disparities in the field of prices and agricultural inputs.

MATERIALS AND METHODS

Republic of Moldova's adherence to the World Trade Organization, under the limited possibilities of the state to support agriculture, has updated the task to improve the competitiveness of agricultural producers on domestic and foreign markets. The global level of prices for food products has increased highly in the last decade. Thus, the food price index calculated by FAO (Food and Agriculture Organization) reveals an unprecedented growth in the aggregate level of food prices [2].

The information base used to create this study consists of data from the National Bureau of Statistics of the Republic of Moldova, FAO statistics, researchers' studies on the analyzed problem. The materials were processed by applying the following methods: monograph; comparison, analysis, synthesis, the graphical method, the indices' method, etc.

RESULTS AND DISCUSSIONS

Price disparity is one of the main causes that hinder the development of Republic of Moldova's agricultural sector.

The price parity issue in agriculture is discussed in detail in the works of researchers around the world, especially the mechanism and cause of the price disparity phenomenon.

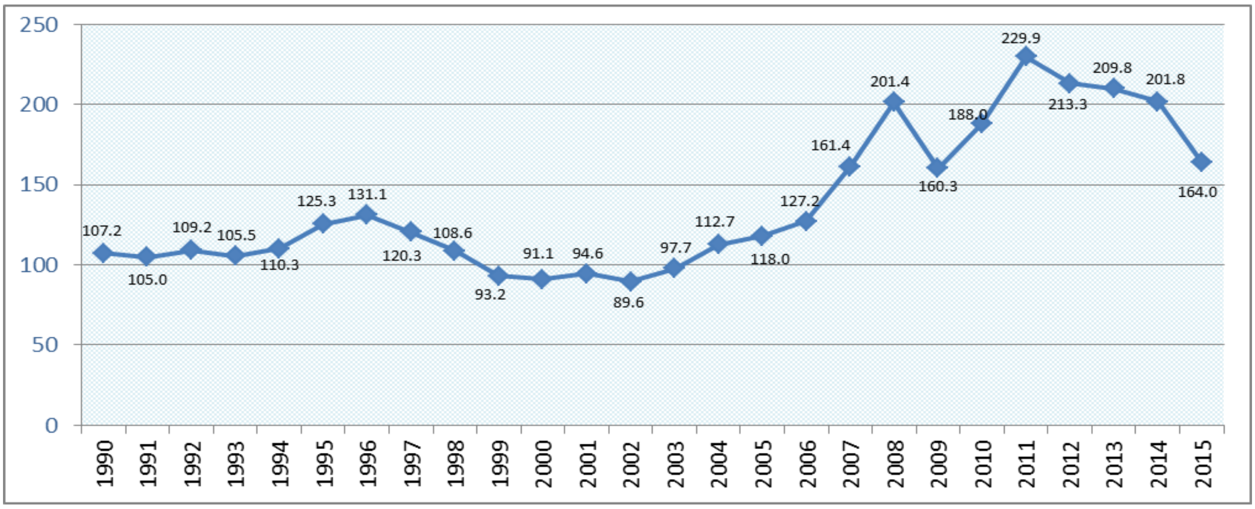

Fig. 1. The development of the food price index calculated by FAO during 1990 – 2015
Source: prepared by the author based on statistical data of FAO // www.fao.org

In particular, there are assessed the farmers' losses arising from disparities between agricultural products' prices at the producer and their consumer prices [5, 6].

The development trend of the food price index is increasing and is highlighted starting with 2007, reaching the highest level in 2011. The analysis of the evolution of prices at the global level, since 2007 shows increases for all groups of agricultural products used as base for analysis - grains, sugar, oil. The largest price increases were recorded for sugar.

To this increase have reacted the domestic prices. In spite of this, the income of farmers in developing countries does not increase proportionately with the increase of world prices. The pressure from intermediaries in the trade business, but also from those in the agricultural raw materials processing industry has led to a significant reduction in the share of the manufacturer price in the retail price of the final product of agricultural origin.

The price disparities at the expense of agricultural producers can be also noted in the economy of other countries. The experience of the farmers in countries with a developed economy shows that to execute agricultural functions and ensure balanced growth, it is necessary to ensure the mutually supported development of science, industry and agriculture.

Between the development of science, industry and agriculture there is a direct dependence. Both science and industry, through innovative means and technologies, provide superior capitalization of the agricultural production, this being the promoter of the technological modernization of agriculture. Between the manufacturing industry and agriculture there are direct dependence relations, but also relations of mutual influence and conditionality. The level of development and the diversity of manufacturing industries depend directly on the volume and range of raw materials provided by the agricultural sector.

A serious problem for agricultural producers is the disparity of prices that occurs between agricultural products and goods and services purchased by agricultural units, and also between the producers' sale prices and those charged in the retail network.

The interrelationships between industry and agriculture are reflected in the ratio between industry and agriculture prices. The tracking relationship of the price ratio industry-agriculture progress is calculated by "price scissors" or by determining the quantity of agricultural products needed to be sold in order to buy an industrial product or a service unit needed for agriculture.

The function of agricultural products provider for the populations’ consumption in the named country

A stimulus for the industrial development and economic growth. The market for the industry of manufacturing production goods

The function of raw materials supplier for manufacturing industries

The function of ensuring the revenue in the central and local budgets through the tax system, other categories of breakdowns

The function of setting up foreign currency resources by exporting surpluses of agricultural products, contributes to the foreign currency entering the

The social function manifests by providing jobs and contributes to the development of rural areas

Ecological function. Sustainable agriculture contributes to the environmental restoration and maintenance

The function to create state savings of agricultural products etc.

Fig. 2. The functions of agriculture
Source: elaborated by author.

The capitalization prices of agricultural products include a lower share of net profits than the prices of industrial products. This phenomenon is called economic *disparity of prices*, which at the moment represents a vital matter for agricultural producers, because the price disparity between agricultural and industrial products procured by them maintains. [4, page 58].

The evolution of industrial goods and services’ prices purchased by farmers has a decisive influence on the profitability of an agricultural enterprise, its ability to create value. The level of high prices of industrial inputs and services used diminishes the resources available to develop agricultural entities.

The analysis from Fig. 3 reflects a growing trend of price indices of both agricultural products, as well as the services and goods purchased by farmers in the past 10 years.

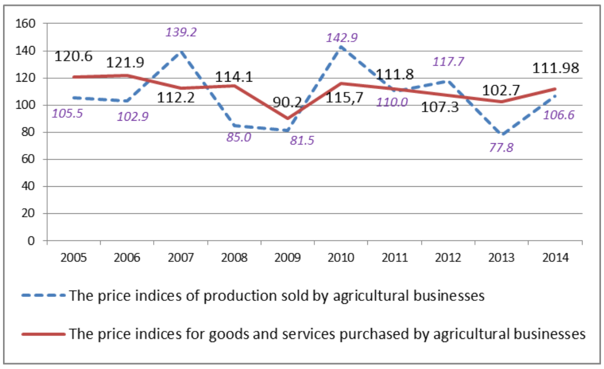

Fig. 3. The price indices for agricultural products, goods and services purchased by economic entities, in % compared to the previous year, 2001 = 100 p.p.
Source: elaborated by the author based on data B.N.S. / www.statistica.md

The average annual index of increase in prices of agricultural production is 4.31%, while the prices for services and industrial goods purchased by agricultural producers increase yearly in average by 10.38%. It manifests therefore the so called phenomenon "price scissors", which affects to certain extent the agricultural producers.

There were calculated average rate of growth for eight years in Table 1. Calculations show that the average rate of prices’ increase for goods and services purchased by agricultural producers in Republic of Moldova is of 7.47% annually.

For comparison, the average annual increase in prices of agricultural products sold by agricultural producers for the same time period was of only 0.87%. The largest increase is observed in the prices of current assets of first necessity in agriculture: fertilizers and energy (lubricants, electricity etc.)

Thus, the highest annual average growth in purchase prices in the period of 2008-2015 is registered for mineral fertilizers and amounted to 10.54%.

During 2008-2015 the prices for petroleum products and other energy resources purchased by farmers for carrying out agricultural works has increased annually by an average amount of about 6.50%. Tariffs on services purchased by agricultural enterprises have increased by 8.79% annually.

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Table 1. The price indices of goods and services purchased by agricultural businesses (in % compared to the previous year)

Agricultural inputs	**Years**								**The Average Annual Growth Rate**
	2008	2009	2010	2011	2012	2013	2014	2015	
Goods and services - total	**114.1**	**90.2**	**115.7**	**111.8**	**107.3**	**102.7**	**111.98**	**108.9**	**107.47**
from which:									
Industrial goods	***115.2***	***87.0***	***118.1***	***111.0***	***106.1***	***102.6***	***110.74***	***107.9***	***106.86***
including: Agricultural machines and equipment for plant growing	107.3	103.9	105.2	102.2	108.2	107.9	109.89	113.2	107.17
Machines for livestock breeding	108.3	107.8	102.0	100.0	104.4	104.1	104.72	94.8	103.13
Machines and equipment for the gathering and preparation of fodder	102.3	101.0	106.5	100.0	106.7	107.9	108.77	111.4	105.50
Tractors	115.3	104.6	107.6	106.5	104.0	107.6	107.89	112.8	108.23
Mineral fertilizers	130.7	86.7	117.5	119,5	109.2	108.1	108.07	109.8	110.54
Chemical means for plant protection	100.5	110.6	112.7	105.3	105.2	107.4	116.13	117.9	109.32
Lubricants, fuel and electricity	122.9	74.7	125.6	120.2	104.3	102.5	113.16	98.7	106.50
Construction materials	102.6	102.2	104.4	111.5	108.5	110.5	109.57	108.6	107.17
Seeds and seedlings	107.8	101.9	110.9	114.7	109.8	112.8	126.51	113.9	112.10
Services provided to agricultural businesses including:	***112.3***	***98.4***	***104.9***	***116.1***	***114.3***	***111.1***	***106.90***	***107.4***	***108.79***
Agrochemical services provided to agricultural businesses	116.2	95.4	102.5	114.5	100.3	106.9	110.59	106.6	106.41
Repair and maintenance of agricultural machines and vehicles	107.6	90.3	108.7	127.5	127.8	118.3	105.18	99.6	109.93

Source: www.statistica.md [7]

A visible difference is observed between prices of agricultural products from the manufacturer and consumer goods (the price paid by the final consumer).

Therefore, the added value of links that do not produce is very high.

For example, for eggs sold directly from the manufacturer in the trade network, the added value is between 50 and 75%.

For other products that pass through the processing and trading process, the gap is even greater. Such a situation can be seen in products of plant origin, where the gap between producer prices and the trade network is even greater.

Basically the consumer pays a price 3-4 times higher than the price at which farmers sell their products on the market [1].

The existence and maintenance of price disparity leads to unfavourable economic consequences and the price mechanism plays a reduced market regulation role. In agriculture, the tendencies to monopolize the market are basically excluded due to the relatively low concentration of production and the industry branches supplying agriculture with the necessary material and energy resources, also the ones which purchase raw materials from agricultural producers (the food industry and trade sector can be in a position of oligopoly, or even monopoly).

This creates the disparity in price. Therefore appears the necessity to counter this phenomenon by coordinating the actions of small producers and compensation of adverse variations in prices by the intervention of governmental structures. State regulation of supply, prices and incomes in agriculture should prevent market failures, overproduction, mitigate price fluctuations, compensate the decline in income as a result of these variations and the implementation of organizational functions, due to the relatively low concentrations of production in agriculture, but in no case should not interfere in ongoing systemic restructuring of the relationship between prices.

A price is considered at equal if it allows agricultural businesses to gain an average profit, the costs of which are at the required level for development under normal conditions [4].

“Profit is a key criteria of the economic activity, setting unrealistic costs or setting them incorrectly, generates false signals about what is profitable and what is not” [5].

Therefore, the state should support a manufacturer's target price. The target price of the manufacturer supported by the state should provide producers a profit above the average in economy.

Such an approach to the subsidization of agriculture will provide an increased reproduction without excessive expenses, will reduce the risk of overproduction due to excessive subsidies, and at the same time entities will have an incentive to increase the efficient use of assets.

Under these unfair conditions for farmers, there is a continuing disinvestment in the agricultural sector. Investments do not have a favorable effect on the development of this sector, because revenues do not allow returning the investments that were made. These effects discourage farmers to develop their business, and young people are not tempted to work in this field.

Price discouraging in the agricultural sector has negative consequences for the countryside. Young families, who are daily facing these issues, emigrate either to urban places or abroad in search of a stable source of income.

CONCLUSIONS

The level of concentration achieved in the industry sector of processing agricultural production and in the retail one disadvantage agricultural producers very much.

In these circumstances, the state has the role of organization and regulation of the agricultural products in order to ensure agricultural producers enough profit for increased reproduction.

At the same time, the state’s support must avoid overproduction and create an incentive for a more efficient exploitation of the production potential.

Agricultural producers’ reduced incomes due to the parity relations’ drift must be compensated by determining the level of the target price in accordance with economic and sustainable grounds for the development of agriculture.

The disparity of prices, the prices charged by processors of agricultural products and cartel prices established by trade companies in the field of oil products, mineral fertilizers and chemicals for destruction of pests and diseases are the main factors that adversely affect the agricultural sector in Republic of Moldova.

Solving these problems requires tactical and strategic measures from authorities. According to the author, the problem could be partly solved by a sufficient subsidy of this sector. At present, the system of subsidizing agricultural sector has no favorable effects on its development.

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STUDY OF THE INFLUENCE OF THE FODDER, CULTIVATED WITH THE USE OF ORGANIC AND MINERAL FERTILIZERS, ON THE BODY MASS OF RABBITS

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Abstract:
In the article is reflected the assessmnet of the influence of feed grown with fund of organic and mineral fertilizer on the physiological development (body mass gain) of rabbits. For this purpose forage crops (corn, alfalfa, fodder beet), grown with the use of organic fertilizers and minerals, were used in the food ration of rabbits. To resolve the expected objective it was organized an experiment with three lots of rabbits analogues in terms of body weight: a control lot and two - experimental. In the food ration of rabbits in the first, second and third lots were used respectively, forage crops grown with natural background (lot I), with the fund of organic fertilizer (lot II) and mineral fertilizer (lot III). Analyzing the obtained results it was found, that the body weight gain of rabbits that used in the food ration forage cultivated with natural background, worm compost and ammonium nitrate was respectively with 166.59%, 184.80% and 146.60 % higher enhanced than that from the start of the experiment. Daily weight gain of rabbits in lot II overtook with 10.59% and that of the animals in lot III has decreased with 12.30% compared with that of animals in the control lot. Thus, it was established the influence of forage plants cultivated with the use of organic and mineral fertilizer on the body weight gain of rabbits.

Key words: *body weight, fodder, mineral fertilizer, organic fertilizer, rabbits*

INTRODUCTION

Ecological agriculture promotes the sustainable production systems, diversified and balanced in order to prevent pollution of harvest and environment. Ecological production regarding crop production without the use of harmful traditional products, knows a special concern for decades in economically developed countries. The interest for the products and organic production is growing. The system of ecological (organic) agriculture has as theoretical basis the full use of natural soil fertility and the factors which favors [14].

Organic farming is an alternative to the traditional system of agriculture that ensures sustainable development of the sector. The process of transition from conventional agriculture to that of organic does not represent a short action. This transition is gradual, by going through a transitional period, called "conversion period". One of manifestation of organic agriculture consists in gradually decreasing of quantities of mineral fertilizers (chemical) and the extensive use of those organic obtained by traditional composting or using various methods of bioconversion of organic waste biodegradable of diverse origin [4].

The presence of significant amounts of manure that can be used as organic fertilizer, determined the researchers to elaborate a comprehensive system of measures to improve the ecological situation in the republic, including measures to ensure the veterinary, zoo hygienic and epidemiological welfare [3].

One of the measures that can solve these problems of the environment in order to ensure human and animal health is the implementation of bioconversion technology (processing) biodegradable organic waste (of diverse origin). For this purpose, in some countries (Italy, the Netherlands, Germany, Romania, Estonia, Ukraine, Russia, Bulgaria, Slovakia, Hungary Japan, a.) is practiced widely the technology of bioconversion of organic waste by worm cultivation. In the result of the use of this technology is obtained worm compost organic fertilizer ecologically efficient, which possesses increased biological activity [9; 11].

According to the obtained results, it was found that a proprietary characteristic of worm compost is the increased content of organic matter, which constitutes 22.00% - 30.00%, and also in its composition is presented beneficial microorganisms, nitrogen, enzymes, micro- and macro-elements. The ingoing amount of worm compost in soil is 10 times lower than that of conventional composting (regular) having a long-acting (3-4 years) [3].

It was found that worm compost used as organic fertilizer reduces the accumulation of nitrous-compounds in plants, increases plant resistance to the attack of phytopathogenic agents and to unfavorable climatic conditions, improves product quality and increases crop yields [2, 5].

The continuous development of the zootechnic sector, the increase of productivity and quality of livestock products directly depends on the creation of fodder with high biological value and high nutritive created as a result of the implementation of the efficient technologies for the production of quality forage used in feed ration of animals [1].

Ensuring the health of animals and of food security is the reduce of the amount of toxic chemicals in their food ration. It is known that from the group of the toxic substances take part and nitrosocompounds (nitrates and nitrites). Nitrates from feed can be converted by the rumen bacteria into nitrite, which are toxic through methemoglobin formation or by blocking the enzyme activity resulting, for example the symptom of deficiency in vitamin A, even if the intake of carotene is normal. High content of nitrates in plants is directly influenced application as fertilizer of nitrogen fertilizer at the beginning of the growing season and before harvesting. A special role in the accumulation of nitrates in plants belong to the following factors: insufficient light, low temperature, increased acidity of soil and insufficiency in it of molybdenum, cobalt and sulfur and failure to comply technological elements for collecting and storing fodder [10]. As a result of multiple investigations it was found that nitrosocompounds accumulation in crops grown with worm compost fund is lower than in those fertilized with mineral fertilizers, plant thus improving the quality [6].

Scientific novelty of the study consisted in examining the possibility of application of worm compost in the process of obtaining ecological forage crops. Studies also have focused on getting qualitative feed with the use of various fertilizers and the assessment of their influence on the body weight of rabbits. Feeding rabbits is one of the main factors by which the grower can act for the achieve of higher performance of production and for high economic efficiency. These results are obtained using feed which contain nutrients necessary for life processes in the body (proteins, fats, minerals, vitamins, carbohydrates, cellulose and water) [7] and do not contain toxic substances, the content of which exceed the maximum permissible concentration (MPC) [10].

Basic nutrition for rabbits is dry hay. Because rabbits have a digestive system quite complicated, the hay is needed to be of a very good quality. A good hay which is administered to rabbits must have green color, must smell good and be well dried.

The rabbits in winter need and juicy fodder, so in this period is welcomed fodder beet administration [8].

Proceeding from the above, the objectives of the conducted research consisted in the use of the technology of organic waste by worm cultivation in order: complete bioconversion of organic biodegradable waste; obtaining ecological organic fertilizer, long-acting; improving and reanimation soil fertility; improving the quality of forage crops and increasing the body mass of animals.

MATERIALS AND METHODS

In order to obtain worm compost, in Experimental Section of Scientific and Practical Institute of Biotechnologies in Animal Husbandry and Veterinary Medicine it was organized under production conditions, the process of the bioconversion of the organic waste by worm cultivation in three sectors, which have undergone processing about 50 tons of organic waste. In the obtained worm compost, before being incorporation in soil, some indicators were determined as: active acidity (pH), organic matter, and total nitrogen content of potassium, phosphorus, magnesium, and humus.

In order to obtain forage crops subsequently used in ration of rabbits, it was organized experiment in field conditions in which were included three types of forage crops: alfalfa varieties „Tuna" fodder beet variety „Ekkendorfskaya" and maize varieties „M-450". Surface lots amounted to 2 acres. For each fodder crop were used three lots: one control and two experimental. For lot I was kept natural background, lot II was fertilized with worm compost (from considerations 4ton/ ha), and the third lot - ammonium nitrate (285 kg/ha). Before the incorporation of fertilizers in the soil, was performed the soil preparation (autumn - tilling to a depth of 30-40 cm and spring – loosening (by harrowing). Fertilization was carried out in early spring, immediately after snow melting on the autumn plowing. After harvesting of the forage crops in alfalfa hay the vegetable part (stems and leaves) and corn crops stern of fodder beet, was carried out the determination of some quality indicators in accordance with the usual methods [12; 13].

Subsequently, according to the scheme of the experiment (Table 1) the obtained feed were used as an addition to food ration of the rabbits.

In order to assess the influence of feed grown with organic fertilizer fund (worm compost) and mineral fertilizer (ammonium nitrate) on the development of physiological (body weight gain) of rabbits in the organized experiment were included 3 lots of rabbits. In each lot there were selected 5 rabbits, according to the principle of analogues with regard to body weight. In ration feeding of rabbits were included forage crops: alfalfa (hay), corn (grain) and fodder beet (crops stern), cultivated with natural background (without fertilizer), with worm compost fund and ammonium nitrate.

Initially, during the three weeks rabbits in all groups were subjected to preparatory period, they received the same ration (mixed fodder and water) of food. According to the scheme of the experiment at the basic rate of rabbits in the control lot were included hay of alfalfa, corn grains and fodder beet grown with natural fund.

Table 1. The experimental scheme

Lot number	**Number of animals**	**Experimental conditions**	**Research during the experiment**
I-Control	5	The basic rate and fodder from the lot with natural fund	It was determined: a) the content of nitrates in forages; b) the increase of the body mass daily, monthly and total.
II-Exp.	5	The basic rate and fodder from the lot with fund of worm compost	
III-Exp.	5	The basic rate and fodder from the lot with fund of ammonium nitrate	

For rabbits in experimental lots II and III, at the base rate were added, feed analogous to those of control lot cultivated respectively with the fund of worm compost and ammonium nitrate. Duration of the experiment constituted 5 months. During the experiment, monthly and at its end, by weighing was determined daily gain, monthly and total increase body mass and of rabbits.

RESULTS AND DISCUSSIONS

Assessing the amount of nitrates from feed (hay of alfalfa, beet and maize grain) used in food ration of rabbits it was carried out before the start of the experiment and during the implementation of it. The investigation results are shown in Table 2. Analyzing the obtained results it was found that in forage samples the amount of nitrates the nitrate content was varied, in some cases, exceeding the maximum permissible concentration (MPC), which for roughage is 500 mg/kg and for fodder beet - 800 mg/kg. The amount of nitrates depended on half collection phase of vegetation and type of fertilizer used in the cultivation of forage crops.

Table 2. The content of nitrates in forage samples used in food ration of the rabbits

No.	**Types of forage crops**	**Variants of the experiment, the value minimum and maximum of nitrate content, (mg/kg)**		
		Control	Worm compost	Ammoniu nitrate
1	Alfalfa hay	129.00±1.10 - 178.00±0.97	200.50±0.86 - 207.0±0.09	457.00±1.74 - 550.00±1.15
2	Fodder beet	283.50±0.66 - 583.50±6.19	376.00 ±7.07 - 631.00±1.11	719.00±2.11 - 919.0 ± 5.31
3	Maize (stalks and the leaves)	157.80±0.53 - 257.8±0.42	250.7±0.46 - 302.00±0.81	926.4±0. 46 - 1113.00±5.11
4	Maize (grains)	traces of nitrates	traces of nitrates	traces of nitrates

In all phases of vegetation of forage crops grown with substance of ammonium nitrate was found a high content of nitrates. In samples of food (in the last phase of vegetation) ready to be included in the ration of diet of rabbits, the amount of nitrates ascertained in hay from alfalfa, beet stems and leaves dry corn and in beans of it collected on lots with ammonium nitrate fund, surpassed that of control lot, respectively from 3.09 to 3.54 times, 1.58-2.54 times and 4.32-5.87 times. The feed used in the food ration of rabbits the amount of nitrates exceeded the maximum permissible concentration by 10.00% (in hay from alfalfa), 14.88% (in fodder beet) and 85.28% -122.60% (the stalks and leaves of corn). In the maize grains nitrates were not detected.

In fodder collected on lot with fund of worm compost this indicator exceed for 1.16-1.55 times (hay), 1.08-1.33 times (fodder beet) and 1.17-1.59 times (maize) that from plants of control lot, but did not exceed the maximum permissible concentration.

In the alimentation of rabbits during the experiment, to the basic ration were added fodder grown with organic fertilizer fund (worm compost) and mineral fertilizer (ammonium nitrate). Thus it was determined the influence of fodder fertilized with worm compost and ammonium nitrate on the daily average, monthly and final of the body mass at rabbits.

Analyzing the results of monthly growth of body mass of the rabbits (Table 3), it was found that the growth is more evident after one month from the start for the experiment animals in lot II, at which the monthly gain was 0.718 kg and the smallest increase of the body mass was manifested at animals from lot III - experimental.

Table 3. Rabbits body weight during the experimental period

No.	**The period of weighing**	**Lot and body weight, (kg)**		
		I –control	II-experimental	III- experimental
1	Initial	1.326±0.09	1.322±0.09	1.322±0.04
2	After a month	2.020±0.46	2.040±0.76	2.000±0.40
3	After two months	2.396±0.12	2.596±0.12	2.380±0.09
4	After three months	2.808±0.12	3.036±0.12	2.748±0.12
5	After four months	3.090±0.11	3.310±0.22	2.994±0.11*
6	The end of the experi ment	3.535±0.30	3.765±0.12	3.260±0.17*

Note: 3.260±0.12* - authentic data

At rabbits in this lot, the increase of body mass constituted 0.678 kg. The increase of body mass of the animals in lot II - experimental exceeded it by 3.46% that of the animals in the control lot and by 5.90% that of the animals in lot III - experimental. In lot in which in animals food ration were included fertilized fodder with ammonium nitrate the increase of body weight decreased with 2.01%

of that animals from the control lot and with 5.57% of that of animals in which were used fodders fertilized with worm compost.

After two months from the beginning of the experiment, the body weight gain of the animals from the lot in which were used fertilized fodders with worm compost, those exceeded that of the animals in the control lot, with 47.87%, while that of animals of lot III - experimental - with 46.32%. In comparison with the body weight gain of animals, the animals in control lot, that of animals from lot III - experimental, increased insignificantly. This increase was only 1.06%.

After three months from the beginning of the experiment it was found a similar situation to the previous month. The increase of body mass of the animals in lot II - experimental overtook that of animals in the control lot with 6.80% and that of animals of lot III - experimental with 19.57%. Comparing the growth of body mass of the animals in lot III – experimental, in food ration to which were included fodder collected from the lot fertilized with ammonium nitrate with that of animals in the control lot, it was found that it decreased 10.68%.

In the fourth month of the deployment of the experiment, the increase of the body mass of animals in lots II and III - experimental decreased respectively with 2.84% and 12.73% on that of animals in the control lot. Increase of the body mass of the animals in lot II - experimental overtook that of animals in experimental lot III with 11.38%.

At the end of the experiment (after 5 months) the increase of the body mass of rabbits in lot II - experimental exceeded with 2.23%, while those in lot III - experimental decreased with 40.22% in comparison with the increase of body mass in control lot. The increase of the body mass of the animals in lot II, in which were used fodders cultivated with the fund of worm compost exceeded it with 71.05% that of rabbits in lot, in which were used fodder fertilize with ammonium nitrate.

Analyzing the results obtained during the experiment it can be concluded that the fodder cultivated with fund of worm compost influenced beneficially, similar to that of fodder obtained from the control lot, on the gain of the body mass of rabbits (with the exception of the period of 4 months) and those cultivated with the ammonium nitrate fund had a negative influence, essentially lowering the monthly increase body mass of animals.

Results are displayed in Table 4 total gain of body mass of rabbits at the end of the experiment and its daily gain during the experiment.

Table 4. Increase of body weight of the rabbits at the end of the experiment

Lots	**Body weight, kg**		**Total gain, kg**	**Daily gain during the experimental period**	
	Beginning of the experiment	End of the experiment		g	**%**
I – control	1.326±0.09	3.535± 0.30	2.209±0.12	14.63±0.,20	100.00
II -experimental	1.322±0.09	3.765± 0.12	2.443±0.10	16.18±0.18	110.59
III - experimental	1.322±0.04	3.260± 0.17*	1.938±0.11	12.83±0.14	87.70

Note**:** 3.260±0.12* - authentic data

Analyzing the results of the total gain and the daily weight of rabbits in group II-experimental, in which to animals as addition to base food ration were included fodder grown with fund of worm compost it was found that this exceeded that of the control lot with 10.59%.

The same indicators of body weight of rabbits in lot III experimental, decreased with 12.30% in comparison with animals of the control lot.

The results presented in Table 4 remarks that the total increase and daily weight of rabbits was more increased in the lot in which the animals received as a supplement to the basic food ration feed grown with the fund of worm compost (lot II-experimental). Total and daily gain of the body mass at these animals has exceeded those of animals in the control lot and the experimental lot-III, respectively with 10.59% and 26.11%.

The lowest total gain and daily weight was found at rabbits in the experimental lot III, in which the animals received addition to the basic food ration fodder collected on the lot with the fund of ammonium nitrate, which had a high content of nitrates. Total daily gain and body mass of animals in this lot decreased with 12.30% in comparison with that of animals in the control lot and with 20.70% of the animals in the experimental lot II.

Thus, using feed with a high content of nitrates in food ration of rabbits, contributed to the decrease of their body mass gain.

CONCLUSIONS

In the results of the investigations it was found that the accumulation of nitrates in forage crops depended on phenological stages and type of used fertilizers.

The use of ammonium nitrate for fertilizing crops, determined the accumulation of increased amounts of nitrates in alfalfa hay, fodder beet and maize plant side.

The value of accumulated nitrates in alfalfa hay, fodder beet and maize the plant has exceeded that of plants essentially in control lot. In this type of forage used in the food ration of rabbits the amount of nitrates exceeded the maximum permissible concentration with 10.00% (in hay from alfalfa), 14.88% (in fodder beet) and 85.28% - 122. 60% (in corn stems and leaves).

The use of feed with increased content of nitrates in food ration of rabbits contributed to decrease of their body mass gain.

Total daily gain and body mass of rabbits in experimental lot II, in which at the basic food ration of rabbits as additives were included fodders cultivated with worm compost fund, exceeded that of the control lot with 10.59 %, and the same indicators of the body mass of rabbits from lot III-experimental, decreased with 12.27% in comparison with those of animals of the control lot.

Total and daily increase of rabbits weight, that used plants cultivated with fund of worm compost exceeded those of animals in the control lot and those of experimental lot-III, respectively with 10.59% and 26.11%.

Thus, it was found that the increased amount of nitrates in fodder used in the food ration of rabbits negatively influenced on body weight gain at rabbits.

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AN ANALYSIS OF BIODIVERSITY OF LITHUANIAN FAMILY FARMS

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Abstract

The paper aimed to measure the biodiversity of Lithuanian family farms using readily available FADN data. The research draws on a sample of 1304 family farms. Farms diversity is expressed by diversity in land use and cropping based on Shannon's equitability and Simpson's diversity indices. The effects of farms' management to biodiversity between farms in terms of specialization, economic size, farming intensity and land area are examined. The biodiversity indices ranged from 0 to 1 (scaled into three intervals), assuming that the closer to 1 were the values of the index the higher was biodiversity of the farm. Lithuanian case analysis suggested that certain measures for strengthening farms biodiversity were necessary as the average values of the biodiversity based on Shannon's equitability (land use and cropping) and Simpson's diversity (land use and cropping) indices fell within the medium biodiversity interval. Lower diversity values of Simpson's diversity in comparison to Shannon's indices values were obtained across analysed farming types and farm classes. This is likely related to Simpson's index sensitivity to the number of land use and cropping elements of farms. Though, the Shannon's equitability index has greater importance to rarer land use or cropping elements. Therefore, for policy purposes both indicators provide valuable insights to enhance and maintain the biodiversity on farms.

Key words: *biodiversity, FADN, Shannon equitability index, Simpson diversity index*

INTRODUCTION

Maintaining biodiversity is one of the key issues of sustainable development [1] and agricultural intensification is one of the main drivers of worldwide biodiversity decline [1, 3, 12]. The biodiversity is important issue in the EU since the Rio de Janeiro summit in 1992. The protection of biodiversity is legislated in the Birds and the Habitats Directives and the EU Biodiversity Strategy, entitled "Our life insurance, our natural capital: an EU biodiversity strategy in 2020". Also the environmental objectives have become increasingly integrated into the EU's Common Agricultural Policy [15]. The European agricultural policy stimulates organic farming, projects associated with environmentally friendly investment and innovation measures through rural development programmes. For the period of 2014–2020, the CAP recommends that 30% of direct payments to be linked to environmentally-friendly farming practices as, crop diversification, maintaining permanent grassland and conserving 5%, and later 7%, of areas of ecological interest [2, 15]. To determine the extent to which such policy objectives are being fulfilled and to enhance biodiversity in arable land the operational assessment tools for stakeholders are required [6, 9]. However, the complexity of all the aspects of the term biodiversity presented by Kaennel [11] demonstrated that no single tool to evaluate biodiversity can be devised. Bockstaller et al. [1], Clergue et al. [3] provided an overview of biodiversity assessment tools in agricultural areas. Herzog et al. [9] emphasised the importance of farm-scale measurement. Large number of studies has been done to evaluate and compare biodiversity results at a farm level [9, 10, 13, 23, et al.]. The biodiversity is a central element of sustainable agricultural development. Therefore, usually the biodiversity is analysed as one of the component of environmental sustainability in farm sustainability research [7, 8, 20, 22, 24, et al.]. As pointed out by Clergue et al. [3], assessment tools must be easily usable in order to be generalised for other case studies and to help decision-makers involved with land-use management. Besides, tools must be useful to communicate with farmers and encourage them to adopt practices maintaining biodiversity at farms. In response to these issues, the biodiversity assessment mostly relied on simple indicators (e. g percentage of area cropped in organic farming, average number of crops per farm, percentage of area cropped intensively) and composite indices (Shannon's index, Simpson‘s index) in farms sustainability scientific research.

As stressed Diazabakana et al. [5], data gathering for the calculation of indicators can be time-consuming and expensive. Therefore, readily available data sources such as Farm Accountancy Data Network (FADN) have been employed [22, 7, 14, 10, 23, et al.]

European Union, aiming at halting biodiversity loss, has adopted the Farmland Bird Index as an indicator of structural changes in biodiversity [16]. According to this indicator the biodiversity has declined in Lithuania. In 2014, the Shannon equitability index value was 0.54, compared to 0.59 in 2010. As stated by Czyżewski and Brelik [4], from the perspective of sustainable land management, the resignation of many farmers from livestock has many negative consequences for the health of soil. Moreover WAS et al. [21] indicated that in Lithuania the share of cereals is too high and must be reduced due to biodiversity requirements. According to Eurostat data, in 2015 the share of crop production, cereal and rapeseed comprised the larger portion of the gross agricultural output value as compared to livestock output, if calculated at the basic prices, and as compared to 2010, increased by 9.9 percentage points in Lithuania. Analysis of the scientific literature has suggested that biodiversity assessment of Lithuanian family farms has been little studied. Therefore, an aim of the current paper was to measure the Lithuanian family farms biodiversity using FADN data. Farms diversity is expressed by diversity in land use and cropping based on Shannon's and Simpson's indices. To account for the effects of farms' management strategies to biodiversity the comparison analysis between farms groups is presented.

MATERIALS AND METHODS

The family farms' farming data were obtained from Lithuanian FADN. The sample size comprised of 1304 family farms in 2014. These farms are aggregated into farm types based on specialization and into farm classes based on economic size (related to the total Standard Output), intensity (total output per ha UAA) and land area (utilized agricultural area (UAA)) (Table 1).

Table 1. Farms sample distribution according to specialization, economic size, intensity and land area

Farm types, classes	Number of farms	Average farm size (ha UAA)
Specialization		
Specialist cereals, oilseeds and protein crops	453	87.5
General field cropping, mixed cropping	125	34.5
Horticulture and permanent crops	64	10.6
Specialist dairying	303	27.2
Grazing livestock	92	35.0
Specialist granivores	8	30.7
Field crops-grazing livestock, combined	209	42.1
Various crops and livestock combined	50	14.7
Economic size classes (thou EUR)		
Small scale (less than 16)	255	25.9
Medium scale (from 16 to 40 ESU)	303	57.8
Large scale (40 ESU or over)	746	249.0
Intensity classes		
Low intensity (total output per ha less than 500 EUR)	23	89.5
Medium intensity (total output per ha from 500 to 3000 EUR)	822	138.8
High intensity (total output per ha 3000 or over EUR)	459	204.6
Land area (farm size classes of UAA)		
Less than 5 ha	22	2.7
From 5 to 10 ha	47	7.2
From 10 to 20 ha	83	14.9
From 20 to 30 ha	85	25.0
From 30 to 50 ha	170	40.2
From 50 to200 ha	571	103.0
From 200 to 500 ha	246	306.0
500 ha or over	80	795.6

Note: the distribution of land area and specialization is based on Lithuanian FADN farm typology (http://laei.lt/index.php?mt=leidiniai&straipsnis=955&metai=2015); the distribution of economic size and intensity classes is based on typology proposed by Reidsma and Ewert [17].

After literature review on biodiversity assessment most commonly employed are the Shannon's and Simpson's indices. The Shannon index of diversity (H_{Sh}, see Shannon and Weaver [18]) is calculated using the following formula:

$$H_{Sh} = -\sum_{i=1}^{S} pi \times \ln pi \,;$$

where H_{Sh} is Shannon diversity index, S is the number of land use elements (or cultivated crops) in a certain farm, pi denotes the proportion of the area covered by a specific land use element (or crop) in a certain farm.

The Shannon equitability index E_{HSh} (or Shannon evenness index) shows the Shannon index in proportion to the maximum diversity index possible for the farm:

$$E_{H_{Sh}} = \frac{H_{Sh}}{H_{Sh}max} = \frac{H_{Sh}}{\ln S}.$$

The Shannon equitability index evaluates farm's biodiversity and takes into consideration the number of different land use elements (or crops) observed and their relative abundance. The index is based on values within the range of 0–1, with zero representing a farm with no diversity (only one land use element or crop) and a value of one representing the maximum diversity.

The second measure of species diversity is Simpson index (D_{Si}, see Simpson [19]):

$$D_{Si} = 1 - \sum_{i=1}^{S} pi^2 .$$

The Simpson diversity index is a measure of diversity which takes into account richness and evenness. With this index, zero represents no diversity (only one land use element or crop) and a value of one represents infinite diversity.

In this paper the Shannon equitability and the Simpson diversity indices were employed. The indices of biodiversity ranged from 0 to 1 scaled into three intervals: 1) low biodiversity score which fell within the interval [0; 0.33]; 2) medium biodiversity score which fell within the interval [0.34; 0.66]; 3) high biodiversity score which fell within the interval [0.67; 1].

The indices of land use diversity on farms calculation was based on Lithuanian detailed FADN data of 27 crops. Eurostat categorization of crops into 14 different categories to estimate the indices of crop diversity was employed.

ANOVA test was used to measure statistical significance of the difference in the indicator values between the farm size classes. A p value of less than 0.05 ($p<0.05$) was considered to indicate a statistically significant difference across types of farming and the farms classes. The statistical package for social science (SPSS 22) was employed for processing and analysis of the collected data.

RESULTS AND DISCUSSIONS

The analysis on the biodiversity in Lithuanian family farms revealed that average values of the biodiversity Shannon equitability (land use and cropping) and Simpson diversity (land use and cropping) indices fell within the medium biodiversity interval. Calculated average values of biodiversity indices across different types of farming based on Shannon's equitability (land use and cropping) and Simpson's diversity (land use and cropping) are presented in Table 2.

Table 2. Values of biodiversity indices on family farms by farming type

Farming type	Land use elements on farms	Cropping elements on farms	Land use diversity		Crop diversity	
			Shannon equitability index	Simpson diversity index	Shannon equitability index	Simpson diversity index
Specialist cereals, oilseeds and protein crops	4.7	3.0	0.69	0.56	0.52	0.34
Horticulture and permanent crops	3.0	2.0	0.52	0.37	0.55	0.32
Specialist dairying	4.2	2.7	0.59	0.45	0.55	0.34
Specialist granivores	3.0	2.2	0.56	0.39	0.41	0.25
General field cropping, mixed cropping	4.9	3.5	0.70	0.57	0.64	0.44
Grazing livestock	3.4	2.3	0.49	0.35	0.46	0.26
Field crops-grazing livestock, combined	5.6	3.4	0.76	0.64	0.65	0.46
Various crops and livestock combined	4.3	2.5	0.63	0.51	0.50	0.31
Total	4.6	2.92	0.65	0.52	0.56	0.36
$F_{(7,1296)}$	23.3	23.9	20.5	32.0	7.4	13.8
Significance	***	***	***	***	***	***
Standard deviation	0.94	0.56	0.09	0.11	0.08	0.08
Coefficient of variation	22.7	20.7	15.3	22.1	15.4	22.3

Note: *p<0.05; **p<0.01; ***p<0.001; ****p>0.05.

The highest level of biodiversity was achieved on farms combined field crops with grazing livestock. The value of land use Shannon equitability index on farms combined field crops with grazing livestock fell within the high biodiversity interval, whereas, values of land use diversity Simpson index and crop diversity Shannon and Simpson indices fell within medium biodiversity interval. The lowest land use diversity was found on grazing livestock farms, whereas, the lowest crop diversity indices values were determined on specialist granivores (poultry, pigs) farms. The lowest average values of the biodiversity indices fell within the interval of medium biodiversity, except for the Simpson's crop diversity index, the average value of which fell within the low biodiversity interval and concentrated at the upper boundary of the low biodiversity interval.

Results from the use of Shannon’s and Simpson’s biodiversity indices of land use and crop diversity across analysed farming types indicated higher diversity values of land use diversity. This is likely related to obtained higher number of land use elements which were grouped to lower number of cropping elements on farms.

Moderate variation of Shannon’s equitability (land use and cropping) indices across farm types was determined, and made 15.3 % for land use diversity and 15.4% for crop diversity. High variation of Simpson’s diversity (land use and cropping) indices across the analysed farm types was established (22.1% and 22.3 % in land use and cropping, respectively). This explains that biodiversity state is rather different in considered farms types.

Calculated average values of biodiversity indices across economic size classes based on Shannon’s equitability (land use and cropping) and Simpson’s diversity (land use and cropping) are presented in Table 3.

Table 3. Values of biodiversity indices on family farms by economic size classes

Economic size classes	Land use elements on farms	Cropping elements on farms	Land use diversity		Crop diversity	
			Shannon equitability index	Simpson diversity index	Shannon equitability index	Simpson diversity index
Small scale	3.7	2.4	0.64	0.48	0.51	0.31
Medium scale	4.2	2.6	0.63	0.48	0.53	0.32
Large scale	5.0	3.2	0.67	0.55	0.58	0.39
Total	4,6	2.9	0.65	0.52	0.56	0.36
F $_{(2,1301)}$	44.8	65.9	3.1	15.3	7.0	22.9
Significance	***	***	*	***	***	***
Standard deviation	0.61	0.43	0.02	0.04	0.04	0.04
Coefficient of variation	14.3	15.8	3.2	8.0	6.7	12.8

Note: *p<0.05; **p<0.01; ***p<0.001; ****p>0.05.

The highest level of biodiversity was achieved on large scale farms. The values of land use Simpson diversity index and crop diversity Shannon equitability index fell within the medium biodiversity interval, whereas, the crop diversity Simpson index value concentrated closer to the bottom boundary of the medium biodiversity interval. By contrast, the value of land use diversity Shannon equitability index fell within the high biodiversity interval and concentrated at its bottom boundary. The lowest land use diversity based on Shannon’s equitability index was found on medium scale farms and based on Simpson’s diversity index the lowest value was observed on small scale and medium scale farms classes. The lowest crop diversity based on Shannon’s and Simpson’s indices was found on small scale farms. The lowest average values of the biodiversity indices across the analysed farm economic size classes fell within the interval of medium biodiversity, except for the Simpson’s crop diversity index, the average value of which fell within the low biodiversity interval and concentrated at the upper boundary of the low biodiversity interval.

Low variation of Shannon’s equitability (land use and cropping) indices and Simpson’s crop diversity indices was observed, except for Simpson’s crop diversity indices, which value indicates the moderate variation. This explains that biodiversity state is rather similar in considered farms economic size classes.

Table 4 provides average values of Shannon’s equitability (land use and cropping) and Simpson’s diversity (land use and cropping) indices according to the farm intensity classes.

Table 4. Values of biodiversity indices on family farms by intensity classes

Intensity classes	Land use elements on farms	Cropping elements on farms	Land use diversity		Crop diversity	
			Shannon equitability index	Simpson diversity index	Shannon equitability index	Simpson diversity index
Low intensity	3.0	2.0	0.60	0.40	0.55	0.30
Medium intensity	4.8	2.9	0.68	0.55	0.55	0.35
High intensity	4.3	3.0	0.61	0.48	0.57	0.38
Total	4.6	2.9	0.65	0.52	0.56	0.36
F $_{(2,1301)}$	16.9	7.9	10.3	18.4	1.3	2.8
Significance	***	***	***	***	****	****
Standard deviation	0.93	0.55	0.04	0.08	0.01	0.04
Coefficient of variation	23.0	20.9	6.9	15.7	2.1	11.8

Note: *p<0.05; **p<0.01; ***p<0.001; ****p>0.05.

The highest level of land use biodiversity was achieved on medium intensity farms based on Shannon’s and Simpson’s diversity indices. Whereas, the highest level of crop diversity in terms of Shannon’s and Simpson’s indices was observed on high intensity farms. The lowest land use diversity was found on low intensity farms. The lowest crop diversity based on Shannon’s equitability index was indicated in low and medium intensity classes.

The lowest Simpson’s crop diversity was determined on low intensity farms. Low variation of Shannon’s equitability (land use and cropping) indices across farm intensity classes was determined, and made 6.9 % for land use diversity and 2.1% for crop diversity. Moderate variation of Simpson’s diversity (land use and cropping) indices across the analysed farm intensity classes was established (15.7% and 11.8 % in land use and cropping, respectively). Medium and high intensity farms were found to have more beneficial effect on conservation of agricultural biodiversity.

The calculated values of biodiversity indices on family farms by farm size classes of UAA are presented in Table 5.

Table 5. Values of biodiversity indices on family farms by farm size classes of UAA

Land area (farm size classes of UAA (ha))	Land use elements on farms	Cropping elements on farms	Land use diversity		Crop diversity	
			Shannon equitability index	Simpson diversity index	Shannon equitability index	Simpson diversity index
Less than 5 ha	2.8	1.9	0.54	0.40	0.47	0.27
From 5 to 10 ha	3.3	2.4	0.69	0.48	0.58	0.34
From 10 to 20 ha	3.6	2.3	0.63	0.46	0.54	0.33
From 20 to 30 ha	3.9	2.5	0.64	0.47	0.52	0.32
From 30 to 50 ha	4.0	2.6	0.62	0.47	0.55	0.34
From 50 to200 ha	4.6	2.8	0.66	0.52	0.54	0.35
From 200 to 500 ha	5.4	3.5	0.69	0.58	0.61	0.42
500 ha or over	5.6	4.0	0.65	0.57	0.55	0.42
Total	4.6	2.9	0.65	0.52	0.56	0.36
$F_{(7,1296)}$	22.9	30.1	2.10	7.10	1.70	6.20
Significance	***	***	*	***	****	***
Standard deviation	1.0	0.7	0.05	0.06	0.04	0.05
Coefficient of variation	23.7	24.8	7.5	12.1	7.5	14.4

Note: *p<0.05; **p<0.01; ***p<0.001; ****p>0.05.

The highest level of land use diversity based on Simpson’s diversity index was achieved on the large-sized farms (from 200 ha UAA or over). According to Shannon’s equitability index the highest level was observed on farms at two considered farm size classes, i.e. from 5 to 10 ha UAA and from 200 to 500 ha UAA. Calculated crop diversity indices (Shannon and Simpson diversity indices) has showed that more efforts were made by large-sized farms (from 200 ha UAA and over).

The highest values of land use and crop diversity fell within the medium biodiversity interval, whereas, the value of land use Shannon’s equitability index fell within the high biodiversity interval and concentrated at its bottom boundary. The lowest biodiversity indices values across analysed farms size classes were found on the smallest-sized farms class and fell within the medium biodiversity interval, except for the crop Simpson’s diversity index the average value of which concentrated closer to the upper boundary of the low biodiversity interval.

The analysis of calculated Shannon’s equitability indices values suggested slightly difference between the farm size classes. This is evidenced by low variation of Shannon’s equitability (land use and cropping) indices across farm size classes (7.5 % for both considered diversity indices). Moderate variation of Simpson’s diversity (land use and cropping) indices across the analysed farm intensity classes was established (12.1% and 14.4 % in land use and cropping, respectively).

CONCLUSIONS

Lithuanian case analysis suggested that certain measures for strengthening farms biodiversity were necessary as the average values of the biodiversity based on Shannon’s equitability (land use and cropping) and Simpson’s diversity (land use and cropping) indices fell within the medium biodiversity interval.

Analysis on family farms biodiversity across considered farm types and classes revealed that the highest level of biodiversity was achieved by farms combined field crops with grazing livestock, large scale farms and by medium and high intensity farms. The best average biodiversity situation across observed farm size classes of UAA was found on the large-sized farms class (from 200 to 500 ha UAA) and small-sized class (from 5 to 10 ha UAA).

Lower diversity values of Simpson’s diversity in comparison to Shannon’s equitability indices values were obtained across analysed farm types and farm classes. This is likely related to Simpson’s index sensitivity to the number of land use and cropping elements of farms. Though, the Shannon’s equitability index has greater importance to rarer land use or cropping elements. Therefore, for policy purposes both indicators provide valuable insights to enhance and maintain the biodiversity on farms.

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PRODUCTION COSTS OF FIELD CROPS BY ECONOMIC SIZE OF FARMS IN ROMANIA

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Abstract

The cost competitiveness is a key topic in agriculture. Knowledge about costs at microeconomic level is a useful instrument for the orientation of producers, as well as for decision makers at aggregate levels. The paper focuses on the empirical analysis of production costs for field crops in Romania, using the methodology and data of the EU Farm Accountancy Data Network. The analysis takes into consideration the economic size of farms and is mostly relevant in the case of specialized farms. The cost structure reveals differences when comparing small with large farms and it provides a benchmark to individual farms when they need to know their position within their size class.

Key words: *economic size of farms, field crops, production costs, Romania*

INTRODUCTION

In a globalized world, the cost competitiveness is a key topic also in agriculture. Thus, the cost analysis, also in terms of opportunity costs, as well as the international comparison of commodity specific costs became instruments for the orientation of agricultural producers [5]. Countries which are interested in production practices and financial state of farms and in the wellbeing of farmers collect data usually based on statistical surveys, different from one country to the other.

The European Union created an instrument of analysis offered by the methodology of the Farm Accountancy Data Network (EU FADN). The production cost model relies on an accounting system which is different from the one used in financial accounting [6]. Although the data provided by EU Member States for the FADN data base [2] are not completely harmonized, this model is already useful for decision making within EU.

In Romania, the interest for the level and structure of production costs in agriculture increased under the pressure of competition. The indices of costs were not correlated with the indices of production in the last decade (2005-2014), due to variation of weather conditions, but also to the price scissors between the variation of input prices and prices of agricultural products [1]. The individual performance of farms is however very heterogeneous and is strongly influenced by the economic size of farms. Studies have focused on the analysis of the cost structure in connection to efficiency of production [10]. Special attention is paid to the reduction of costs per ton as a mean to increase the profitability of agriculture on the agribusiness chain, for example the chain of bread cereals [8] and of oilseed products [9].

Although in the EU, but also worldwide, the highest share of agro-food production is in the hands of large producers, in recent years the interest of final consumers for local produced food has increased. The recommendation for the future is that products offered on the market should be produced with less water consumption, fossil fuel, fertilizers etc.[7]. This results into higher quality of food and environment protection, but lower yield per hectare and higher costs per hectare. Consequently, the cost analysis makes the difference between conventional and ecological crops.

The paper focuses on the identification of differences regarding cost structure per hectare for field crops produced in the conventional system in Romania, considering the farm size as main factor of influence.

MATERIALS AND METHODS

The analysis refers to farms which produce field crops, such as cereals, oilseed-crops, sugar beet, rice, hemp, hops, tobacco and potato. Data are provided by the Farm Accountancy Data Network (FADN).

FADN is monitoring the production for the market. The field of observation includes agricultural farms with an economic size over 2,000 Euro (a low limit, suitable for Romania, accepted in the survey,). The economic size of farms included in the FADN survey is based on the Standard Output (SO) of the farm. The data for Romania in 2013 relies on the sample of farms counting initially 6,000 farms, of which only 5,901 were validated by the European Commission [3].

The research method consists of an empirical analysis of production costs per hectare, calculated as average by categories of farms established by RICA, according to the economic size criteria. The data are not suitable for directly estimating the cost of production for specific crops.

RESULTS AND DISCUSSIONS

Production value per farm

The economic size of farms depends on the size of areas cultivated with cereals and other field crops. Thus, In Romania, a small farm according to standard economic size (2,000 ≤ 8,000 euro) cultivates in average 1.73 hectares with cereals and 0.21 hectares with other field crops. The largest farms (over 500,000 euro) cultivates in average 928 hectares with cereals and 408 hectares with other field crops (Table.1). The large scale production has a major favourable impact on the productivity and on the costs per output unit.

The structure of field crop production shows that in larger farms (over 50,000 euro) cereals represent about 55-60% of the total field crop production value. The next significant crop in this dimensional category is the oilseeds production, which contributes with about 18-24% to the total crop production value per farm. All together these two crops represent 74-85% of the total value of production.

Table 1. Areas cultivated with cereals and other field crops, by economic size of farms, 2013

Economic size of farms	**Cereals** (common wheat, durum wheat, rye, oat, mixed summer cereals, corn, other cereals)	**Other field crops** (Pulses, potatoes, sugar beet, oleaginous crops, hops, tobacco, other industrial crops)
Euro	**Hectare**	**Hectare**
2,000 ≤ 8,000	1.73	0.21
8,000 ≤ 25,000	5.35	1.06
25,000 ≤ 50,000	26.88	7.52
50,000 ≤ 100,000	79.52	27.3
100,000 ≤ 500,000	283.3	117.25
≥ 500,000	928	408.42

Source: FADN Report for Romania. Standard results, 2013, p. 26

In the largest farms, over 500,000 euro, the production of cereals and oilseed crops contributes with 85% to the total value of agricultural production, which indicates that they are specialised in these crops.

Specific costs per hectare

The specific costs for crops are calculated as the sum of costs of seeds and seedlings, fertilizers and soil improvers, crop protection products and other specific crop costs. In order to calculate specific costs per hectare, the total specific costs per farm were divided by the average Utilized Agricultural Area (UAA) per farm (Table 2).

Table 2. Specific costs for crops, average per farm and per hectare, 2013

Economic size of farms	Specific costs for field crops, in average per farm	Utilized Agricultural Area (UAA) per farm	Specific costs per hectare
Euro	**Euro**	**Hectare**	**Euro/ha**
2,000 ≤ 8,000	676	...	...
8,000 ≤ 25,000	2,446	13.45	181.86
25,000 ≤ 50,000	9,496	57.77	164.38
50,000 ≤ 100,000	26,499	137.44	192.80
100,000 ≤ 500,000	100,732	449.63	224.03
≥ 500,000	354,424	1,413.79	250.69

(...) no data regarding UAA

Source: own calculations based on FADN Report for Romania, 2013[3] and EU FADN database [2]

The variation of specific costs per hectare between size classes may have several causes. The crops produced are mixed in different proportion (most farms are not strictly specialized), therefore the costs of seeds are specific and may have also different prices (the costs for seeds and seedlings considered by the above calculations include also horticultural crops). In addition, smaller farms may have less costs per hectare for high quality seeds, for fertilizers, soil improvers or crop protection because they have lower financial resources.

For comparison, we may take the example of the FADN standard economic size 50,000 ≤ 100,000 euro. In Romania, this category registered in 2013 an average of 80 hectares cultivated with cereals (table 1), while the average specific costs were 192.8 euro/hectare in 2013. These costs are significantly lower than those estimated according to the standard technology recommended by "Kuratorium für Technik und Bauwesen" [4]. In this second case the costs (exclusively costs for irrigation) for the conventional production, calculated for 80 hectares cultivated area, were estimated at about 638 euro/hectare for wheat, 427 euro/hectare for rye and 467 euro/hectare for corn. The cost differential results in productivity differential. For example, in Romania, the yield per hectare for wheat varied in the last decade from 1.54 tons in 2007 to 3.78 tons in 2015. The present potential output is 5 tons wheat/hectare associated with higher costs, while the foreign standard for potential output is 7.89 tons of wheat/hectare.

Farming overheads

Farming overheads do not depend on specific production lines. They include costs for current upkeep for equipment, energy, contract works and other farming overheads. These non-specific costs of crops, per hectare, were calculated as the overheads per farm divided by the average Utilized Agricultural Area (UAA) per farm (Table 3).

Table 3. Farming overheads, average per hectare, 2013

Economic size of farms	Current upkeep for equipment	Energy	Contract works	Other farming overheads	TOTAL non-specific costs
Euro	**Euro/ha**	**Euro/ha**	**Euro/ha**	**Euro/ha**	**Euro/ha**
2,000 ≤ 8,000	...	...	...	...	...
8,000 ≤ 25,000	45.95	76.51	66.02	17.17	205.65
25,000 ≤ 50,000	21.85	55.46	52.41	9.21	138.93
50,000 ≤ 100,000	17.59	68.75	51.33	9.33	147.00
100,000 ≤ 500,000	17.75	78.78	39.03	12.83	148.39
≥ 500,000	22.81	118.41	42.26	24.39	207.87

(...) no data regarding UAA
Source: Ibid

The dimension of costs in the case of total overheads per hectare is comparable by economic size classes, but there are some explainable differences. The highest costs of current upkeep of equipment are registered by smaller farms (8,000 ≤ 25,000 euro), due to prevailing externalization of repair and maintenance services, which require higher costs.

Depreciation

The highest depreciation per hectare occurs in the case of the largest farms, with farm size over 500,000 euro (table 4). These farms, which have almost exclusively mechanized operations in the field, have invested in tractors and agricultural equipment and have a far better technical endowment, with high power machines, compared to medium and small farms.

Table 4. Depreciation, average per hectare, 2013

Economic size of farms	Depreciation, average per farm	Depreciation per hectare
Euro	**Euro**	**Euro/ha**
2,000 ≤ 8,000	898	...
8,000 ≤ 25,000	1,321	98.22
25,000 ≤ 50,000	2,930	50.72
50,000 ≤ 100,000	6,069	44.16
100,000 ≤ 500,000	28,521	63,43
≥ 500,000	149,069	105.44

(...) no data regarding UAA
Source: Ibid

At the same time, in farms with a smaller economic size (8,000 ≤ 25,000 euro) depreciation per hectare is almost as high as in the large farms. They have technical endowment that allows the proper execution of agricultural work (for their own production and for other smaller producers demanding for services), but they are generating high cost due to the small cultivated area.

Payment for external factors

Payments for external factors consist of payments for the third parties for inputs and include wages and social security payments, rent paid for agricultural land and for rentals, as well as interest paid. These payments per farm and per hectare (Table 5) depend on the mechanization degree of agricultural operations and implicitly on the skills of the employees, as well as on the supply/demand balance on local markets of the production factors.

Payments for external factors per hectare increase with farm size. Larger cultivated land areas require mechanized operations and consequently higher skilled agricultural workers who receive comparatively better salaries.

Data regarding the amount that could be received by unpaid workers are not available, thus implicit costs are not estimated and the labour costs are distorted. It is likely that workers without employment contract are mainly active in small and medium farms.

Table 5. Payment of external factors, average per hectare, 2013

Economic size of farms	Wages and social security	Rent paid	Interest paid	Total payments of external factors
Euro	**Euro/ha**	**Euro/ha**	**Euro/ha**	**Euro/ha**
2,000 ≤ 8,000	...	...	...	...
8,000 ≤ 25,000	70.04	40.00	1.93	111.97
25,000 ≤ 50,000	60.43	57.35	2.30	120.08
50,000 ≤ 100,000	60.77	68.83	4.15	133.75
100,000 ≤ 500,000	58.27	81,98	9.70	149.95
≥ 500,000	97.24	86.15	22.28	205.67

(...) no data regarding UAA
Source: Ibid

In large farms the interest paid are significant, since in most cases investments were financed by bank credits.

CONCLUSIONS

The analysis of FADN data regarding the level and structure of production costs is a valuable source of information about the microeconomic level in agriculture, despite some data deficits. The main findings are:

- The total costs per hectare are meaningful if they are calculated by economic size of farms, even if in Romania many small farms and subzistence producers are excluded from the data base;
- The lowest total costs per hectare are registered for the economic size 25,000 ≤ 50,000 Euro, mainly due to the level of operational costs (specific costs and overheads). At the same time, in the largest farms (over 500,000 euro) these costs are the highest.
- The production cost model is mostly relevant in the case of specialized farms. For the multi-product farms more information is needed to fill the absence of enterprise specific data. In Romania most of the large farms are specialized in cereals and oilseed production, which makes the analys of cost components suitable and allows the observation of differences between costs at farm level and a certain average level of the group it belongs to.

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HAIL SENSITIVE AREAS IN THE REPUBLIC OF MOLDOVA

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Abstract

In this study, the geographical and local topographic factors have been incorporated into geo-statistical approaches and also various models have been developed relating hail events to site position to assess of a hail hazard at high resolution in the Republic of Moldova. An assessment of the average number of hail days, frequency of a year with hail incidences and peak values by natural zones of Moldova has been derived based on the hail incidence records for 68-years (1949-2015). Hail Sensitive Areas (HSAs) at high resolution are delineated to design resilience for coping with this climate hazards at community level. The research findings ensure more effective use of the hail data and better understanding climatology of hail risk across the Republic of Moldova, and, therefore, facilitate decision making and determination of hail insurance rates throughout the country.

Key words: *Hail Sensitive Areas, Multivariate Regression Model, Geo-statistical Approach*

INTRODUCTION

Hail hazard assessment is a great challenge since hail falls are not reliable monitored by observation systems. Due to small spatial extent of hail falls the estimates based on the existing observation network cannot describe the complexity of surface hail occurrence [13]. Hail frequency research has been carried out in various countries using data from weather stations, hail pads and radar or satellite proxy data sets [2, 3, 5, 8, 20, 23]. However, the analysis are limited in scope because of the constraints inherent in hail related to lack of an appropriate monitoring systems and short time data sets. Sioutas et al. [23] revealed a strong correlation of hail falls with the topographical factors for northern Greece, since the hail maxima are located close to the lee sides of mountain barriers. Baldi et al. [2] studied hailstorm intensity in Italy by using observational data sets and a statistic model. They identified areas of greatest intensity in the Alpine region. The results of the statistical approach estimated maximum hail occurrences in north-west Italy and south Tuscany with values ranging between 1.5 and 2 annual events.

Hail have been well studied in North America, particularly in the USA, where there are large societal impacts of hazardous convective weather (tornadoes, hail, and damaging wind) and a long observational record. Early hailstorm studies in USA [6,7] reviewed hail information at various time and space scales, and pointed out the principal hail areas in North America. Recent studies [1, 25] has been developed an empirical model relating monthly hail occurrence to the large-scale environment for the United States. An effort to update hail climatology has been made also in China [18] with the use of a long record of observations from 1959 to 2014.

Information about the hail incidence in the Republic of Moldova can be found in a number of sources. The most comprehensive information on hail is given by Lasse [14]. There are a number of other sources and cartographic references [11, 12, 16, 17, 21, 22]. These studies represent an important stage in the climatology of hail risk in the Republic of Moldova which allowed significantly increasing the awareness (guidelines, cartographic materials, etc.) of the main stakeholders on the hail as a hazardous weather phenomenon over the Republic of Moldova. However the early regional hail studies, based on a regime-reference approach and limited data sources, are fail to illustrate the true complexity and fine details of surface hail occurrence since the complex topography of the Moldova gives a specific climate response to hail variability [10].

Nevertheless, they do indicate some important general trends in hail distribution patterns. These appear to be related to topographical factor such as altitude.

In this study, by using the most recent data, an attempted to incorporate local topographic factors to develop model relating to climatology of hail risk over the Republic of Moldova at high-resolution. In particular, the combinations of statistical and geo-spatial approach have been used to be effective in spatial modeling the hail hazard in the complex terrain of the country. It was undertaken in an effort to obtain hail information at high resolution which could eventually lead to a better definition of the Hail Sensitive Areas (HSAs), and, therefore, facilitate the decision making and determination of hail insurance rates throughout the country.

MATERIALS AND METHODS

Data

Climatologically hail records, as provided by conventional stations of the State Hydro-meteorological Service of Moldova (SHS), are referred to days of hail observed on the ground. In the research, a hail day is defined as a day during which hail is observed and recorded at each meteorological station. An assessment of the average number of hail days, frequency (%) of a year with hail incidences and peak values by natural zones of Moldova was derived based on the hail incidence records for 68-years (1949-2015). For building a robust statistical model to obtain the hail hazard estimates in the complex terrain of the Republic of Moldova, 13 stations were included in the analysis with a reduced length of the hail time series (1963-2015). The mean annual hail frequency at a station is defined as the mean number of hail days per year. The mean monthly hail frequency is defined as the average number of hail days in each month.

Multivariate nonlinear regression model. We have attempted to incorporate local topographic factors into geo-statistical approach to produce accurate spatially-distributed estimates of hail days in the Republic of Moldova by using a multivariate nonlinear regression model. Seven geographical factors (latitude (φ) and longitude (λ) and meso- and microscale topographical factors (altitude (h), relative altitude (Δh), rugosity (r), slope (s) and aspect (a)) have been used as explanatory variables. The quantified values of the explanatory variables used to develop the model were derived from a digital elevation models (DEM) for 90 m x 90 m resolution grid using ArcGIS. The analytical function obtained was then used to produce spatially-distributed estimates of hail at high resolution.

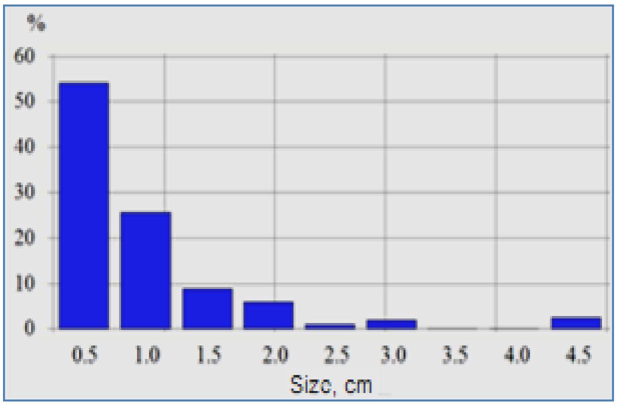
The selection criterion for explanatory variables was based on the highest value of F - statistics which is equal to the square of t-statistics for variables included in the regression equation. The model equation was calculated for all possible combinations of explanatory variables with limitations for significantly correlated (at $\alpha < 0.01$) and the number of explanatory variables (not to be exceeding 30% of the total number of observations) included in the equation [15]. The "best" model equation was chosen from all combinations based on the value of the adjusted determination coefficient, R^2 *adj*.

RESULTS AND DISCUSSIONS

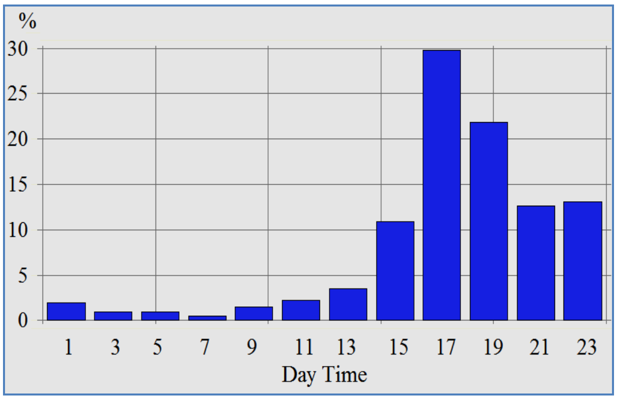
Hail climatology

The number of days with hail is a highly variable parameter. The season of occurrence of hail in Moldova extends from April to September. The peak period of hail is from May to August, when over 90% of the cases occur. The most active months are May and June (respectively 21% and 26%). In August hail had been observed in 14% of years. In early spring (March) and late fall (November) hail is rare. There are also isolated cases of hail in the winter, for example, in February 1966 [14].

The occurrence hail also has diurnal variation. The peak time of day hail activity is observed from 17 to 19 hours (Fig.1).



a)



b)

Fig. 1. The size (a) and day time (2) of hail occurrence, % (Republic f Moldova)

Source: Adapted from Daradur M., Cazac V., Fedotov., L. 2009

Hail is usually accompanied by strong thunderstorms, intense torrential rainfall, squally wind, which greatly increase the destructive potential of hail by the formation of flash floods, runoff topsoil on slopes, soil erosion and other negative effects. More than 50% of the hail size is less than 0.5 cm and in some cases (approximately 2%) may exceed 4 cm the maximum hail size (7 cm) had been observed on August 29, 1969 at the Bricheni meteorological station [4].

The Table 1 presents averages for the climate zone and sub-zone of Moldova with records of 68 years (1949-2015).

Table 1. Average number of hail days, frequency (%) of a year with hail incidences and peak values by natural zones of Moldova with 68-years (1949-2015) records.

Natural zone	Landscape region	mean	Frequency, % years	max
A. Forest-steppe zone	I. Region of elevations and forest steppe	0.8	70	7
	II. Balti region of steppe elevations and plains	0.6	48	5
	III. Region of Codrii forest deviations	1.5	84	8
B. Steppe Zone	IV. Steppe plain region of the lower Dniester terraces	1.0	60	5
	V. Region of fragmentary plains of Bugeac steppe	1.0	66	4

Source: State Hydrometeorological Service, the Republic of Moldova

Calculations carried out in the State Hydrometeorological Service based on the observational data, shows wide range variability of hail occurrence over the territory of Moldova. Based on these statistics, on average, 0.6-1.4 hail days can be expected in Moldova every year. The lowest hail-days values are 0.6 days at Balti region and the highest values are in the hilled central regions (Codri) where averaged is 1.4 days. The maximum number varies from 4 hail days at South (Bugeac steppe zone) up to 8 days in the forested Region of Codrii.

However the complex topography of the Republic of Moldova considerably changes the hail formation environment and gives a specific climate response to hail distribution, particularities of which are not accurately and uniquely captured by the observation network.

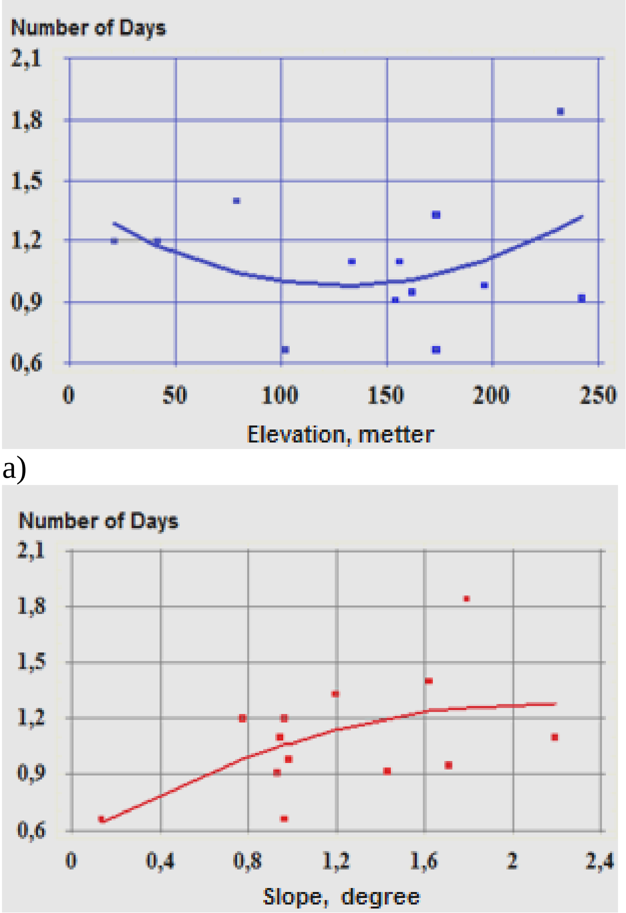
Hail sensitive areas at high resolution

A limited study have investigated the terrain impacts on hail occurrence show that the complex topography gives a specific climate response to hail variability by modifying the heat transport and triggering forced convection resulting in considerably changes in natural environment of hail formation and climatology of hail risk [7, 9, 24]. A few empirical studies [9, 10, 15, 19] indicated that the relationship between frequency of hail and the topographic variable is non-linear.

Table 2. Correlation coefficient matrix for mean annual hail days (N) and explanatory variables

Parameters	N	φ	λ	h	Δh	r	s	a
N	1.00	0.25	0.29	0.39	0.23	0.51*	0.66*	0.20
Φ		1.00	-0.46	0.44	-0.11	0.04	-0.25	-0.17
λ			1.00	-0.69*	0.02	-0.06	-0.27	-0.28
H				1.00	0.00	0.01	0.24	0.49
Δh					1.00	-0.14	0.37	0.30
R						1.00	-0.14	0.37
S							1.00	0.26
A								1.00

*Note: * $\alpha < 0.01$*



a)

Fig. 2. Non-linear approximation of the relationship between average hail days (a) and topographic factors (elevation and slope) – (b)

Source: Daradur M., Cazac V., Fedotov., L. 2009

For example, the study found that in the specific conditions of Moldova, geographical factors (latitude, r = -0.41), and the meso- and micro topographical factors (rugosity, r = 0, 51 and slope, r = 0, 66) influence a noticeable impact (significant at α <0.01) on the hail formation. Terrain elevation has also an effect forcing convective processes and hail intensity (r = 0.39).

Applying a m*ultivariate nonlinear regression*, lead to obtaining a great improvement of the informational context of the statistical model. The most informative factors selected through the stepwise regression procedure are presented in the table 3.

Table 3. Regression statistics and evaluation of the multivariate regression model

Prediction variables and method of selection		R	R^2 adj, %
All variables	φ, λ, h, Δh, r, s, a	0,94	86
Forward	λ, s	0,79	64
Backward	φ, h, r, s	0,93	85

Note: R^2 adj is the adjusted determination coefficient, which compensates for the limitation of the determination coefficient by taking into account the size of the sample and the number of prediction variables.

The capability of the models to explain the spatial variability of hail incidence varies depending on the method of variables selection: its accuracy is 64% to 86%. Considering the limitations for significantly correlated (at $\alpha < 0.01$) and the number of explanatory variables (not to be exceed 30% of the total number of observations), the set of explanatory factors selected by backward method was chosen as the "best" model equation. The model explains 85% spatial variability of the hail days. The root mean squared error (RMSE) - a parameter for estimating relative error is 9%. The equations for annual hail pass the *F* tests at significance level 0.01. The high *adjusted determination coefficient* R^2adj show the goodness-of-fit of the equations.

The listed explanatory variables are then derived for a 90 x 90 m gridded surface and used with the model equation to estimate hail days on that gridded surface. Terrain-related sensitivity to hail falls is displayed in the fig.3. Geographical hail distribution indicates some important general trends of spatial hail falls patterns over the territory of Moldova, which appear to be related to the local topographic features.

The Moldova's areas of greatest hail frequency are in the hilly and highly segmented regions (Codri) where averages are more than 1.5 hail days (1-2 hail event per year).

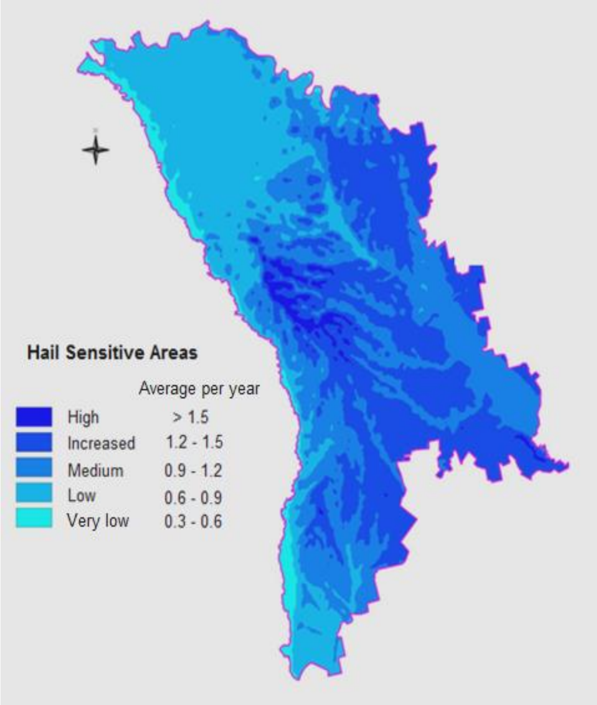


Fig. 3. Hail sensitive areas in the Republic of Moldova

The areas with lowest hail intensities are found in the Balti plains region where hail is a rare event and occurs only once every two - three years. Thus, the complex topography of Moldavian territory gives a specific response to the climatology of the hail risk. In the hilled and highly segmented areas the natural environment are considerably modified by the complex topography resulting in the forced convection and the intensification of a hail formation.

CONCLUSIONS

High level of the physical exposure to hail, combined with insufficient capacity to manage risks creates a challenge for the natural and socio-economic subsystems of the Republic of Moldova. In the study an attempted has been to incorporate local topographic factors into geo-statistical approach to produce accurate spatially-distributed estimates of climatology hail risk in the Republic of Moldova.

The investigation ensures more effective use of the hail data in terms of aligning with extreme climate management design information and suggests an effective mapping of climatically predisposed to hail risk areas (HRAs) at high resolution. In particular, research findings show that the complex topography of Moldavian territory gives a specific climate response to hail spatial variability by changing the natural environment and promoting forced hail formation in the hilled and highly segmented areas of the country.

The Moldova's areas of greatest hail frequency are in the hilly regions (Codri) where averages are more than 1.5 hail days (1-2 hail event per year). The areas with lowest hail intensities are found in the Balti region where hail occurs only once every two - three years.

Hail climatology risk assessment at high resolution is an innovative task and that is required by a variety of models and decision support tools that are essential for designing resilience for coping with this high impact weather phenomenon at community level as well as for the determination of hail insurance rates throughout the country

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EFFECT OF CONSOLIDATION POLICY IN NIGERIAN BANKING INSTITUTIONS ON AGRIBUSINESS SECTOR PERFORMANCE (1995-2014)

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Abstract

The broad objective of this study was to analyze the effects of consolidation policy in Nigerian banking institutions on agribusiness sector performance. The specific policies of interest were merger and acquisition policy. The study covered 1995-2014 periods. Secondary data from CBN annual reports and statement of accounts, CBN bulletin and National Bureau of Statistics were used for the study. The data were analyzed by the use of regression models. Findings revealed that merger and acquisition consolidation policy in the Nigerian banking institutions, value of banks loan to agribusinesses, lagged value of national savings, population, rainfall and government capital investment to agribusiness sector significantly influenced agribusiness output in Nigeria within the study period. Merger and acquisition consolidation policy in the Nigerian banking institutions, external reserve, capital formation and agricultural export significantly influenced government credit allocation to agribusinesses in Nigeria within the study period. Merger and acquisition consolidation policy in the Nigerian banking institutions, exchange rate, rate of domestic utilization capacity for agribusiness commodities and population significantly influenced agribusiness export growth in Nigeria within the study period. The study concluded that merger and acquisition consolidation policy in the Nigerian banking institutions influenced the agribusiness sector performance as it leads to increase in both agribusiness output and government credit allocation to agribusinesses in Nigeria but did not lead to increase in agribusiness export growth. The study recommended that consolidation policy of the Nigerian banking institutions which led to increase in credit allocation to agribusinesses in Nigeria as well as improved agribusiness output must be sustained by the Central Bank of Nigeria and even made better in such manners that agribusiness output will grow and allow the country to make huge foreign income from agribusiness export especially now that the revenue from oil is on the decrease in the country.

Key words: *agribusiness sector performance, banking institutions, consolidation, policy*

INTRODUCTION

Policy is a deliberate intervention, a course of action taken by government, or financial institutions, management, an individual, to influence or arrive at pre-determined outcomes. Policies are diversified in nature and scope. According to [9], the relevant policies in the banking institution to agriculture included, direct credit to the agricultural sector on concessionary terms; the rural banking scheme in 1977 under which designated commercial banks were required to open specified numbers of rural branches in different parts of the country and with at least 40% of the total deposits in these rural banks lent to borrowers within those rural areas; Agricultural Credit Guaranteed Scheme Fund (ACGSF), which was aimed at reducing the risk borne by commercial banks in extending credit to farmers.

Consolidation in the banking system is a global phenomenon, which is said to have started in advanced economies many years ago. The need for a strong, reliable and viable banking system in Nigeria is under-scored by the fact that the industry is one of the few sectors in which the shareholders' fund is only a small proportion of the liabilities of the enterprise. It is therefore, not surprising that the banking institution is one of the most regulated sectors in any economy. It is against this background that the Central Bank of Nigeria (CBN) outlined the first phase of its banking sector reforms designed to ensure a diversified, strong and reliable banking industry. Thus, the reforms were designed to enable the banking system develop the required resilience to support the economic development of the nation by efficiently performing its functions as the medium of financial intermediation [16].

Merger and acquisition, which are divisions of consolidation are common place in developed countries of the world but are just becoming prominent in Nigeria especially in the banking sector. The issue of merger and acquisition in the banking institution started in October, 2003 under the past CBN Governor, Prof. Soludo. Though, most of the feeble banks were unwilling to comply until the new order on July 6, 2004 [8]. The situation changed from July 6, 2004 as many banks had either merged with or acquired other banks. Thus, merger and acquisition as consolidation tools has become a near permanent feature of our financial system after July 6, 2004 [7]. The policy of 25billion naira minimum capital base forced banks to enter into merger and acquisition to meet the requirement. Part of the broad objective of consolidation expected included improvement of profitability and efficiency of the banks in terms of operations and finance. Agribusiness sector on the other hand is capital dependent. Agribusiness, given its value chain effect is a vital integral component of economic growth of any country. Various cash crops that are produced in different countries could be major sources of economy if properly managed. A strong and efficient agricultural sector would enable a country to feed its growing population, generate employment, earn foreign exchange and provide raw materials for industries [17]. The agribusiness sector has a multiplier effect on any nation’s socio-economic and industrial fabric because of the multifunctional nature of agriculture [12].The agribusiness sector in Nigeria has been described by [13] as the most important sector of the economy which holds a lot of potentials for the future economic development of the nation as it had done in the past. Agribusiness performance in the economy continues to decline when compared to the contribution of other non-agribusiness sectors of the economy such as petroleum towards gross domestic product (GDP). Worst still, the budgetary allocations to agriculture has been reduced in the past few years in Nigeria [6].

[22] studied the impact of consolidation on performance, proxies performance as efficiency and profitability between the period 2003 to 2008.The finding show that consolidation has impacted on both profitability and efficiency but not significant. [20], reported a positive significant difference between earnings per share of nine banks, following their study of post-consolidation on profitability in Nigeria, using a time frame of 2006 to 2010, and also employing cumulative earning per share as the profitability or performance measure. Similarly, [1], considered recapitalization and bank performance, using yield on earnings asset, return on asset and return on equity as performance proxy. The study found a positive significant relationship between recapitalization and profitability (ROA and ROE) and a negative significant relationship with yield on earning asset (YEA). Furthermore, the study by [19] reported a strong positive significant effect of bank consolidation on bank performance, which implies that bank return increases with consolidation. [4] also found return on equity to be positively and significant to asset profile and capital structure of a bank which was used as proxy for consolidation in their study of merger and acquisition in Nigeria, analysis of pre and post-consolidation between 2006 to 2008. In addition, [14], study merger and acquisition on bank performance in Nigeria (UBA and SKYE banks) and reported a strong positive relationship between consolidation (shareholders’ fund) and performance (total assets).

[2] evaluated the impact of mergers and acquisitions on performance of banks in Nigeria. Pre-merger and post merger financial statements of two consolidated banks were obtained, adjusted, carefully analyzed and compared. The result revealed that all the two groups produced in addition to operational and relational synergy, financial gains far more than the 2+2=5 synergistic effects. Ratio technique and inferential statistical tools were used to highlight synergistic effects on the

merging banks.

MATERIALS AND METHODS

The study was carried out in Nigeria. Nigeria is an agrarian country with about 70% of her people engaged in agricultural production [10] and provides subsistence for two-thirds (2/3) of Nigerians who are low income earners [22]. There are 25 consolidated Nigerian banking institutions, precisely commercial banks operating in the country some of which were merged and acquired as a result of the consolidation policy by CBN in order to strengthen the financial system of the banks.

The study used secondary data, mostly time series. Consolidation policy data were collected from the publications of development finance and research department of the CBN, National Bureau of Statistics (NBS) on bank's credit allocation to agribusiness sector, agribusiness output, and government credit allocation in agribusiness sector of the economy and so on were elicited.

The tool of data analysis was multiple regression models. Regression analyses were employed in analyzing the data. The regression model estimated the response of agribusiness output to merger and acquisition consolidation policy in the Nigerian banks of study. It was specified in its implicit form as given below:

Agribusiness Output Model

$AIO_t = f(NASAV_{t-1}, ADLR_t, DOD_t, INF_t, BCAA_t, GCEA_t, VFI_{t-1}, RainFall_t, RER_t, POP_\tau, DMER_t)$

Where:

$AIO_{t=}$ Aggregate agribusiness output (Grain equivalent)

$NASAV_{t-1}$ = National savings (₦'Million) in period t;

$ADLR_t$= Bank's lending rate to agribusiness (%) in period t;

DOD_t = Domestic outstanding debts (₦'Million) in period t;

INF_t = Inflation rate (%) in period t.

$BCAA_t$= Bank's credit allocation to agribusiness (₦'Million) in period t,

$GCEA_t$ = Government capital expenditure on agribusiness (₦'Million) in period t

VFI_{t-1} = Value of food imports (₦' Million) in period t-$_1$,

$Rainfall_t$ = Average annual rainfall (mm) in period t, RER_t= Real exchange rate (₦/$) in period t,

POP_t = Nigeria's population (Millions) in period t,

$DMER_t$ = Merger and acquisition consolidation policy period (0 = pre-merger and acquisition consolidation policy period and 1 = post-merger and acquisition consolidation policy period). e_i = error term.

On *a priori* ground, it is expected that the coefficient estimates for POP_t, RF_t, $GCEA_t$, $BCAA_t$, $NASAV_t$, , $DMER_t > 0$; and RER_t, $ADLR_t$, DOD_t, INF_t , $VFI_{t-1} < 0$.

In this model $DMER_t$ was the focus variable.

A regression model was used to estimate the response of banks' credit allocation and agribusiness export growth in agribusiness sector to merger and acquisition consolidation policy within the period of study. The model is specified implicitly below:

Banks' Credit Model

$AS_t = f(AIO_t, RER_t, EX_t, CF_t, IF_t, PSQ_t, AE_t, VFI_{t-1}, DMER_t, e_i)$

Where:

AS_t = volume of banks' credit to agribusiness sector (₦) in period t;

AIQ_t = agribusiness output (₦'million) in period t

RER_t = Exchange rate (₦/$) in period t.

EX_t = External reserve (₦'million) in period t.

CF_t = Capital formation (₦'million) in period t.

IF_t = Inflation rate (%) in period t.

PSQ_t = Percentage share of other sectors used of government investment in the total capital investment (%) in period t.

AE_t = Total agribusiness sector export (₦'million) in period t.

VFI_{t-1} = Value of food imports (₦' Million) in period t-$_1$,

$DMER_t$ = Merger and acquisition consolidation policy period (0 = pre-merger and acquisition consolidation policy period and 1 = post-merger and acquisition consolidation policy period).

e_i = error term.

On a priori ground, it is expected that the coefficient estimates for $DMER_t$, AQ_t, RERt, CF_t, $AE_t > 0$; and EX_t , INF_t , PSQ_t, $VFI_{t-1} < 0$.

In this model $DMER_t$ was the focus variable.

$DMER_t$ = Merger and acquisition consolidation policy period (0 = pre-merger and acquisition consolidation policy period and 1 = post-merger and acquisition consolidation policy period).

e_i = error term.

On a priori ground, it is expected that the coefficient estimates for $DMER_t$, EX_t, $WP_t >$ 0; and $DUAC_t$,INF_t, POP_t, < 0.

In this model $DMER_t$ was the focus variable.

Export model

$AE_t = f$ (EXt , POP_t , IF_t , WP_t , $DUAC_t$, $DMER_t$, e_i)

Where,

AE_t = Total agribusiness sector export (₦'million) in period t.

EX_t = Exchange rate (₦/$) in period t.

POPt= Population (Million) in period t.

IF_t = Inflation rate (%) in period t.

WP_t = Average world price of agribusiness commodities (Naira /tonne) in period t;

$DUAC_t$ = Aggregate domestic utilization of agribusiness commodities (tonne) in period t.

RESULTS AND DISCUSSIONS

The results and discussion are presented in the order covering the response of agribusiness output to merger and acquisition consolidation policy, response of banks' credit to merger and acquisition consolidation policy and response of agribusiness export to merger and acquisition consolidation policy. The response of agribusiness output to merger and acquisition consolidation policy is presented in Table 1.

Table 1. The response of agribusiness output to merger and acquisition consolidation policy

Variable	Linear	Exponential++	Double-log	Semi-log
$DMER_t$	57.567(2.732)**	0.215(4.131)***	0.168(1.368)	46.533(1.308)
INF_t	0.187(0.687)	0.000(0.492)	-0.013(-0.360)	0.500(0.049)
$BCAA_t$	0.000(-1.529)	-1.34E-08(-2.513)**	-0.014(-0.184)	-3.796(-0.169)
$ADLR_t$	1.024(0.675)	0.003(0.762)	-0.041(-0.159)	6.281(0.083)
DOD_t	-0.005(-0.574)	-2.36E-05(-1.145)	-0.300(-1.311)	-97.813(-1.474)
$NASAV_{t-1}$	-0.062(-5.078)***	0.000(-6.891)***	-0.326(-2.750)**	-106.296(-3.087)**
POP_t	5.757(3.124)**	0.020(4.426)***	3.304(2.314)**	1078.771(2.602)**
VFI_{t-1}	0.000(0.759)	2.12E-06(1.444)	0.037(0.592)	11.659(0.643)
$RAINFALL_t$	0.139(4.255)***	0.000(5.736)***	0.631(2.665)**	193.728(2.819)**
RER_t	-0.083(-0.428)	0.000(-0.388)	0.146(2.388)**	42.337(2.380)**
$GCEA_t$	-0.517(-3.569)***	-0.002(-5.254)***	-0.042(-1.452)	-12.507(-1.498)
Constant	-554.879(-2.597)**	2.748(5.208)***	-11.008(-2.095)*	-5119.963 (-3.357)***
R^2	0.978	0.989	0.937	0.934
Adj R^2	0.947	0.974	0.849	0.844
F-Statistic	32.042***	65.326***	10.741***	10.347***
DW-test	1.663	1.680	1.843	1.929

Source: CBN authors' computation 2015

The exponential model was selected as the lead equation (++) based on the magnitude of the coefficient of multiple determinations (R^2) and the signs of the regression coefficients (as they conform to a priori expectations) and the number of significant variables. It can be inferred the model that 98% of the observed variation in agribusiness output were explained by the explanatory variables. The Durbin-Watson statistic test indicated no serial autocorrelation since there was no positive first-order serial autocorrelation at 1% probability level given DW (1.680) Du >(1.623). Merger and acquisition consolidation policy, value of banks loan to agribusinesses, period lagged value of national savings, population, rainfall and government capital investment to agribusiness sector were the significant variables that influenced agribusiness output in Nigeria within the study period. Merger and acquisition consolidation policy was the focus variable in this study and had a significant positive relationship with agribusiness output performance in Nigeria within the period under review. This implies that Merger and acquisition consolidation policy led to an increase in agribusiness output. By Merger and acquisition consolidation policy, most Nigerian banking institutions achieved cost efficiency through economies of scale. They diversified on the range of business activities they were involved and thus improved performance. According to [21] and [18], banks that participated in merger and acquisition consolidation activities perform higher than before because future dividends and earning streams are expected to rise and subsequently improve efficiency. This enables most weak banks who if not for merger *vis-a-vis* consolidation policy would not have dared to venture into investment in real sector like the agribusiness sector due to its characteristic huge risk nature. As the level of banks investment in agribusiness enterprises increases due to merger and acquisition consolidation, the output from the agribusiness sector also increased. As a result, merger and acquisition consolidation policy in the Nigerian banking institutions led to an increase in agribusiness output in Nigeria within the reference periods. This finding is similar with the study of [5] and [15] who reported enhanced efficiency and performance of the financial sector in Nigeria during consolidation policy.

Value of banks credit allocation to agribusiness had a significant positive relationship with agribusiness output performance within the period under review. This implies that increase in the value of banks credit allocation to agribusiness led to an increase in agribusiness output. Agribusiness production is credit dependent. The extent of access to credit of a farm firm will influence its decision of how much land, labour, inputs and equipment required for agribusiness production, and will also influence its rate of adoption of new and improved systems of agribusiness production [11]. As a result, agribusiness output increased with increased value of bank’s loan to agribusiness sector. A lagged value of national savings had a significant positive relationship with agribusiness output performance within the period under review.

This implies that increase in national saving in the preceding year leads to increase in agribusiness output performance in the current year and *vice versa*. Previous year increase in national saving will make more cash to be available for investment in agribusiness sector in the current year and hence increase in agribusiness output. Population was positively related to agribusiness output an indication that agribusiness output increased as population increased and vice versa. Population in agriculture serves as the labour need to achieve a meaningful increase in agribusiness output. As more people engaged in agribusinesses the more the output of the sector. The result is not consistent with the findings of [12] and [3] who found population growth to be negatively related to agricultural output and posited that reducing the rate of desertion of farming caused by rural-urban migration is essential for increased agricultural productivity.

Rainfall had a significant positive relationship with agribusiness output performance within the period under review. This implies that increase in rainfall leads to an increase in agribusiness output. Nigerian agriculture is rainfall dependent. Increase in adequate and timely annual rainfall enables crops to grow and produce fruits. Increase in fruit production by crops will likely lead to an increase in agribusiness output, As a result agribusiness output increased as annual rainfall increased.

Government capital expenditure on agribusinesses was negatively related to agribusiness output. An indication that agribusiness output decreased as government capital expenditure increased. An increase in government capital expenditure on agribusiness is expected to culminate into an increase in the agribusiness output by creating an enabling environment for agribusiness production to strive through a reduced cost of production. However, diversion of government funds meant to serve as subsidy to agribusiness operators makes agribusiness production to deviate in growth as expected with the increase in government capital expenditure to the sector. Thus, the relationship between government capital expenditure and agribusiness output may probably be due to diversion of government funds meant to serve as subsidy to agribusiness operators by some individuals.

Response of banks' credit allocation to merger and acquisition consolidation policy in Nigerian banking institution

The regression results of the response of bank's credit allocation to agribusiness sector to merger and acquisition consolidation policy in the Nigerian banking institutions are shown in Table 2.

Table 2. The regression results of the response of bank's credit allocation to agribusiness sector to merger and acquisition consolidation policy in the Nigerian banking

Variable	Linear	Exponential++	Double-log	Semi-log
AIQ_t	-11333.77(-0.588)	-0.004 (-1.314)	-0.236(-0.237)	2687688.(0.505)
RER_t	-16813.35(-0.477)	0.002(0.722)	0.240(1.189)	366017.6(0.341)
EX_t	-172.8923(-2.539)**	-2.95E-05(-2.985)**	-0.104(-2.341)**	-415354.5(-2.257)**
CF_t	-8.253944(-0.636)	7.50E-06(5.126)***	1.510(2.749)**	2424190.(0.828)
INF_t	27208.70(2.745)**	0.002(0.413)	0.240(1.281)	1209688.(3.213)***
PSQ_t	1197525.(2.969)***	0.007(0.340)	0.950(0.353)	22592158(1.574)
AE_t	-2.595812(-0.221)	2.09E-06(2.949)**	0.144(1.625)	-377404.5(-0.308)
VFI_{t-1}	0.139364(0.002)	-1.01E-06(-0.071)	-0.058(-0.315)	902275.4(0.917)
$DMER_t$	6831196.(3.084)**	1.950(5.466)***	1.458(3.411)***	5807096.(2.551)**
Constant	2567001.(5.518)***	11.212(4.987)***	-10.652(-0.701)	-1.51E+08(-1.862)*
R^2	0.841	0.900	0.684	0.637
Adj R^2	0.827	0.881	0.660	0.601
F-Statistic	17.631***	111.722***	69.948	16.612
DW-test	1.996	2.014	1.973	2.252

Source: CBN authors' computation 2015

The exponential model was selected as the lead equation (++) based on the magnitude of the coefficient of multiple determinations (R^2) and the signs of the regression coefficients (as they conform to a priori expectations) and the number of significant variables. It can be inferred from the model that 90% of the observed variation in value of banks loan to agribusinesses were explained by the explanatory variables. The Durbin-Watson statistic test indicated no serial autocorrelation since there was no positive first-order serial autocorrelation at 1% probability level given DW (2.014) > Du (1.623).Merger and acquisition consolidation policy in the Nigerian banking Institutions, external reserve, capital formation and agricultural export, were the significant variables that influenced government credit allocation to agribusinesses in Nigeria within the study period.

Merger and acquisition consolidation policy was the focus variable in this study and had a significant positive relationship with government credit allocation to agribusinesses within the period under review. This implies that Merger and acquisition consolidation policy led to an increase in banks" credit allocation to agribusinesses in Nigeria. By Merger and acquisition consolidation policy, most Nigerian banking institutions achieved cost efficiency through economies of scale through diversification on the range of business activities they can involve for improved performance. Banks that participated in merger and acquisition consolidation activities perform higher than before because future dividends and earning streams are expected to rise and subsequently improve their capital base. As the capital base of the Nigerian banking institution increased due to merger and acquisition consolidation, their lending capacity also increases. This increases the level of banks credit to agribusiness enterprises. As a result merger and acquisition consolidation policy in the Nigerian banking institutions led to an increase in government credit allocation to agribusinesses in Nigeria. Government credit allocation to agribusinesses in Nigeria responded positively to such other factors as capital formation, agricultural export and external reserve accumulation. This implies that increase in capital formation, agricultural export and external reserve accumulation leads to increase in banks' credit allocation to agribusiness sub-sectors in Nigeria within the period under review.

Response of agribusiness export growth to merger and acquisition consolidation policy in Nigerian banking institutions.

The regression results of the response of agribusiness export growth to agribusiness sector to merger and acquisition consolidation policy in the Nigerian banking institutions are shown in Table 3.

Table 3. Estimation of the response of agribusiness export growth to merger and acquisition consolidation policy in the Nigerian banking institutions (1995 -2014)

Variable	Linear	Exponential++	Double-log	Semi-log
DMER	-142180.7(-2.848)**	-0.324(-0.996)	-0.464(-1.444)	-145677.3(-2.665)**
Exchange Rate	-2066.232(-3.403)***	-0.009(-2.175)**	-0.468(-2.060)*	-128478.1(-3.318)***
Av. World Price	-128.4861(-1.297)	0.000(0.378)	0.271(1.352)	-43734.83(-1.283)
Inflation	1469.218(1.699)	0.004(0.778)	0.138(0.959)	21296.15(0.871)
ADUCR	-5125.385(-2.428)**	0.019(1.393)	0.725(0.952)	208824.2(1.610)
Population	-21657.39(-8.082)***	0.034(1.920)*	8.332(4.564)***	2873425.(9.244)***
Cap. Formation	-0.320235(-1.017)	0.000(2.641)**	0.359(0.735)	-170086.2(-2.043)*
Constant	-2564292.(-7.942)***	4.324(2.053)*	-36.162(-3.934)***	-11669007(-7.455)***
R^2	0.963	0.858	0.758	0.855
Adj R^2	0.942	0.833	0.733	0.829
F-Statistic	44.944***	38.831***	39.025***	36.283***
DW-test	2.159	2.013	2.032	2.137

Source: Computed by the author from CBN (2014) statistical bulletin and Annual Report and Statement of Accounts for the year Ended 31st December, 1995- 2014. ***, ** and * represent1%, 5% and 10% significance levels respectively. Figures in brackets are t- values. $^{++}$represents lead equation.

The linear model was selected as the lead equation (++) based on the magnitude of the coefficient of multiple determinations (R^2) and the signs of the regression coefficients (as they conform to a priori expectations) and the number of significant variables. It can be inferred from the model 96.3% of the observed variation in value of banks loan to agribusinesses was explained by the explanatory variables. The Durbin-Watson statistic test indicated no serial autocorrelation since there was no positive first-order serial autocorrelation at 1% probability level given DW (2.159) > Du (1.623).

Merger and acquisition consolidation policy in the Nigerian banking institutions was the focus variable in this study and had a significant negative relationship with agribusiness export growth in Nigeria within the period under review. This implies that Merger and acquisition consolidation policy in the Nigerian banking institutions has not led to an increase in agribusiness export growth in Nigeria. This finding is not consistent with *a priori* theoretical expectations. Earlier in this study, merger and acquisition consolidation policy in the Nigerian banking institutions had a positive influence on agribusiness output in Nigeria, likewise is expected to grow agribusiness export as well.

The deviation from this expectation may be adjudicated to be due to population growth in the country that increases geometrically in relation to food agribusiness production the increases algebraically as postulated by Malthusian theory. The inability of the country to export more of its agribusiness products as a result of merger and acquisition consolidation policy in the Nigerian banking Institutions means that there is gap existing between agribusiness demand and supply and that merger and acquisition consolidation policy in the Nigerian banking institutions have not driven the growth in the agribusiness sector to a substantial height that could translate into increased growth in agribusiness export. As a result, agribusiness export growth did not response to merger and acquisition consolidation policy in the Nigerian banking Institutions within the period under review.

Agribusiness export growth in Nigeria responded negatively to such other factors as exchange rate, rate of domestic utilization capacity for agribusiness commodities and population. This implies that increase in exchange rate, rate of domestic utilization capacity for agribusiness commodities and population leads to decrease in agribusiness export growth in Nigeria within the period under review and *vice versa.*

CONCLUSIONS

The study showed that merger and acquisition consolidation policy, value of banks loan to agribusinesses, lagged value of national savings, population, rainfall and government capital investment to agribusiness sector specifically affected agribusiness output in Nigeria positively.

Further, Merger and acquisition consolidation policy, external reserve, capital formation and agricultural export significantly and incrementally affected banks' credit allocation to agribusinesses positively. The various analysis carried out in this study reveals that merger and acquisition consolidation policy enhanced agribusiness sector performance in Nigeria within the reviewed study.

This consequential analysis supports the notion of consolidation policy through merger and acquisition in the Nigerian banking institutions. Agribusiness sector performance fared better both in output performance and export growth.

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THE ENERGY MINIMIZATION AND THE COST REQUIREMENTS FOR THE POTATO RESIDUES REPROCESSING

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Abstract

Field crop residues have become an urgent problem for the Egyptian farmer. Total cultivated area with this crop in Egypt, 189,000 hectare and the estimated quantity of haulm potatoes is about 1,575 Tg with an average of 8.3 Mg/hectare of haulm potato. Varied techniques were used for cutting waste of field crop, and the mechanical shredder residue for handling and use of these wastes were analyzed in order to reduce the size of the waste molecules to fit the various aspects of its uses. To optimize the operating parameters of the performance of farm residues it was used the cutting machine and it was established the minimum cost, power and energy requirements for produce animal feed raw materials from potato haulme. The performance of the machine units was measured under the following parameters four levels of drum speed of 25.13, 30.14, 35.17 and 40.19 m/s (1,000, 1,200, 1,400, and 1,600 rpm), three feed rates of 600, 800, 1000 kg/h, two number of knives on the cutting cylinder from (68 to 48). The performance of the cutting machine unite was taking into consideration machinery productivity, percentages of softness degree, cutting efficiency, fuel consumption, power, energy, and cost analysis. The optimum results and parameters for cutting machine untie when using drum speed 1,600 rpm, 1,000 kg /h feeding rates, and 68 number of knives.0.985 Mg/h productivity, 19,123 kW power, 19,414 kW.h/Mg energy, 6,046 l/h fuel consumption, 99 % cutting efficiency, 85% percentages of softness degree, and 9,850 l.E/h cost analysis.

Key words*: cost, energy requirements, field crop, minimize, residues*

INTRODUCTION

Field crop residues are a problem still facing the Egyptian farms, especially after the harvesting of field crops. It is estimated of about 18-25 Tg per year. The estimated area of potatoes crop in Egypt about From grown potato crop through three lugs (Winter - Summer - Indigo) which produced about 2 Tg of potatoes haulm **(Central Administration for Agricultural Economics, Ministry of Agriculture and Land Reclamation, Egypt 2015).**

The quantities of crop residues in Egypt are estimated about 18.7 million ton/year, 53 % of which (9.91 million ton) are directly burned. Also they mentioned that burning of cotton residues (1.24 million ton/year) causes a loss of 532,000 equivalent ton of hydrocarbon fuel (1,806 million LE). (based on mean yield of 0.43 ton/fed).[1]

The different machine reciprocating mowers rotary mower, shredder and cutting machine some field crops. Machine performance was evaluated in storms of field capacity, cutting height, cutting energy and optioned cost. frame residues.[5]

Developing of the performance of cutting knives in crop residues shredder. The maximum percentage of < 2 cm cutting length of 94.0 % and 93.3 % were obtained at cutting peed of 1,500 rpm and moisture content of 30% and 22.0 % (w.b) for cotton stalks and rice straw respectively, the minimum value of useful power 1.10 KW and 1.0 KW were obtained at cutting speed of 900 rpm and moisture content of 30 % and 22.0 % for cotton stalk and rice straw respectively. The unit energy from (0.85& 1.50 kW.h/Mg) to (0.80 & 1.40 KW.h/Mg) with machine after modification at moisture content of 30.0 % and 22.0 % (w.b.) for cotton stalks and rice straw, respectively.[2]

A compatible unit to produce Rabbit feed pellets formula from black seed meal residues in one operation The compatible was evaluated under operating parameters including four different retention time and four L/D ratio The optimum results compatible unit were die L/D ratio of 5.5:1, 3.5min of mixing retention time, and rollers teeth width of 10mm. give 427.87 kg/h production rate 37.96 kW.h/ton energy requirement.88.29% mixing efficiency, 0.671gm /cm^3 bulk density, 93.21% durability, 49.01N hardiness, and 566.36 LE/ton using residues formulation [3]

Minimize energy and costs in weeding and fertilizing processes for fiber crops in small farms. The experiment results reveled that the manufactured machine decreased energy and increased effective field capacity and efficiency under using speed 2.2 Kmlh at soil moisture content average 20%.[4]

The aims of this study were to remove the potatoes crop residues especially after harvesting and prepare, evaluate the performance of cutting machine to produce raw materials for animal feed and optimize the operating parameters to minimize cost, power and energy requirements

MATERIALS AND METHODS

The main experiments were carried out at the Experimental Farm of Agricultural Research Station, Gharbia Governorate during of 2013-2014 seasons to test and evaluate the performance of cutting machine of potatoes haulm under Egyptian conditions.

Potato Scientific Name**:** *Solanum Tuberosum***.**

Haulm of potato: was used as raw materials to produces animal feed after drying and cutting as showing in Fig.1.

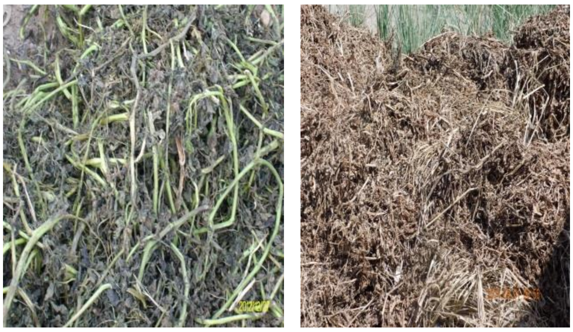
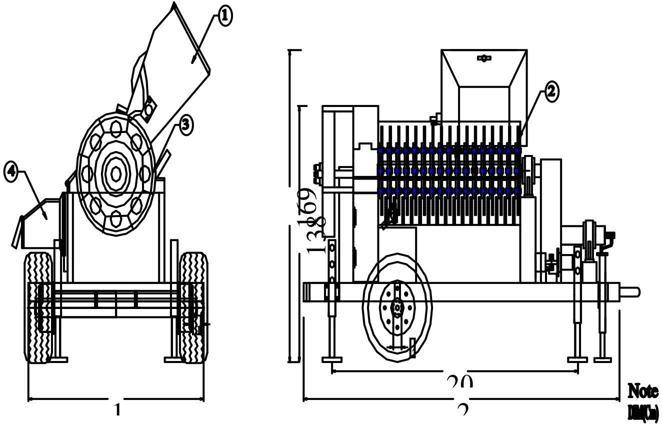


Fig. 1. Potato haulm Before and after drying from 24-12% moisture content(w.b)

Root Cross: Root cross graduated in groups arise in part on the bottom surface of the soil from the stalk these rooted in thirty stomata top of the soil.

Machine: Source of power using 35 hp.

Fig.2 illustrated the specific at mm and dimensions of the main components of chopping and grinding equipment.



1- Feeding orifice. 2- Knife. 3- Drum. 4- Excite gate.

Fig. 2. Side view and elevation view of chopping and grinding equipment.

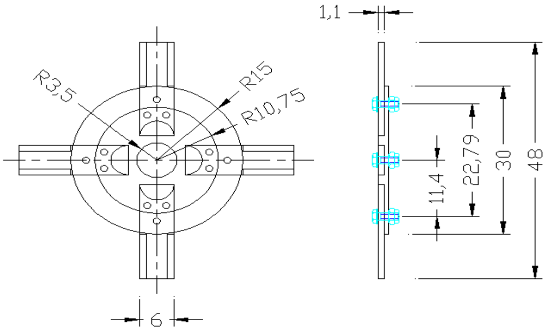


Fig. 3. The type of knives of chopping and grinding equipment.

The experiment was carried to evaluate the performance of cutting machine and optimize the operating parameters during cutting processes.

Experimental Procedures: The engineering variables were used:

- Drum speeds of 25.12, 30.14, 35.17, and 40.19 m/s (1,000, 1,200, 1,400 and 1,600 rpm).
- Feed rate of 600, 800, and 1,000 kg/h.
- Number of knives 48 and 68.

Measurements:

Evaluation of cutting machine performance taking into consideration the following indicators.

-Percentage of Softness Degree:

Crop residues were used as a raw material for producing animal feed, the crop residues drayed by sun for 3 day. Before using to less the 23% moisture with 12%. Six sieves mechanical analysis of square openings of 1.4, 3, 3.35, 3.75, 7, and 10 mm.

-Determination of productivity (Mg/h):

Machine productivity was determined by the following equation:

$$M_p = w_s/t \qquad \text{kg/ h}$$

Where:

M_p : machine productivity , kg/h,
W_s : machine Raw materials out let, kg
T : time consumed to cutting samples, h.

-Cutting Efficiency (%):

Cutting efficiency were estimated using the following equation:

$$\zeta = w_s / w_t \times 100$$

Where :

ζ: cutting efficiency %.,
W_s : machine Raw materials out let, kg.
W_t: mass of input delivered to cutting unit kg .

Energy requirement (kW.h/kg):

Energy regalement may be calculated by using the following equation:

Energy=power consumed /productivity

-Cost Analysis:

Total Hourly cast (THC) may be calculated as following**:**

THC = (p/h) (l/a + l/2 + t + r) + (1.2 ×w ×s × f) + m/144 Where:
THC = Total Hourly cost, LE/h,
P = Purchase price of machine, LE,
h = Working hours per year, h/yr,
a = Expected machine life, years.
i = interest rate,(10%), t = taxes (3%)
r = repair and maintenance ratio (5%).
w = power, kW, f = fuel price, LE/l,
s = specific fuel consumption, l/kW.h,
m = operator monthly salary, LE, 1.2 is a factor to take care of oils, grease, etc.
144 = is operation hours per month.

RESULTS AND DISCUSSIONS

Effect of drum speed, feeding rate and number of knifes on the percentage of softness degree:

The data illustrated in Fig. 4 indicated that increasing drum speed and feeding rate decreasing the percentage of softness degree. When reduced knifes about 48 and 600 kg/h feeding rate), and drum speed at 1,000 rpm,

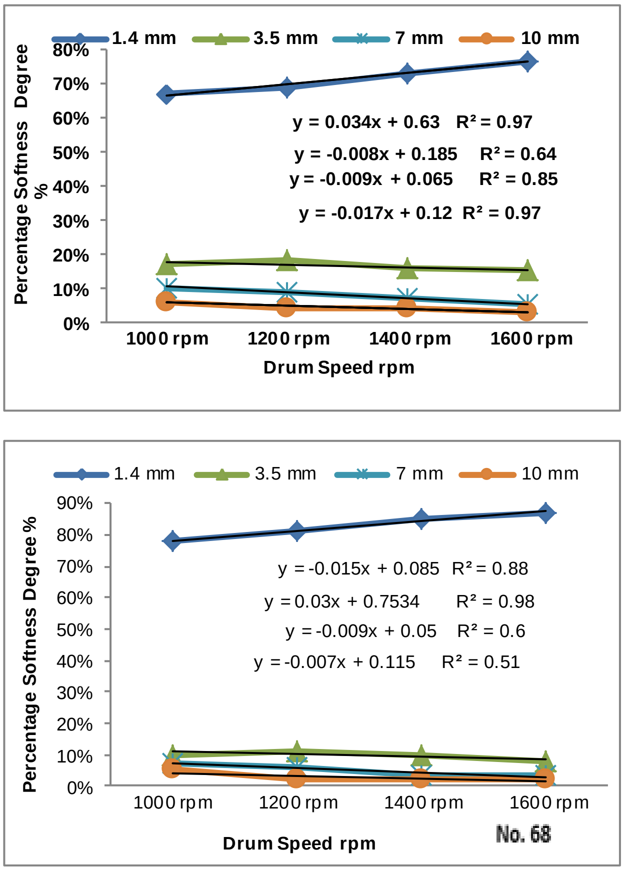


Fig. 4. Effect of drum speed and number of knifes (48 and 68 respectively) on the percentage of softness degree at constant feeding rate about 600 kg/h.

The percentage of softness degree was decreased from 67, 17, 10, and 6%, with hole of sieves 1.4, 3.5,7 and 10 mm, respectively.

Linear regression analysis was performed to identify the relationship percentage of softness degree between drum speed, feeding rate and number of knifes. The results showed positive relations in percentage of softness degree with increasing drum speed, feeding rate and number of knifes.

Effect of drum speed, feeding rate and number of knifes on the machine productivity:

Data illustrated in Fig**.** 5. Results showed that the effect of drum speed on the productivity at 48 number of knifes and 600 kg/h feeding rate, by increasing the drum speed from 1,000 to 1,600 rpm, the machine productivity increased from 0.528 to 0.580 Mg/h, by increasing the drum speed from 1000, 1200, 1,400 and 1,600 rpm, increase the machine productivity from 0.528, 0.552, 0.558, and 0.580 Mg/h, respectively. While the results showed that the effect of drum speed on the productivity at 68 number of knifes and 600 kg/h feeding rate, by increasing the drum speed from 1,000 to 1,600 rpm, the machine productivity increased from 0.552 to 0.570 Mg/h, by increasing the drum speed from 1000, 1200, 1400 and 1600 rpm, increase the machine productivity from 0.552, 0.558, 0.565, and 0.570 Mg/h, respectively.

Linear regression analysis was performed to identify the relationship productivity between drum speed, feeding rate and number of knives. The results showed positive relations in productivity with increasing drum speed, feeding rate and number of knifes.

Effect of drum speed, feeding rate and number of knifes on the machine cutting efficiency :

The data illustrated in Fig**.** 6 showed that the effect of drum speed on the cutting efficiency at 48 number of knifes and 600 kg/h feeding rate, by increasing the drum speed from 1,000 to 1,600 rpm, the machine cutting efficiency increased from 88 to 97 %, by increasing the drum speed from 1,000, 1,200, 1,400 and 1,600 rpm, increase the machine cutting efficiency from 88, 92, 93, and 97%, respectively. While the results showed that the effect of drum speed on the cutting efficiency at 68 number of knifes and 600 kg/h feeding such as feeding rate and number of knifes 48 to 68 respectively.

rate, by increasing the drum speed from 1,000 to 1,600 rpm, the machine cutting efficiency increased from 92 to 95 %, by increasing the drum speed from 1,000, 1,200, 1,400 and 1,600 rpm, increase the machine cutting efficiency from 92, 93, 94, and 95 %, respectively.

Effect of drum speed, feeding rate and number of knifes on the machine energy requirements:

Results showed in Fig**.** 7 indicated that increasing drum speed and feeding rate increasing the machine energy requirement.

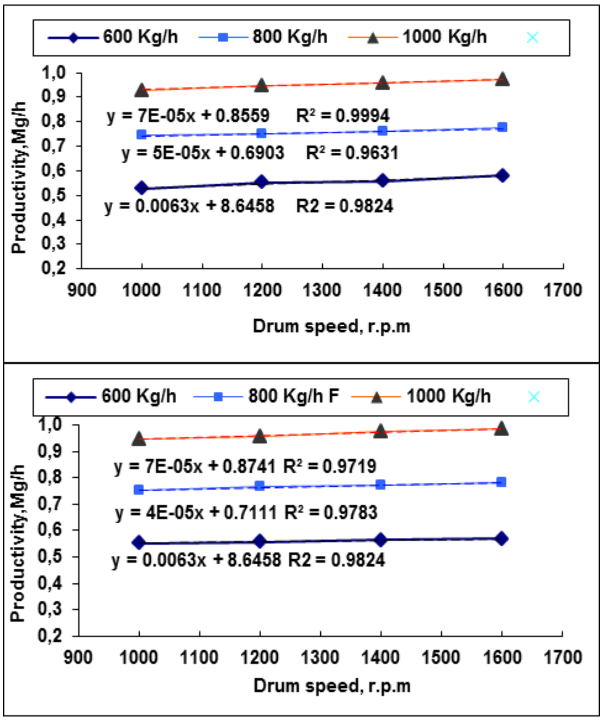


Fig**.** 5. The effect of drum speed on the productivity at 48 number of knifes and 600 kg/h feeding rate.

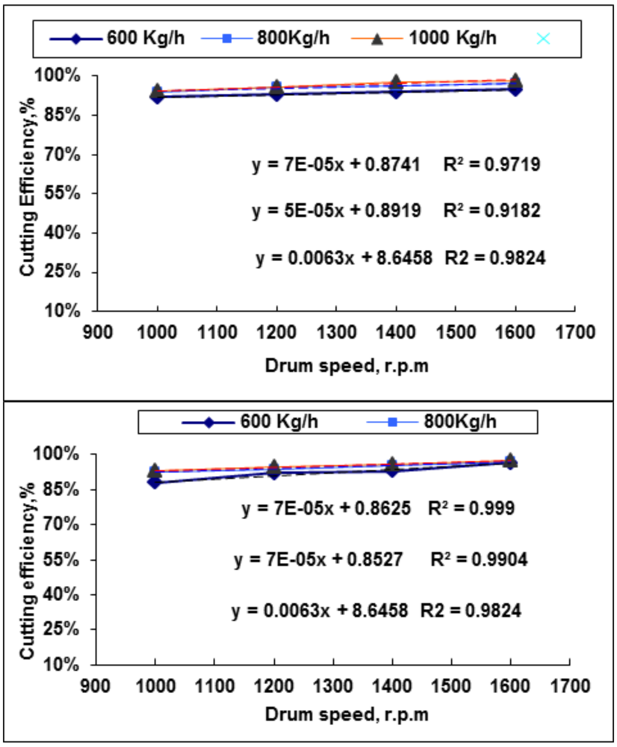


Fig. 6. The effect of drum speed on the machine cutting efficiency , feeding rate and number of knifes 48 to 68 respectively.

Results showed that the effect of drum speed on the energy requirement at 48 number of knifes and 600 kg/h feeding rate, by increasing the drum speed from 1,000 to 1,600 rpm, the machine energy requirement increased from 26,177 to 31,360 kW.h/Mg, by increasing the drum speed from 1000, 1200, 1,400 and 1,600 rpm, increase the machine energy requirement from 26,177, 28,211, 30,188, and 31,360 kW.h/Mg, respectively.

While the results showed that the effect of drum speed energy requirement at 68 number of knifes and 600 kg/h feeding rate, by increasing the drum speed from 1,000 to 1,600 rpm, the machine energy requirement increased from 26,754 to 32,575 kW.h/Mg, by increasing the drum speed from 1,000, 1,200, 1,400 and 1,600 rpm, increase the machine energy requirement from 26,754, 29,442, 31,261, and 32,575 kW.h/Mg, respectively.

Linear regression analysis was performed to identify the relationship energy requirement between drum speed, feeding rate and number of knives. The results showed positive relations in energy requirement with increasing drum speed, feeding rate and number of knives.

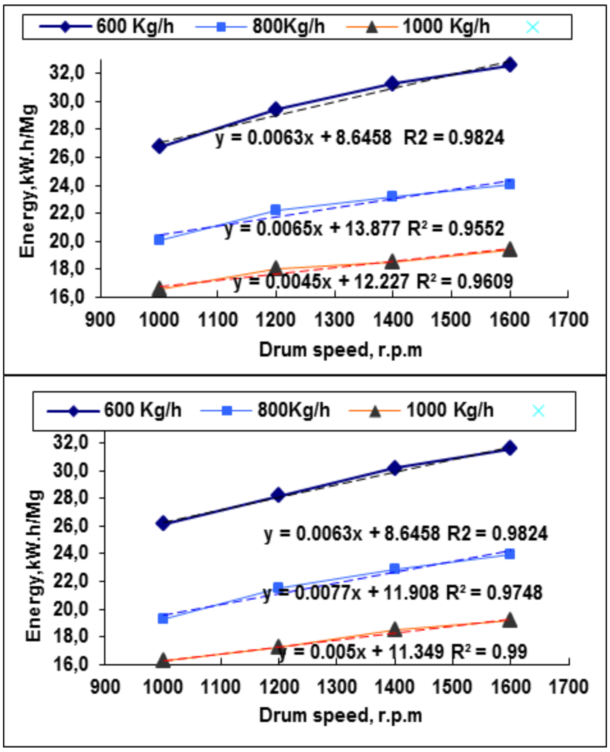


Fig. 7. The effect of drum speed on the machine energy requirement , feeding rate and number of knifes 48 to 68 respectively

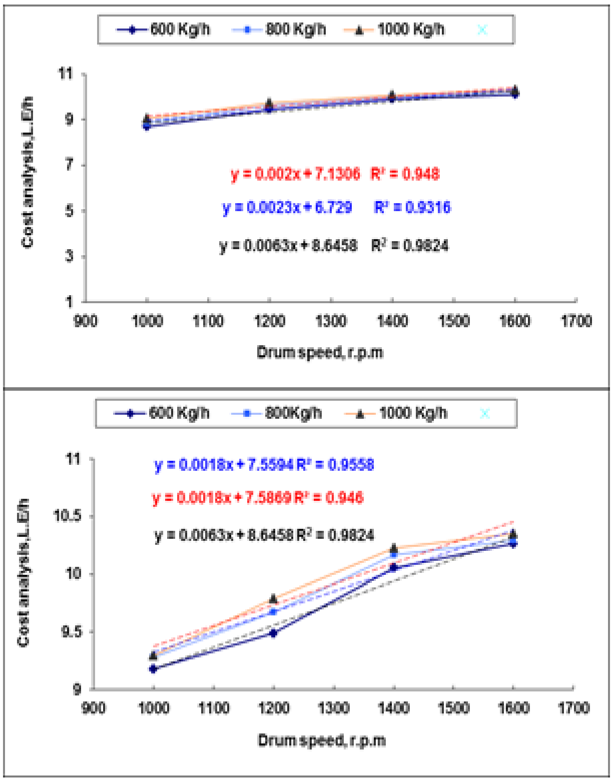


Fig. 8. The effect of drum speed on the machine cost analysis, feeding rate and number of knifes 48 to 68

Effect of drum speed, feeding rate and number of knifes on the machine cost analysis: Results from Fig. 8 showed that the effect of drum speed on the cost analysis at 48 number of knifes and 600 kg/h feeding rate, by increasing the drum speed from 1,000 to 1,600 rpm, the machine cost analysis increased from 8,696 to 10,109 L.E/h, by increasing the drum speed from 1,000, 1,200, 1,400 and 1,600 rpm, increase the machine cost analysis from 8,696, 9,453, 9,904, and 10,109 L.E/h, respectively. While the results showed that the effect of drum speed cost analysis at 68 number of knifes and 600 kg/h feeding rate, by increasing the drum speed from 1,000 to 1,600 rpm.

CONCLUSIONS

From this research, we can use the cutting machine after adjusted the machine performance to produce a raw materials from potato haulm as animal feed for different animal (rabets, dotes, crow and buffalo). The optimum data obtained leaded to minimize the cost and energy requirements.

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ROLE OF FINANCIAL SUBSIDIES ALLOCATED BY THE CAP TOWARDS SLOVENIAN FARMERS

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Abstract

Financial subsidies allocated by the European Union (EU) throughout the Common Agricultural Policy (CAP) have had a positive effect on the rural development in particular in less favoured rural areas. The Farm Accountancy Data Network is an useful tool in order to estimate the impact of payments allocated by the CAP on the farm net income in a sample of European farms. Before of European Union enlargement in 2004 Slovenian farmers have benefited of specific initiatives aimed at implementing the productive agrarian fabric. Findings have pointed out as financial subsidies allocated towards stayed behind rural areas have been indirectly correlated to the dependent variable farm net income, even if the usable agricultural surface is one of the most important variable acting predominately towards the level of farmer's income and economic efficiency.

Key words: *Farm Accountancy Data Network, rural development, disadvantaged rural areas, Slovenia*

INTRODUCTION

Since the early 2000s there has been the accession of Slovenia into the European Union consequence of its own transition of socio-economic context due to the collapse of the Communist regime and the development of a new open economy. Before becoming a new comer member state, part of the EU, lots of financial subsidies correlated to the pre-accession process have implemented the socio-economic fabric in rural areas even if the amount of financial subsidies allocated by the European Union and local administrations has been similar in financial terms to other European countries as the financial initiatives have been specifically addressed towards direct payments and financial aids allocated in favour of a balanced rural development economic growth [6] [8].

In general, Slovenian farms are characterized by small agrarian surfaces with an high level of specialization in some crops such as wine, fruit, pastures and forage. Features of Slovenian farms are completely changed as a consequence of the enlargement of the EU in 2004. In fact, before this transition time because of a small agricultural surface and a significant price support of agrarian productions, Slovenian farmers were characterised by an higher level of farm net income than other not subsidised farms [4] [5].

After the enlargement of the European Union, alpine agrarian regions in Austria and in Slovenia as well have tailored their National Rural Development Plan predominately in favour of agri-environment actions and other initiatives addressed both in order to implement organic productions in farms and also in supporting less favoured rural areas aimed at reducing the out-migration from the countryside [3] [4].

The process of transition in the productive agrarian model in Slovenian countryside has been a direct consequence of the development of a post productivism model in the agricultural European model and a significant process of structural reform in its national legislative context in order to strengthen the national agriculture and food-industry [4] [5] [6] [7].

Aim of the research. The purpose of this study was to asses, using a quantitative approach, the impact of financial subsidies allocated by the Common Agricultural Policy in 10 year time, from 2004 to 2023, on the level of farm net income in Slovenian farms.

In this paper it has used the dataset published by the Farm Accountancy Data Network in a sample of Slovenian farms. In fact, in order to assess the impact of the Common Agricultural Policy on farmers in different European Countries, the European Union, since the early 1960s, by the Council Regulation number 79 published in 1965 has established an analysis on a sample of farmers through the foundation of the Farm Accountancy Data Network (FADN). According to the European Commission, this later dataset is an annual survey which covers approximately 80.000 farms and a population of 5.000.000 farms located in all countries part of the European Union able to represent more than 90% of utilized agricultural area (UAA). Farm Accountancy Data Network dataset also represents almost 90% of the total European agricultural production.

MATERIALS AND METHODS

In order to investigate and to assess the main relationships among the dependent variable farm net income in Slovenian farms and the independent variables as subsidies allocated by the second pillar of the Common Agricultural Policy (Less Favoured Areas subsidies or LFA), Utilized Agricultural Areas, environmental payments, labour input, total assets and net investments since 2004 to 2013, it has used a multiple regression model, estimating parameters by the Ordinary Least Square.

The estimation of regressors has used the open source software GRETL 1.8.6 and in its algebraic form of matrix, the multiple regression models can be so expressed [9]:

$$y = X\beta + \varepsilon$$

where y is a dependent variable and ε is the statistical error but both are vectors with n-dimensions; X is an independent variable which has a dimension n x k.

In analytical terms, the model of multiple regression in its general formulation can be written in this way [1] [2] [9]:

$$y = \alpha_0 + \alpha x_1 + \beta x_2 + \gamma x_3 + \delta x_4 + \varepsilon_{jt}$$

y is the farm net income in Slovenian farms
α_0 constant term
x_1, x_2, x_3, x_4 independent variables
α, β, γ, δ estimated parameters of the model
ε_{jt} term of statistic error.

Basis assumptions, to use a multiple regression model, are [1] [2]:

1) statistic error u_i has conditional average zero that is $E(u_i|X_i) = 0$;
2) (X_i, Y_i), $i = 1 \ldots\ldots n$ are extracted as distributed independently and identically from their combined distribution;
3) X_i, u_i have no fourth moment equal to zero.

Table 1. Descriptive statistics of Slovenian farms part of FADN dataset over the time 2004-2013

Variable	Mean	Std. deviation	Min	Max
Usable Agricultural Areas (ha)	10.65	0.426	10.17	11.57
Farm Net Income (€)	5,930.70	1,248.92	3,200	7,107
Less Favoured Area payments (€)	1,108.9	47.132	1.041	1,186
Rural Development Funds subsidies (€)	2,969	710.164	1,520	4,075

Source: Own calculation on data FADN published on http://ec.europa.eu/agriculture/rica/database/database_en.cfm

There is no correlation among regressors and random noise if the value between *β* expected and *β* estimated is the same; in order to analyze if there is also heteroscedasticity on standard errors in the multiple regression model, it has used White's test on the error terms [9].

Table 2. Main correlations at a level of 10% of significance in some variables investigated in Slovenian farms over the time 2004-2013

	Usable Agricultural Areas	Farm Net Income	Less Favoured Area payments	Rural Development Funds Subsidies
Usable Agricultural Areas	1.00	n.s.	n.s.	n.s.
Farm Net Income	n.s.	1.00	n.s.	n.s.
Less Favoured Area payments	n.s.	- 0.565	1.00	n.s.
Rural Development Funds subsidies	0.589	n.s.	n.s.	1.00

n.s. not significance

Source: Own calculation on data FADN published on http://ec.europa.eu/agriculture/rica/database/database_en.cfm

RESULTS AND DISCUSSIONS

Findings using the FADN dataset have pointed out as the Slovenian farms are characterised in average by 10 hectares and the values of usable agricultural areas are in a range that does not overcome 11 hectares with a poor level of farm net income lower than 11.000 Euro and a significant level of financial subsidies allocated by the National Rural Development Plan (Tab. 1). Focusing the attention on the variable financial subsidies allocated by the National Rural Development Plan one third of payments is made by financial aids disbursed by the Common Agricultural Policy towards less favoured rural areas.

Table 3. Spearman's test results of some variables over the time 2004-2013.

	SOC	CP	EP	DP
SOC	1.00	n.s.	n.s.	n.s.
CP	n.s.	1.00	n.s.	n.s.
EP	n.s.	n.s.	1.00	n.s.
DP	-0.67**	-0.93**	n.s.	1.00
UAA	n.s.	-0.92**	n.s.	0.83**
FNI	n.s.	n.s.	n.s.	n.s.
LFA	n.s.	n.s.	n.s.	n.s.
RDP	n.s.	-0.66	0.62*	n.s.
	UAA	**FNI**	**LFA**	**RDP**
SOC	n.s.	n.s.	n.s.	n.s.
CP	n.s.	n.s.	n.s.	n.s.
EP	n.s.	n.s.	n.s.	n.s.
DP	n.s.	n.s.	n.s.	n.s.
UAA	1.00	n.s.	n.s.	n.s.
FNI	n.s.	1,00	n.s.	n.s.
LFA	n.s.	-0.56**	1.00	n.s.
RDP	0.58*	n.s.	n.s.	1.00

10% of significance; ** 5% of significance; n.s. not significance

Source: Own calculation on data FADN published on http://ec.europa.eu/agriculture/rica/database/database_en.cfm

Spearman's test correlating variables about financial subsidies allocated by the CAP and farm net income since 2004 to 2013 has highlighted, with a level of significance lower than 10% as there is an indirect correlation between the variable farm net income and financial subsidies allocated towards stayed behind rural areas (Tab. 2).

Addressing the analysis towards the investigated variables a direct correlation has also been pointed out between the variables usable agricultural areas and total financial subsidies allocated by the National Rural Development Programme in terms of payments disbursed in the first and second pillar of the Common Agricultural Policy (Tab. 2).

Implementing the variables investigated such as subsidies on crops (SOC), compensatory payments (CP), environmental payments (EP), decoupled payments (DP), usable agricultural areas (UAA), farm net income (FNI), less favoured area payments (LFA) and total payments allocated by the Rural Development Funds (RDP) in the Spearman's test, introducing also a further constraints as the level of significance of 5%, findings have pointed out a direct correlation between total paid crop subsidies and decoupled payments (Tab. 3).

The main results in the Spearman's test with a level of significance of 5% have highlighted an indirect correlation among the variables Utilized Agricultural Area and compensated payments and also between the variables financial subsidies allocated by the Rural Development Plan and compensated payment as well.

Table 4. Main results in the multiple regression model. Dependent variable Farm Net Income

	Coefficient	Std. error	t value	p-value	significance
Constant	-6110.17	2495.77	-2.448	0.017	**
Usable Agricultural Areas	478.687	267.059	1.7924	0.078	*
Labour input	1.83483	0.90129	2.0358	0.046	**
Total assets	0.03550	0.01833	1.9366	0.057	*
Net Investment	0.565803	0.13043	4.3377	0.00006	***
Less Favoured Area payments	-6.84684	1.5902	-4.305	0.00006	***
Rural Development Funds subsidies	1.26003	0.6512	1.9347	0.057	*
Environmental payments	-1.24406	1.1412	-1.090	0.280	n.s.

10% of significance; ** 5% of significance; *** 1% of significance; n.s. not significance

Source: Own calculation on data FADN published on http://ec.europa.eu/agriculture/rica/database/database_en.cfm

Main results in the multiple regression model have pointed out as the dependent variable farm net income is correlated directly to the variables Usable Agricultural Areas, labour input, total assets and payments allocated by the first and second pillar of the Common Agricultural Policy (Tab. 4). By contrast, financial subsidies allocated towards stayed behind rural areas are indirectly correlated to the dependent variable farm net income corroborating the hypothesis according to which small farms in less favoured areas produce a poor level of income and hence they need a significant economic support aimed at contrasting the out emigration from the Slovenian countryside.

The multiple regression model has pointed out as errors are normally distributed and there is not autocorrelation; the model also fits well with the purpose of the investigation due to values of R^2 and adjusted R^2 equal to 0.84 and 0.83.

CONCLUSIONS

A positive role of financial subsidies allocated by the Common Agricultural Policy towards less favoured Slovenian farms has been pointed out; hence, it is important for a well development of rural areas to support financially small farms reducing the emigration from the countryside and impoverishment of rural areas.

Summing up, it is important to implement the financial amount allocated in favour of stayed behind rural areas able to contrast the out-migration even if it is fundamental to put in direct relation this financial support to measures able to implement the diversification in farms by the agrotourism, rural tourism and other activities deeply rooted to the rural space and rurality. This is particularly true towards enterprises characterized by young farmers able to make the most of new opportunities in order to diversify farmers's activities.

National Rural Development Plan initiatives should be addressed to implement the agrarian capital with positive impacts on the technical and economic efficiency as a consequence of a growth of enterprise's specialization. In fact, more assets and labour inputs are used, with a direct impact on the technical efficiency, higher is the level of farmer's income. The Rural Development Plan, throughout also the LEADER initiative, is one of the most important or rather maybe the unique tool in order to support these measures of socio-economical growth in rural areas by diversification in farm's activities.

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DETERMINANTS OF WOMEN PARTICIPATION IN LIVESTOCK PRODUCTION IN MANGU LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA

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Abstract

This paper determined women participation in livestock Production in Mangu local government area of Plateau State, Nigeria. Simple random sampling was used to select 90 women livestock farmers. Descriptive statistics, Participation Index and Multiple Regression Analysis were employed to analyse the data. The regression results revealed that extension contact was significant ($p<0.01$) and positive, while age and education ($p<0.01$) and years of experience ($p<.0.05$) were significant factors influencing women participation in livestock production although negative. Poultry, swine and goat production raked first, second and third respectively. The result further shows that the coefficient of multiple determinations (R^2) was 0.554, this indicates that 55.4% of the variation in women participation is accounted for by the explanatory variables included in the model. The study recommends that the women should be more capacitated in terms of support through engaging them more meaningfully on economic activities of not only the family but in decision making on matters affecting women. Also the training need of women participation in livestock production should be identified and also soft capital should be provided at the affordable and right time.

Key words: *assessment, determinants, livestock production, participation, women*

INTRODUCTION

The role of women in livestock production has either been ignored or underestimated (IFAD 2007) [4]. In the livestock sub sector in particular, men have always been the target of the extension agents despite the indispensable labour provided by the womenfolk. Men operating homestead livestock farms would be saddled with more work than they can handle. Even though there is no consensus on quantifying the role of women in livestock production, there is clear indication that their contribution is quite significant (Jothilakshmi *et al.*, 2009) [5], however, this contribution go unrecognized. Women seem to be relegated to the level of housewives, a situation where women restricted to staying at home tendering the livestock mostly owned by the men. While the men look for white collar jobs, the women are mostly engage in farm work which includes livestock.

It is amazing to note that these women are across the ages of teenagers, middle to old age implying that, this is a general trend within the study area. With most women engaging in this venture, it is clear that most of them don't own the farms, which is not unlikely due to traditional ownership of land and lack of education. More so, women are called upon to perform men's livestock responsibilities much more often than the reverse, with a corresponding increase in their work load (IFAD, 1994) [3].The essential point is that women usually do a great deal of work in livestock management initiatives frequently ignore or underestimated. The economic contribution by women have not only been underestimated and unrecognized but very little has actually been written and known about what women do in different sectors of the economy and particularly in agricultural sector (World Bank 2003) [9].It is from this background that the following research questions emanated.

Improved income of women is a parameter of security in the area of food, good nutrition, education and health care of children in the family. Studies in Africa, Asia and Latin America have shown that women income are more strongly associated with improvement in children health and nutritional status are men's income (Quisumbing *et al;* 1995) [8].The men in contrast, retain discretionary control over a higher proportion of their own incomes for personal expenditures. Female income share has been shown to have a positive and significant association with household caloric availability, household budget shares of medical care and child's schooling. The evaluation of women farmer in livestock production with the aim to identify factors that enhance productivity and challenges is imperative.

Objectives of the paper have been the following ones: (i)to identify the types of livestock kept by women livestock farmers, and (ii) to identify the determinants of women participation in Livestock production

MATERIALS AND METHODS

The study area. The research was carried out in Mangu Local Government Area, Plateau State, Nigeria. Mangu is a semi-urban settlement with a huge farming population and is located in Plateau Central Senatorial at 9°31′ N 9°06′E and has a population of 294,931 people and covered a total area of 1,653km^2 (638 sq miles) (NPC, 2006) [6]. It is about 77 km south of the state capital (Jos) and comprised of nine (9) districts namely; Ampang, Gindiri, Kerang, Kombum, Langai, Mangun, Mangu, Panyam, and Pushit. The climate and soil conditions of the area are suitable for growing varieties of crops such as; acha, guinea corn, maize, millet, rice, wheat, and tuber crops such as cassava, Irish potatoes, sweet potatoes, yam, etc. The Local Government Area is located within the Northern Guinea Savannah and the climate is near temperate and could be compared to the weather found in Jos, with an average temperature of between 18^o and 22 °C. The coldest weather is between December and February, while the warmest temperatures usually occur in the dry season months of March and April. The mean annual rainfall varies from 131.75 cm (52 in) in the southern part to 146 cm (57 in) on the Plateau. The highest rainfall is recorded during the wet season months of July and August. The major languages spoken in the area include, Mwaghavul and Pyem (Plateau State Information and Communication Development Agency, PSICDA, 2015) [7].

Sampling and sample selection. A total of ninety (90) livestock women farmers were selected for the research. Primary data was generated using structured questionnaire that was administered to the respondents. Multi-stage sampling technique was adopted. In the first stage, one village from each of the nine administrative districts was selected and this gives like nine (9) villages. The second stage involves purposive selection of 10 livestock farmers from each of the selected villages to give a total sample size of ninety (90) and this formed the sample for the research.

Data Analysis. Simple descriptive statistics and multiple regression analysis (ordinary least square) were employed and used in order to achieve the two objectives. The model is specified as below:

$Y = a + b_1X_1 + b_2X_2 + b_3+X_3 + b_4X_4 + U$

Y = Participation Index of women livestock farmers

X_1 = Age (years)

X_2 = Years of experience in livestock production (years)

X_3 = Level of education

X_4 = Extension visit (No of contact/years)

$b_1 – b_4$ = Regression coefficients

a = Constant term

U = error term

RESULTS AND DISCUSSIONS

Distribution of respondent according to types of livestock kept. The various types of livestock kept by the respondent in the study area are captured in Table 1. The result reveals that majority of the women in livestock production kept poultry as their major livestock enterprise. This was followed by swine and goat production. This finding tallies with that of Ayoade *et al*, (2009) [1] and Beth (2001) [2] who explain that women claims smaller species of animals such as poultry, sheep, goat are cheaper to raise and requires lesser initial cost of investment that the larger ruminants, namely; cattle, camel or buffalo. Though, the profit from the preferred enterprises are smaller when compared to the larger animals, but the rate of growth/multiplication is faster and also, some of the animals may give birth to up to four (4) young one at a point and if compared to the larger ruminant which is costlier in-terms of initial capital requirement and management. The returns associated with the larger ruminants are always higher than those from the small ruminants but equally, the variable cost associated is as well higher than those of small ruminants. These possibly may be the reason for much interest of the women in the chosen enterprise of small ruminants. In most cases, men are not likely to interfere with those enterprises and hence may have little or no influence on it.

Table 1. Types of Livestock kept by women livestock farmers

Livestock Types	Frequency	Percentage	Rank
Cattle	20	10.53	4th
Sheep	20	10.53	4th
Goat	37	19.47	3rd
Swine	43	22.67	2nd
Poultry	70	36.84	1st
Total	90	100	

Source: Field Survey, 2013

Factors affecting women participation in livestock production. The study revealed that there was positive and significant relationship between women involvement in livestock production and extension contact and age. Extension contact was significant ($p<0.01$) and positive which means that the more the women have access to extension contact the more tendency for them to participate in livestock production.

This finding disagrees with that of Ayoade *et al,* (2009) [1]. who explain that access to extension contact will not increase the participation of women in livestock production.

Age is another factor influencing women Participation ($p<0.01$) that is the more the women advance in age the more they participation in livestock production. Years of experience and education were also significant although negative.

Education was significant ($p<0.01$) and negative, this indicates that the more the women are educated the less participation in livestock production this might be as a result of educated women are more interested in white-collar jobs. The result further shows that the coefficient of multiple determinations (R^2) was 0.554. This indicates that 55.4% of the variation in the women participation is accounted for by the explanatory variables included in the model.

Table 2. Socioeconomic affecting women participation in livestock production

Variables	Regression coefficient	Standard error	T -value
Constant	2.251	0.404	5.572
Age ($X_{1)}$	0.10	1.828	1.572*
Years of experience(X_2	-.063	0.30	1.828**
Education ($X_{3)}$	-.246	.132	-2.862*
Extension contact (X_4)	-150	.049	3.093***
R^2 = 0.554			

Source: Field Survey, 2013 R^2 = 0.554. *** Significant 1%. ** Significant 5%. * Significant 10%

CONCLUSIONS

Women's involvement in agricultural operations varies from location to location due to the change in social setup of every society. Participation of the women in poultry, swine and goat production raked first, second and third respectively.

The major factors affecting their participation were age, experience, education and extension contacts which were found to be significant at different levels.

There is need to identify the training needs of women participation in livestock production. Women should be linked with micro finance banks in other to have access to capital which can be used to improve their participation and expand enterprises for greater income.

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EFFECTS OF TENANCY STATUS ON THE PRODUCTIVITY OF RICE FARMERS IN BENDE LOCAL GOVERNMENT AREA OF ABIA STATE, NIGERIA

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Abstract

This study analyzed the effect of tenancy status on productivity of rice farmers in Bende Local Government Area of Abia state, Nigeria. Specifically, it identified the method of land ownership/pattern, analyzed the productivity levels of the rice farmers, examined the effects of tenancy status on the productivity of rice farmers and identified the perceived constraints faced by the rice farmers. Multi-stage sampling techniques were used in selecting 60 respondents used for the study. Data collection was by use structured questionnaire administered to the respondents and data analysis was use of such statistical tools as frequency tables, percentages, means, t-test and multiple regression analysis. The result showed that majority (71.67%) of the rice farmers in the in the study area rented land for their farming activities and that 53.33% of the respondents had a productivity range of 2.1 – 3.0, with a mean productivity of 2.2. The result showed that the productivity of owner occupier farmers were significantly higher than that of their counterparts. The significant variable influencing the productivity of the farmers were age of the farmer, farming experience, labour, capital, tenancy status, farm size, planting materials and fertilizer and agrochemicals. The major constraints faced by the rice farmers were inadequate capital, high cost of inputs, poor extension/advisory series, pest attack, and limited and high cost of land. Therefore, policies that we grant farmers increased access to land and secured tenure should be put in place.

Key words: *productivity, rice, status, tenancy.*

INTRODUCTION

Land assumable constitutes a principal factor in agricultural production all over the world and provides a basis for crop production. According to [4] land is a gift of nature which includes the soil, rivers, forest etc. Land is a fixed factor of production and remains the very basis of human existence and the foundation of our food chain. The importance of land lies in the fact that all man's activities either directly or indirectly depends on it. Hence, its availability, distribution, acquisition, utilization, affordability and sustainability determine man's degree of success in feeding his family, and maintaining his home. The extent to which this role is performed is determined in part by methods of land acquisition and arrangements for the ownership and use of land.

The land tenure system in Nigeria is based on the Land Use Decree (Act) of 1978, which is used to administer and control land use in the country [8]. The Land Use Decree of 1978 reflects the idea that it is in the public interest that the rights of all Nigerians to the land of Nigeria be asserted and preserved by law. The objectives of the Land Use Decree remain largely unfulfilled several years after its enactment, and titles to land appear to be more insecure now than ever.

Tenancy status of a farmer is another important factor affecting farmers' productivity. [6] noted that positive association exist between land ownership and productivity. Insecurity of tenure associated with leasehold or renting of land serves as disincentive to farmers from investing meaningfully on the land since the land goes back to the owner after the cropping season [14]. As noted by [17], insecure property rights over land not only reduce sharply the level of activity on the land but also lead to matching in the tenancy market along socio-economic lines and hence limit severely access to land for the rural poor.

According to [23], land tenure and property rights affect the application of technologies for agricultural and natural resource management. They noted that secured property rights give sufficient incentives to the farmers to increase their efficiencies in terms of productivity and ensure environmental sustainability. It is natural that without secured property rights farmers do not feel emotional attachment to the land they cultivate, do not invest in land development and will not use inputs efficiently.

However, [10] noted that the regulation of tenancy in the form of security of tenure may the negative effect of reducing the incentive of land owners to lease out land. [5] reported that tenancy laws reduced reduced the extent of tenancy, and the pressure of the tenancy law would have a negative effect on the land-lease market, while at the same time, the positive incentive effect on tenants might only be partially realized, such that the overall impact remains theoretically ambiguous.

Rice is one of the major staple food crop grown in Nigeria. [15, 19, and 21] observed that rice, which was once reserved for ceremonial occasions has grown in importance in recent times as a major component of Nigerian diets such that some families cannot do without rice in a day. With the increased availability of rice, it has become part of the everyday diet of many in Nigeria. According to the [9], the average Nigerian now consumes 21Kg of rice per year, representing 9 percent of total calorie intake and 23 percent of total cereal consumption. [24] reported that an estimated 2.1 million tons of rice are consumed annually. [7] noted that the most important factor contributing to the shift being consumers' preferences away from the traditional staples towards rice is rapid urbanization and associated changes in family occupational structures. They noted that as women enter the work force, the opportunity cost of their time increases and convenience foods such as rice, which can be prepared quickly, rise in importance. Similarly, as men work at greater distances from their homes in the urban settlements, more meals are consumed from the market, where the ease of rice preparation has given a distinct advantage, the trend meaning that rice is no longer a luxury food but has become a major source of caloric intake for even the urban poor.

Nigeria has not been able to meet its rice needs and has relied on rice imports. [24] noted that Nigeria is the world's second largest importer of rice, spending over US $300 million annually on rice imports alone. It stated that the country imported 1.7 million tons of rice in 2001 and 1.5 million tons in 2002 [24]. According to [15], imports of these magnitudes represent a major drain to scarce foreign exchange and a hindrance to broader developmental efforts.

Yet, Nigeria has the potential to greatly increase its own rice production. The Nigerian rice sector has a lot of potentials for increased productivity as the country is blessed with rich and abundant rice growing environments. Access to productive resources especially land is critical for attaining increased agricultural productivity. Land title can stimulate investment by means of the collateral (or credit supply) effect [3, 1, and 2]. By turning land into a mortgage able, transferable commodity, farmers can use it as collateral to access the credit needed for productivity enhancing investments. This study therefore, analyzed the effect of tenancy status on productivity of rice farmers in Bende Local Government Area of Abia state, Nigeria. Specifically, it identified the method of land ownership/pattern, analyzed the productivity levels of the rice farmers, examined the effects of tenancy status on the productivity of rice farmers and identified the perceived constraints faced by the rice farmers.

MATERIALS AND METHODS

The study was conducted in Bende Local Government Area (L.G.A) of Abia state. Bende L.G.A lies on 7^0 30^I of the Greenwich Meridian and latitude $5^0 30^I$ North of the Equator. Bende Local Government is composed of thirteen (13) communities, namely: Alayi, Bende, Ezukwu, Igbere, Item, Itumbuzo, Nkpa, Ntalakwu, Ozuitem, Ugwueke, Umu-imenyi, Umuhu-Ezechi, and Uzuakoli. The population of Of bende L.G.A. according to the 2006 population census was 192,621 persons [18]. Bende L.G.A has agric-climatic conditions typically of the tropics. Bende is bounded in the north by Cross River State, Afikpo and Ohaozara, and in the South by Arochukwu and Ohafia, while in the East and West by Ikwuano L.G.A. and Umuahia L.G.A respectively. Agriculture is widely the occupation of the people and it a major rice producing area in Abia state.

Multi-stage sampling techniques were used in selecting the respondents used for the study.in the first stage, 4 communities namely, Ozuitem, Bende, Igbere and Uzuoakoli were purposively selected based on performance in rice production in the area. The second stage also involved the purposive selection of rice farmers in each chosen community to form the respective sampling frames from which 15 rice farmers were randomly selected in the final stage, to give a sample size of 60 respondents.

Data collection was by use structured questionnaire administered to the respondents and interview schedules and relates to the 2014 cropping season. Data collected were on the socioeconomic characteristics of the rice farmers, their tenancy status, rice production input and output and their prices.

Data analysis was use of such statistical tools as frequency tables, percentages, means, t-test and multiple regression analysis following the ordinary least squares estimation technique. The productivity of the farmers is derived as:

$$TFP_i = Y_i / \sum P_i X_i \qquad (1)$$

Where: TFPi = Total factor productivity of i^{th} farmer; Y_i = Value of rice produced by the i^{th} farmer (₦); P_i = Unit price of i^{th} variable input (₦); X_i = Quantity of the i^{th} variable input used; and $\sum$ = Summation

The test for statistical difference in productivity based on tenancy status is given as:

$$\text{t-cal} = \frac{\overline{X1} - \overline{X2}}{S_{\bar{X}1} - S_{\bar{X}2}} \qquad (2)$$

$$S_{\overline{x_1}} - S_{\overline{x_2}} = \sqrt{\frac{S^2_{X1}}{n_1} + \frac{S^2_{X2}}{n_2}} \qquad (3)$$

Where:
$\overline{X}_1$ = mean productivity of owner occupied rice farmers
$\overline{X}_2$ = mean productivity of tenant rice farmers
S^2_{X1} and S^2_{X2} = variance of the mean productivity of owner occupied and tenant rice farmers respectively.
Sx_1 -Sx_2 =standard error of the difference between the mean productivity of owner occupied and tenant rice farmers respectively.
n_1 and n_2 =number of respondents of the owner occupied and tenant rice farmers respectively.

Decision rule: Reject null hypotheses if the t-computed is greater than the t-tabulated (tα/2, n-k df), implying a significant difference between the mean an productivity of owner occupied and tenant rice farmers respectively. Otherwise accept.

For the effect of tenancy status on the productivity of rice farmers, the implicit form of the model analyzed is given as:

$$Y = f(X_1,X_2,X_3,X_4,X_5,X_6,X_7,X_8X_9) \qquad (4)$$

Where: Y=TFP which is previously defined; X_1=Age; X_2= Farming experience (years); X_3 = Years of education; X_4= Labour (mandays); X_5= Capital (₦); X_6=Tenancy status (owner occupier=1, otherwise=0); X_7= Farm size cultivated (hectares); X_8= Planting materials; and X_9= Fertilizer and other agrochemicals (₦).

RESULTS AND DISCUSSIONS

Land Ownership status

The distribution of respondents based on land ownership status is presented in Table 1.

Table 1. Distribution of respondents according to land ownership status

Ownership status	**Frequency**	**Percentage**
Owned	17	28.33
Rented	43	71.67
Total	60	100

Source: Field Survey, 2015.

The result showed that majority (71.67%) of the rice farmers in the in the study area rented land for their farming activities. This discourages the farmer from making improvement on the land as he vacates it at the end of the cropping season. [14] stated that insecurity of tenure associated with leasehold or rented land serves as disincentive to farmers from investing meaningfully on the land as the land goes back to the owner after the cropping season. Therefore, efforts at enhancing rice productivity should aim at making land available to famers on secured basis and not on the one year renting period as witnessed in the area.

Productivity of the rice famers

The distribution of the respondents based on their productivity level is presented in Table 2. The total factor productivity was estimated. The result showed that 53.33% of the respondents had a productivity range 2.1 – 3.0. The mean productivity 2.2. This result suggests that opportunities exist for increasing the productivity of the farmers. This is important in order to ensure the growth and competitiveness of the agricultural market, income distribution and savings, and labour migration. An increase in productivity implies more efficient distribution of scarce resources and leads to an increase in the farmer's comparative advantage in product increases and welfare.

Table 2. Distribution of the respondent based on the productivity level

Productivity	Frequency	Percentage
0.1-1.0	3	5
1.1-2.0	18	30
2.1-3.0	32	53.33
3.1-4.0	5	8.33
4.1-3.0	2	3.33
Total	60	100
Mean	2.2	

Source: Field Survey, 2015.

Test for Differences in Productivity

The test for significant difference in productivity between the owner occupier farmers and tenant farmers is presented in Table 3.

Table 3. Test for Difference in productivity

Variable	Obs	Mean	Std. Error	Std. Dev	t- ratio
Owned	17	3.059	2342896	8116028	5.695***
Rented	43	1.962	077549	5316489	
Combined	60	2.185	0963538	7401079	
Difference		1.098	1927685		

Source: Field Survey, 2015.

The result showed that there was significant difference in productivity. The t- ratio was significant at 1% and positive implying that productivity of owner occupier farmers were significantly higher than that of their counterparts.

Determinants of Productivity of the farmers

The estimated determinant of productivity is presented in Table 4. From the Table, the Semi-log functional form was chosen as the lead equation, based on the magnitude of the coefficient of multiple determination (R^2), the number of significant variables, the conformity of the signs borne by the coefficients of the variables to *a priori* expectation, as well as the significance of the f – ratio. The coefficient of multiple determination was 0.9068. This implies that 90.68% of the variables in productivity was explained by the variables included in the model. The f-ratio was significant at 1% level of probability, indicating the goodness-of-fit of the model. The significant variable influencing the productivity of the farmers were age of the farmer, farming experience, labour, capital, tenancy status, farm size, planting materials and fertilizer and agrochemicals.

Table 4. Determinants of productivity

Variable	Linear	Exponential	Double log	Semi – log +
Intercept	6886.887 (4.95)***	9.324289 (28.60)***	7.603521 (5.96)***	49.43148 (3.90)***
Age (X_1)	-121.732 (-2.48)**	-0081532 (-1.51)	-286707 (-1.70)*	-312.5719 (-8.77)***
Farming experience (X_2)	107.339 (2.67)***	0029785 (0.55)	0953166 (0.99)	25.85414 (4.28)***
Education (X_3)	674.901 (6.42)***	0032331 (0.49)	0006663 (-0.02)	99.4821 (-1.29)
Labour (X_4)	-1814.718 (-1.76)*	-1612158 (-2.58)***	0646944 (-2.13)**	-106.2384 (-2.00)**
Capital (X_5)	8457705 (-0.22)	-0001744 (-0.74)	0232913 (0.17)	2212.185 (6.77)***
Tenancy status (X_6)	732.6881 (5.88)***	0144632 (0.19)	0050397 (3.03)***	13.31245 (6.31)***
Farm size (X_7)	5765.865 (4.51)***	2960869 (3.83)***	8236094 (6.08)***	150.2533 (5.25)***
Planting materials (X_8)	3.900257 (2.55)***	0000886 (0.96)	1477554 (1.10)	76.73344 (2.71)***
Fertilizer and agrochemical(X_9)	4364006 (0.60)	0410131 (3.65)***	1307606 (10.76)***	143.4859 (4.78)***
R^2	0.8803	0.7848	0.8973	0.9068
Adjusted R^2	0.8588	0.7461	0.8789	0.8900
F –ratio	40.88***	20.26***	48.56***	54.04***

Source: Computed from field Survey Data, 2015
*** = significant at 1%, ** = significant at 5%, * = significant at 10%, + = lead equation, (…) = t – ratio

The coefficient of age was significant at 1%

level of probability and negatively related to productivity. This implies that the productivity of the farmer decreases as the farmer gets older. Farm production is tedious requiring mental and physical exertion, hence the capacity of the farmer to cope with the daily demands and challenges of production activities declines as the farmer gets older. This explains the negative relationship between age and productivity.

The coefficient of farming experience was significant at 1% level of probability and positively related to output. This implies that the higher the years of farming experience, the higher the productivity, this conforms to a priori expectation. The years of experience may give a practical indication of the knowledge the farmer has acquired on how best to overcome certain inherent problems associated with agricultural production [12 and 16].

The coefficient of labour was significant at 5% level of significant and negatively related to productivity. This implies increased use of labour would lead to decline in output. This does not conform to *a priori* expectation. [13] and [16] however, reported similar findings. The explained that the negative relationship between labour and productivity must have resulted from increased use of labour beyond the point of its economic optimum or to the point of diminishing marginal productivity. This often happens when farm households source labour from within the household which is not paid for.

The coefficient of capital was significant at 1% level of probability and positively related to output. This implies that as capital increases productivity increases. This results from the use superior technology in farm operations such as tractors and other forms of farm mechanization in rice farming.

The coefficient of tenancy status was significant at 1% level of probability and positively related to productivity. This implies that productivity of owned farms were higher that rented farms. This confirms the result of the test of difference in productivity and collaborates the findings of [6] who noted that positive association exist between land ownership and productivity. [12] and [17] noted that insecure property rights over land reduce sharply the level of activity on the land as it serves as disincentive to farmers from investing meaningfully on the land since the land goes back to the owner after the cropping season.

The coefficients of farm size, planting materials, and fertilizer and agrochemicals were all significant at 1% level of significant and positively related to the productivity of the rice farmers. This implies that increase in these variables, *ceteris paribus,* would lead to increase in output. Large consolidated land holdings facilitates farm mechanization leading to increased output per unit of input and application of fertilizer increases the fertility of the soil, leading to higher productivity.

Constraints faced by the rice farmer

The distribution of respondents based on the problem encountered in rice production is presented in Table 5.

Table 5. Distribution of respondents based on the problem encountered

Problem encountered	Frequency*	Percentage
Inadequate capital	52	86.67
High cost of inputs	44	73.33
Lack of credit facilities	35	58.33
Pest attack	40	66.67
Poor extension/advisory services	43	71.67
Limited access/high cost of land	34	56.67

Source: Field Survey, 2015.
*Multiple responses

The Table showed that the major constraints faced by the rice farmers were inadequate capital, high cost of inputs, poor extension/advisory series, pest attack, and limited and high cost of land. These problems have been noted to be the major reasons for the slow rate of increases in rice and other food crop production in Nigeria (Palada, 1994; Onyenweaku, 2000; and Iheke, 2006). Efforts at achieving increased rice productivity therefore be aimed at resolving these myriad of constraints.

CONCLUSIONS

It could be concluded from this study that tenure security/secure property rights over land is critical to achieving increased agricultural productivity. This is given that own farms' productivity were significantly higher that of rented farm probably owing to reduction in the level of activities on rented farms. Therefore, policies that we grant farmers increased access to land and secured tenure should be put in place. This calls for a review of the land use decree with a view of making it operational especially as regards granting farmer access to land for their farm operations.

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REMITTANCE AND THE ECONOMY: THE NIGERIAN EXPERIENCE (A REVIEW)

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Abstract

Migration is a basic major component of population dynamics which is characterized by deliberate rational decision of the migrant. This phenomenon has been viewed differently by different people, with some mentioning it as a cause of degradation of rural and urban ecological resources. Some associate the spread of HIV/AIDs and recently the Ebola Virus Disease (EVD). The most positive and powerful outcome of migration is remittance income. The significant contribution of international remittances to the stability and sustainable growth prospects of developing countries cannot be overemphasized. Remittances have not only grown strongly in a positive direction, but these inflows have also exhibited a much more stability than other private capital inflows and Overseas Development Assistance (ODA). Remittances are playing an increasingly large role in the economies of many countries, contributing to economic growth and to the livelihoods of people.

Key words: *distribution, efficiency, sources, snail, technical*

INTRODUCTION

Migration and commuting are now a routine part of the livelihood strategies of the rural poor across a wide range of developing country contexts. While the usual determinants of migration such as drought are still valid and important, there are new driving forces underlying the increase in population mobility, most importantly better economic opportunities. For many developing countries, remittances (defined as the portions of cross-border earnings that migrants send home) from overseas migrants exceed development aid and foreign direct investment volumes. Moreover, remittances from migrant relatives, either internal or international, are often the main component of rural households' incomes. Unlike aid, remittances flow directly to individual households and unlike loans they incur no debt. Besides contributing to household livelihoods, remittances can foster longer-term development through investment in education, land and small businesses. In some places, migrants' associations channel part of the remittance inflows into community development projects, such as schools, health centres and wells.

On the significance of remittances, it was believed by many scholars for a long time that remittances form an insubstantial part of village income. However, recent evidence suggests otherwise and it has grown in importance as a component of households' income. Remittance has been described by many as the newest "development mantra" because of its surge.

MATERIALS AND METHODS

The study area was Nigeria. Nigeria, the most populous country in Africa, is situated on the Gulf of Guinea in West Africa. Nigeria is bordered to the north by Niger, to the east by Chad and Cameroon, to the south by the Gulf of Guinea of the Atlantic Ocean, and to the west by Benin. The lower course of the Niger River flows south through the western part of the country into the Gulf of Guinea. Swamps and mangrove forests border the southern coast; inland are hardwood forests.

It covers a land area of 356,667 square miles (923,768 square kilometers). According to the 2006 National Census, Nigeria has a population of 140,431,790 persons [22] and based on the 2015 estimate, the country has a population of 182,202,000 persons. It has a population density of 489.3/sq mi (188.9/km^2).

Nigeria is classified as a mixed economy emerging market, and has already reached lower middle income status according to the World Bank, with its abundant supply of natural resources, well-developed financial, legal, communications, transport sectors and stock exchange (the Nigerian Stock Exchange), which is the second largest in Africa. As of 2010, about 30% of Nigerians are employed in agriculture [21]. Agriculture used to be the principal foreign exchange earner of Nigeria. Nigeria has a sizeable proportion of its population in the diaspora and remittances has formed a substantial portion of income of most Nigerian families.

A variety of sources were used to compile the studies used in this review which include: personal communication with the authors, economic database such as Web of Science, Google Scholar, AgEcons search and ASC index, previous bibliography, ajol.info, and other online database using relevant keywords. This was followed by an exhaustive search within references lists of relevant papers, which were subsequently reviewed.

RESULTS AND DISCUSSIONS

Remittance and the rural agro-economy

In Nigeria, 70 percent of the populations live in the rural sector where farming is their primary occupation [22, 25]. Incomes from the farms are much lower than expected to maintain the minimum standard of living essentially arising from low productivity [23, 10], and most of the farmers and other rural dwellers can hardly feed themselves. The consequence is pervasive poverty among the populace. The national poverty incidence was 54.4 percent, whereas in the rural and urban sector, it was 63.3 and 43.2 percent respectively [20]. Hence, the reference that poverty is predominantly a rural phenomenon.

[3] stated that 4000 Nigerians own 96 percent of the wealth in Nigeria; and explains the irony that Nigeria is the sixth largest exporter of crude oil and at the same time hosts the third largest number of poor people in the World after China and India [18, 9]. These translate to low standard of living or lowered welfare, with Nigeria being among the 20 countries in the world with the widest gap between the rich and the poor [9].

A prominent response from households is out migration of members in the hope that when the migrant members settle down, they would become sources of remittances to fill up shortfalls in household finances in a way that could enable them enjoy improvements in their overall wellbeing. According to [5], migrant remittances have made possible a drastic improvement in the living conditions of millions of households in migrant-sending countries. It has enabled such households to improve or maintain their livelihoods by stimulating and feeding into local productive activities. Analyzing the potential of migration strategies in stabilizing the income of rural households, [28] reported that these strategies are actually used as a substitute for missing financial and insurance markets, especially in cases in which the migrant remains an economic part of the household and the region of origin.

[8] noted that Nigeria is the largest recipient of remittances in Sub-Saharan Africa. They reported that the country receives nearly 65 percent of officially recorded remittance flows to the region and 2 percent of global flows. The Central Bank of Nigeria (CBN) reported approximately US$2.26 billion in remittances for 2004. The phenomenon of Nigerian emigrants, considered as an escape from hardship on the home front and a depletion of human capital is somehow paying off for the country. This is in view of the revelation that Nigerians abroad grew the economy by a whopping $7billion in the year 2008 and that Nigeria is the sixth highest destination of remittances from its citizens living in the Diaspora [35, 31]. It noted that recorded remittances from about 20 million Nigerians in the Diasporas exceeded $7 billion in 2008 and that Africa accounts for up to $46 billion of the globally recorded remittances. In 2012, Nigeria and five other countries were named by the World Bank as top recipients of global remittances with Nigeria's officially recorded

remittances for 2012 being $21 billion. As is the case for other countries in the Region, the figure might not be reflective of the actual contributions of these Nigerians since it could be higher as underreporting of remittance flows to Nigeria is common because of data collection deficiencies and the prevalence of informal transfer mechanisms which account for 50 percent of total flows to the country.

On the household level, research evidence from Nigeria [10, 24, 12] show that migrant remittance had significant impact on farm output and in the welfare of the households. On the impact of remittances on output of smallholder arable crop farmers in South Eastern Nigeria, [12] reported that remittance receiving farm households produced significantly higher output than the non-receiving households. Statistical tests for structural shift in production function and differences in output revealed that significant difference exist between the production functions of the remittance receiving and non-remittance receiving farm households and output advantage for the remittance receiving households derivable from the use of remittance income. Similar result on welfare was obtained by [24]. The remittance receiving rural farm households had superior output advantage and welfare advantage relative to the non-remittance receiving households. This was made possible by use of superior technology and inputs by the remittance receiving households which remittance income enabled them to acquire unlike their counterpart. As noted by [31] remittances also help to alleviate capital constraints and provide security in risky agricultural sectors where credit and insurance markets are not developed; as in Nigeria's rural agro-economy. Migrants have also contributed immensely in the development of their home communities by undertaking directly development projects such as the award of scholarship to students, provision of free Medicare, building of schools, health centres, town unions, rural electrification projects, and road construction. This they do by uniting themselves and forming an umbrella association that unite them with the home unions.

Globally, remittances now constitute the largest source of financial flows to developing countries after foreign direct investments [13]. In some countries, they are the largest source of foreign capital. For an increasing number of developing countries, remittances form a crucial source of foreign exchange, sustaining their balance of payments. Recognized as an important driver of the economy of most developing countries, international remittances play vital roles in poverty reduction, income redistribution and economic development, especially in rural areas.

[11] noted that remittance has become an important source of revenue both for government through tax and fees and for households. At household level, it helps increase income and consumption smoothing, increase saving and asset accumulation, and improve access to health services, better nutrition and education [16, 14, 15, 36]. Likewise, at village/community level, remittance income can help stimulate local commodity markets and local employment opportunities. Remittances have proved to be less volatile, less procyclical, and therefore a more reliable source of income (for agricultural production and other household uses) than other capital flows to developing countries, such as foreign direct investment (FDI) and development aid [7, 17, 26, 27].

Remittances and the national economy

Remittances reflect the local labour working in the global economy and have been shown to explain partly the connection between growth and integration with the world economy [1]. Remittances enhance the integration of countries into the global economy and reflect the local labour working in the globalized economy. The significant contribution of international remittances to the stability and sustainable growth prospects of developing countries cannot be overemphasized. Remittances have not only grown strongly in a positive direction, but these inflows have also exhibited a much more stability than other private capital inflows and Overseas Development Assistance (ODA). [2] noted that while Foreign Direct Investment (FDI) and capital flows declined sharply in recent years due to the economic recession in most industrialized countries, workers' remittances continued to increase, reaching US$113.4 billion in 2002, US$142.1 billion in 2003, US$160.4 billion in 2004 and US$167 billion in 2005. These figures clearly suggest that, in recent years, remittances have by far exceeded the volume of ODA. Even in some developing countries today, remittance inflows exceed FDI or export earnings. Between 1995 and 2003, whereas migrant remittances to developing countries grew from US$58 billion to US$160 billion, FDI grow from US$107 billion to just US$166 billion, with ODA increasing from US$59 billion to a mere US$79 billion. It is reported that in some economies such as Egypt, Gambia, Lesotho, Morocco and Swaziland, migrant remittance inflows alone contribute to more than 5% of gross national income over the past five years.

International financial flows of remittances, official development assistance and foreign direct investment for the year 2007 is shown in and flow of remittances to Nigeria from 1980-2008 is shown in Table 1 and Figure 1 respectively.

Table 1. International financial flows: remittances, official development assistance and foreign direct investment (2007)

Country	Remittance inflows (US$ millions)	Remittance inflows per capita (US$)	Remittance inflows as a % of ODA	Remittance inflows as a % of GDP	Ratio of remittance inflows to FDI
Nigeria	9,221	62	451.5	6.7	1.5
Ghana	117	5	10.2	0.8	0.1
Burkina Faso	50	3	5.4	0.7	0.1
Mali	212	17	20.8	3.3	0.6
Côte d'Ivoire	179	9	108.7	0.9	0.4
Cameroon	167	9	8.7	0.8	0.4
Gambia	47	28	65.4	6.9	0.7
Morocco	6,730	216	617.8	9.0	2.4

Source: World Bank (2009) "Migration and Remittances Factbook 2008: March 2009 Update". Washington DC: World Bank

A striking revelation besides the positive growing trend in global remittance flows to developing countries, which according to the [35], migrant remittance in flows alone reached an all-time high of US$282,793 million in 2008, is the steady manner of reacting to volatile and unexpected economic events.

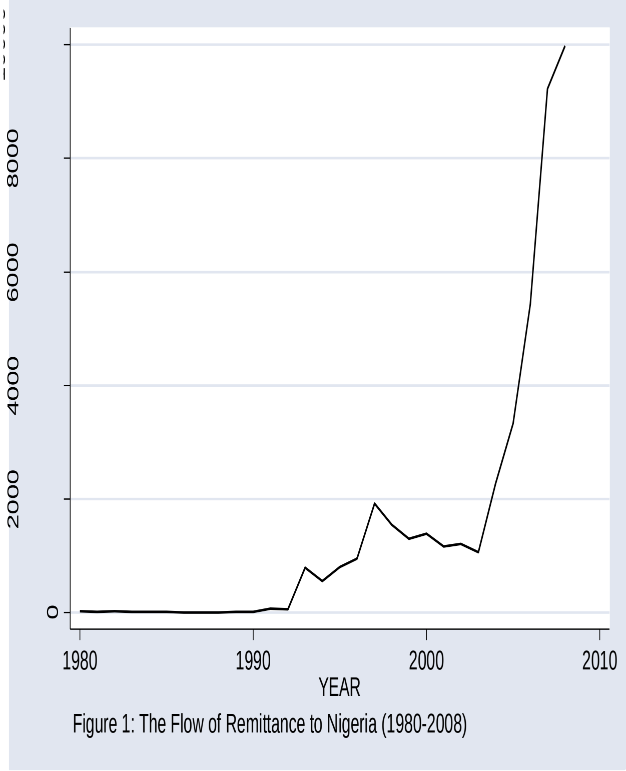

Fig.1.The flow remittance to Nigeria
Source: [11]

For example, in the wake of the Asian financial crises between 1998 and 2001, when private capital flows declined significantly, remittances to developing countries have continued to rise. It is believed that the consistent positive trend in the flow of remittances can be attributed to some unique features that distinguish remittances from FDI and ODA. The peculiarity of remittance flows is that they are from private sources driven by altruistic and solidarity motives that are expected to remain less volatile than other private official flows and counter-cyclical to smoothen consumption pattern over the business cycle. One importance of migrant remittance inflows is that it is directed at productive activities [4, 14].

On the effect of remittances on the Nigerian economy, [11] reported that remittance inflow has been on the increase over the past two decades. Also, remittances, per capita income, investment and time were the positive and significant factors influencing output of the economy while consumer price index significantly influenced output negatively.

Remittance was significant at 1 percent and positively related to the economy's output. This implies that the national output increases with increase in the inflow of remittances to the country. This result lay credence to the view upheld by contemporary development economists that international remittance inflows are one of the major macroeconomic factors that significantly promote long-run economic growth in small-open developing economies [2]. Also this result conforms to the findings of [28]. Other empirical evidence show that remittances positively impact on household investments in remittance-receiving developing countries, raise the consumption capacity of rural households which might have substantial multiplier effects because they are more likely to be spent on domestically produced goods, and impact positively on the balance of payments in many developing countries as well as enhance economic growth, via their direct implications for savings and investment in human and physical capital and, indirect effects through consumption [27, 19, 37, 34, 35]. Thus, at the micro level remittance is used for education, medical and health expenses, basic expenses and needs, building or improving housing, buying livestock or land, purchasing consumer durables such as appliances and stereo television, loan repayments, savings, employment or income generating activities and investing in the socio-cultural life.

[6] in the work on "worker's remittances and economic growth :evidences from Nigeria" reported that capital accumulation is sensitive to its previous stock and domestic cost of production that is proxied by the domestic interest rates and the exchange rate of the local currency. It is also sensitive to the national efficiency parameter, which is in part influenced by the external capital and technology. Labour supply and human capital are also sensitive to capital import, in this case remittances inflow. They noted that the application of domestic technology depends on the quality and the stock of other factors of production. They concluded that if remittance impact positively on other factors of production, the fact would remain that overall economic growth will also be positive.

On channels by which remittances impact on economic performance in Nigeria, [32] reported that remittances affect economic performance in Nigeria through its interaction with human capital and technology diffusion. He also noted that government capital expenditure on economic and social services is equally important in accelerating the pace of economic growth and development.

Using a time series data, from 1970-2010 in an error correction methodology (ECM), [32] found out that the long-run static model indicates that workers' remittances is significant and has positive impacts on economic growth. Furthermore, the short-run dynamic model revealed that the lagged value of workers' remittances is significant and impacts positively on economic growth. The coefficient of the error correction term (ECT) in the short-run dynamic model is statistically significant and appropriately signed. Consequently, the paper recommends the need to provide adequate infrastructure for attracting more remittances into the economy through formal financial sector channel as well as measures encouraging the recipients to channel such into productive sector or through domestic savings that would boost investment and economic growth, rather than enmeshed in non-productive activities.

[1] noted that remittances is positively and significantly viable in its contribution to economic growth (proxy by gross domestic product) in some Sub-Saharan African countries and reduced poverty to some extent.

CONCLUSIONS

International remittance inflows are one of the major macroeconomic factors that significantly promote economic growth in a developing economy like Nigeria. Therefore, remittance receiving countries need to provide a friendly economic environment through sound macro-economic policies, including stable exchange rates, basic physical infrastructure, improved market integration, reliable financial and other institutions, transparent legal system and good governance – in essence, conditions that can prime the economy for development and equip it adequately to benefit from this external stimuli. This is particularly important if remittances are to be attracted and used as development capital. The corporate sector, especially banks and other financial institutions, can do a lot to increase the volume and value of official flows by reducing the transaction cost, simplifying transfer procedures and by encouraging through various other means the use of formal financial channels.

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WEEK-END TOURISM IN RURAL ZONES – THE NEW TOURIST REALITY

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Abstract

In today's fast-paced and stressful lifestyle, short-term forms of tourism become increasingly preferred. Another factor that favors short-term trips (given the conditions in Bulgaria) are the financial constraints on households and the lack of enough free time. This is precisely the basis for the rapid development of weekend tourism in Bulgaria and its high level of participation. On the other hand, Bulgarian traditions and folklore, traditional cuisine, architectural features of certain regions, the nature, spontaneous contact with nature, high degree of diversity and other factors can be considered as unique tourist resources for the development of rural tourism in the country. What is more, these resources if used as an integral part of rural tourism product, can make it extremely attractive and sought-after by both Bulgarian and foreign tourists. Therefore, it can be argued that weekend tourism in rural areas is one (or should be one) of the new tourism realities of destination Bulgaria, which is also in the context of the main purpose of this research.

Key words**:** *rural area, rural development, rural tourism, rural zone, tourist area, weekend tourism*

INTRODUCTION

There are different definitions of rural tourism based on different criteria and approaches. There is no single, generally accepted, definition for it, but the existing ones can help us bring out some of its basic elements that characterize it: holiday in a rural area; traditions and folklore; traditional dishes; rural lifestyle; contact with nature and people; humanism; agriculture; divergence; "host-guest" connection, etc.

Therefore, tourism services in the rural areas are able to support local population and communities in developing economic diversity [10].

Hence, its main feature is that it takes place in the conditions of rural environment. Very often the interpretation of the terms "rural area" and "countryside" matches. The latter is initially associated mainly with the demographic characteristic of the area. "Rural environment" is defined as "a location with less than 2,000 inhabitants who live in houses not more than 200 meters apart from one another" [12].

Here the meaning is more thorough. Rural environment is the meaningful and spiritual side of rural life, of rural population. It is part of the natural and anthropogenic resources associated with the development of rural tourism. It is the people and their skills, initiatives and opportunities that constitute the greatest asset in every rural area [8]. Therefore, if rural area includes the geographical, demographic and economic characteristics, livelihood of local population, infrastructure and social security of the village, etc., rural environment embodies everything else – the lifestyle, rural identities, rural culture, their living standards and customs, rural humanism, nature, the attitude towards people and environment.

According to Bulgarian legislation, however, rural areas are "municipalities on whose territory there is no city with a population of over 30,000 people and the population density is below 150 persons/km^2" [11].

In some rural municipalities agricultural activities are poorly covered and the population has a typical urban lifestyle. Some typical rural areas does not "fit" in the definitions of rural area and some smaller cities may have the characteristics of villages in terms of their lifestyle. That is why, according to Atanasova-Chopeva, "rural area should be considered such an area that comprises all villages within a municipality, i.e. the rural part of each municipality should be regarded as a separate distinct rural area" [2].

It is precisely this definition that is regarded as the essence of rural zone – a territory which has the typical characteristics of rural environment with regard to the way of living. An advantage for the development of tourism in such rural areas is the fact that they are near major cities and are already recognizable as tourist destinations.

On the other hand, weekend tourism can be regarded as a trip and/or stay in a selected tourist site (destination) during free weekends. According to prof. Muller, we can determine 10 tendencies that define tourism [5]. Among them the following ones directly affect weekend tourism in rural and suburban areas:

*(i)**tendency towards experiment***, towards experience — people seek to experience something different, the so-called: "calculated risk" – in this case, the vacation in suburban, but primarily rural areas, is in itself an experience of something different;

*(ii)**tendency towards "convenient" environment*** – people prefer destinations that offer coziness and comfort of residence – the environment in rural zone offers more humanism while the innate qualities of the hosts as well as the presence of natural elements (this applies also to suburban areas), to a certain extent, provide the comfort of residence. As regards the comfort – it is one of the statutory conditions for the development of tourism at all;

*(iii)**tendency towards cheap trips*** - search for advantageous deals - in comparison to the offers of large and well-known hotel chains weekend tourism in suburban and rural areas offers prices that are substantially lower;

*(iv)**tendency towards more frequent and short-term trips.***

Its combination with rural tourism, i.e. its positioning in rural areas, leads to the creation of unique rural tourism service that satisfies the new needs – divergence, adventure, nearness to town, nature, humanism, delicious dishes, relatively low cost. Another advantage is the close relation between weekend tourism in rural areas and the weekly leisure-time fund.

MATERIALS AND METHODS

At the core of this research is the thesis that weekend tourism in rural areas is one of the new tourism realities of destination Bulgaria. For this purpose the methods of analysis and deduction are used as well as survey method, case study and others.

The aim is to bring out the importance of weekend trips as part of the tourist habits of population, as well as the degree of promotion of rural areas as tourist destinations.

It is clear that the popularization of contemporary tourism causes significant problems of economic, social, cultural and environmental nature [6]. Having in mind globalization and its effects on tourism, there is an urge for complete change in the product policy of tourism [4].

That is why one of the objectives of this research is for weekend tourism in rural areas to be perceived as an integral part of the model for achieving sustainable tourism in Bulgaria. The latter is not a type of tourism, but a form of tourism development [9]. Sustainable tourism aims not only at influencing tourists during their trip, but also at forming a culture of resource conservation in tourist centers [7]. That could be perceived as the added value of weekend tourism in rural areas [1]

RESULTS AND DISCUSSIONS

The meaning of vacation is a phenomenon of medical and social competence. The role of economic science is to create the organizational, managerial and economic preconditions for their realization in life and daily life. Medically justified vacation has found its economic interpretation as part of the vacation, tourism and leisure in general.

Weekend tourism in rural areas refers to the weekly leisure-time fund; therefore, it is a form of utilization of weekly rest period. To emphasize its importance, it is necessary to examine the level of satisfaction of working people from their weekly rest period. Below there are shown the results of questionnaire survey conducted by the author in the territory of the city of Plovdiv, comprising 425 respondents.

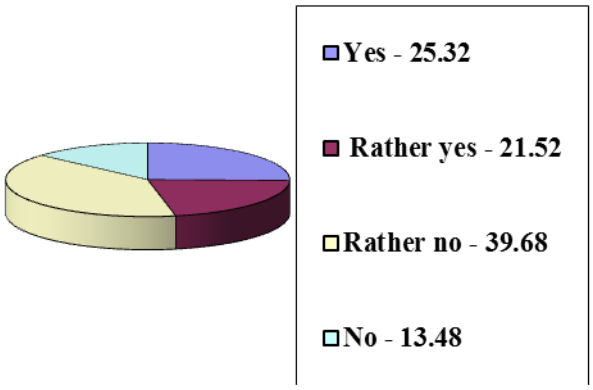

Fig. 1. Answer to the question: "Do you feel refreshed after your weekly rest period", in %
Source: Field survey, 2015

The Fig. 1 clearly shows that for the majority of the respondents (53.16%) weekly rest period is insufficient to compensate for the physical and mental fatigue accumulated during the working week.

The next question – "How do you spend your weekly rest period?" - is used for a more precise understanding of the meaning of weekend tourism as a factor in maintaining the natural balance "Activity – Relaxation". For greater clarity, the respondents were divided into two main groups – those who answered positively to the previous question and, respectively, those who gave a negative response. The results are presented in Fig.2.

The Fig.2 shows that the majority of respondents provide the necessary conditions for their physical and psychological recovery during the weekly rest period. Slightly more than 54% practice weekend tourism, while almost 75% of them are directed precisely to rural areas. By including those who spend their vacation in the countryside, it turns out that the majority of people who are happy with their weekly rest periods are associated with the village and rural way of life, respectively, with weekend tourism in rural areas.

In respect of specific activities and sought-after tourist services – a huge variety is provided. The concentration is around activities that offer a high degree of diversity from everyday life. These are the preferable elements of weekend tourism in rural areas (Table 1).

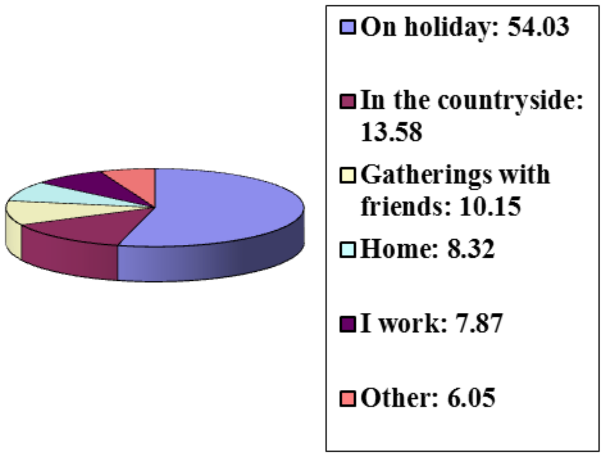

Fig. 2. Activities carried out during the weekly rest periods by the Group of people happy with their weekly rest periods, in%.
Source: Field survey, 2015

As it is apparent from Table 1, the preferences are towards mountainous areas and more seldom towards presence of water areas. It has its logical explanation – for the living conditions in Bulgaria beach resorts are distant from the capital and most of the major regional cities, which suggests seeking other forms of weekend holiday. On the other hand, the presence of lakes, reservoirs, rivers, etc. predisposes to fishing tourism although this service is still underdeveloped in our country. This fact makes the villages in mountainous and hilly areas in the country most preferable.

Interesting results are obtained in terms of destinations as well.

As mentioned above, the majority of respondents preferred vacations in rural environment which could offer them contact with nature, divergence and humanism.

With respect to the distance from people's place of residence – the preferences were towards more nearby destinations: around 80% of the respondents would take a trip within a maximum of 2 hours and 30 minutes distance (or up to 200 km)[1].

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[1] Concentration of tourist facilities in certain areas is typical for the Bulgarian conditions (especially in mountainous areas), most of these facilities are within 2-hour trip by car from the major centers. This being the reason why these destinations at such distances are so preferred.

Table 1. Elements of weekend tourism product in rural areas and their importance for its users, in %

No.	Elements	Does not matter	Slightly importa nt	Import ant	Very Importa nt	Total
1.	Stay in the mountains	2..53	11.39	33.54	52.54	100.00
2.	Presence of water areas (river, lake, sea, etc.)	12.03	18.99	42.41	26.57	100.00
3.	Rural identity (lifestyle, culture, way of living)	10.99	18.91	37.97	32.13	100.00
4.	Relaxing environment, escape from everyday life	0.03	5.06	32.91	61.40	100.00
5.	Making new friends	12.66	30.38	39.24	17.72	100.00
6.	Tranquility and solitude	2.53	22.15	34.18	41.14	100.00
7.	Presence of places of amusement	24.68	32.91	27.85	14.56	100.00
8.	Nearness to town	18.10	17.09	37.15	27.66	100.00
9.	A break from physical exertion	12.66	20.25	32.91	34.18	100.00
10.	A break from neuropsychic exertion	2.53	7.59	20.05	69.83	100.00

Source: Field survey, 2015

As it is seen from table 1 - about 65% of the respondents in the survey - the nearness to town/city is of great significance.

As indicated in table 1, tourist destination should provide opportunities for exploring rural culture and lifestyle (an important element for 37.97% and very important element for 32.13%); divergence (important for 32.91% and very important for 61.40%); it should offer the necessary degree of tranquility (34.18% - important and 41.14% - very important). By providing these requirements, prerequisites are created for overcoming physical and mental fatigue – important respectively for 32.91 and 20.05%, very important for 34.18% and 69.83% of the respondents who are happy with their weekly rest period.

Particular areas of interest are the last two categories of people who are content with their weekly rest – who answered "I work" and "other" (Fig. 2), because they are almost 14% of this group of respondents. In terms of working people, only 8.06% are directly involved in agricultural activities, which is normal, given the level of agricultural tourism in Bulgaria which is yet weakly developed. As a main motive for such form of utilization of weekly rest period, almost 90% indicate the diversification of their usual work activities, since with most of them the workload during working hours is chiefly mental. Work activities during vacation are geared primarily to satisfying certain hobby interests, such as pottery, woodcarving, hairdressing, cooking, etc.

What they have in common is that these activities can be offered as part of rural tourism product, respectively – as elements of weekend tourism product in rural areas.

This is not the case, however, with those who are not content with their weekly rest. A great number of them are forced to work a second job during the weekends, prompted by the shortage of funds, which corresponds with the lack of enough free time[2]. For this reason some of them are forced to stay in their homes, or to travel to their home villages, in order to provide food products.

A small part of respondents spend their

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[2] Often, in an informal conversation, respondents revealed that lack of enough free time was "the more serious" problem, but the lack of sufficient financial resources was the initial reason for the additional employment during weekends. More disturbing is the fact that even when they reach a certain standard of living, to a large extent people have become accustomed to this type of overloading and prefer spending their weekends in the way they have done so far. This is probably due to the long transition in Bulgaria which has largely disturbed the travel habits of the population. On the other hand, in terms of younger people, such habits are entirely missing or severely limited – within the framework of the annual holiday.

weekly rest traveling for relaxation, but often due to the limited family budget they are not able to provide the conditions necessary for that purpose. In general, the trips are to their private villas and the major part of the weekend time is occupied with work – repairs of buildings, preparing for the winter; work activities related to maintaining the improvised family farms and other alike that largely resemble the usual domestic pursuits. The only benefit is in changing the place, i.e. the situation of residence – from home (city) to the villa (the village).

The results are illustrated in Fig. 3.

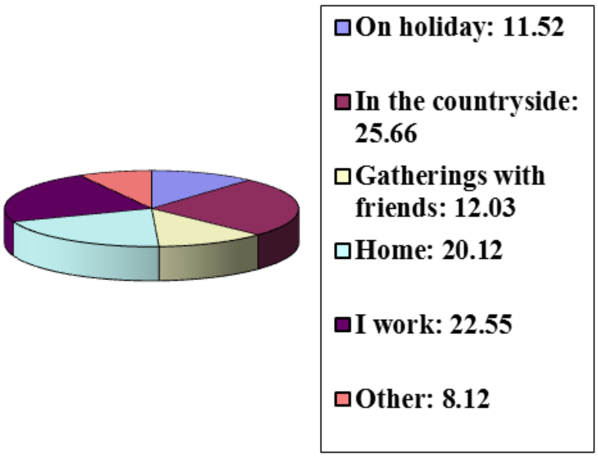

Fig. 3. Activities carried out during the weekly rest periods by the Group of people unhappy with their weekly rest periods, in%.
Source: Field survey, 2015

Nevertheless, about 30% of the respondents (unhappy with their weekly rest) would like to change the way they use it by practicing weekend tourism. The percentage is high enough to be of interest for further research, which is the motive for exploring their expectations towards the weekend tourism product and its spatial positioning. This is illustrated in Fig. 4 – preferences of those who are unhappy with their weekly rest in relation to the selected destination.

Here, again, it is apparent that the preferences are to closer destinations, and as more than one-third are directed, once again, to rural areas.

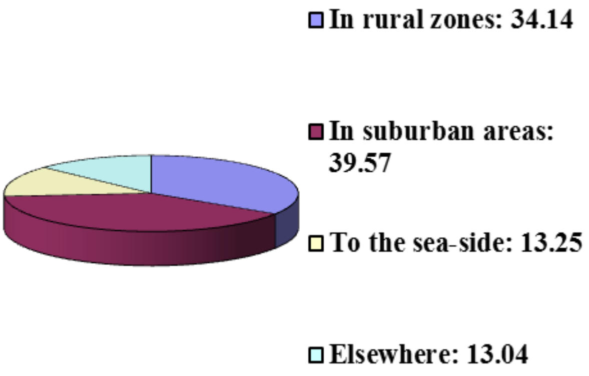

Fig. 4. Answer to the question "Where would you prefer to travel during your free weekends?", in %.
Source: Field survey, 2015

Again the most sought-after elements of weekend tourism in rural area, as it is illustrated in table 2, were connected to opportunities for exploring rural culture and lifestyle (72.33% of the respondents indicate it to be the main motive for future trips), contact with nature (85.01%), peace and quiet (73.14%), divergence and escape from everyday life (91.10%), conditions for physical and mental rest – respectively 68.62% and 73.28%.

The implication is that for both real users and potential users of weekend tourism product in rural areas certain elements of its product have the highest degree of significance for tourists and can be considered as **factors of satisfaction from the weekly rest.**

It is obvious that to a large extent the results repeat themselves, which proves the importance of weekend tourism as a form of utilizing the weekly rest period, in particular - weekend tourism in rural areas.

The importance of the latter will continue to grow due to the specifics of destination Bulgaria and the economic situation in the country on the one hand and, on the other hand, due to the approach adopted for the tourist zoning of Bulgaria.

It provides for the establishment of 9 tourist regions, each of them shall have two sub-regions with the relevant main and additional specialization in tourism [3].

Table 2. Elements of weekend tourism product in rural areas and their importance for its potential users, in %.

No.	Elements	Does not matter	Slightly important	Important	Very Important	Total
1.	Stay in the mountains	2.98	12.01	41.93	43.08	100.00
2.	Presence of water areas (river, lake, sea, etc.)	15.13	21.05	39.66	24.16	100.00
3.	Rural identity (lifestyle, culture, way of living)	20.26	7.41	29.77	42.56	100.00
4.	Relaxing environment, escape from everyday life	4.78	4.12	26.88	64.22	100.00
5.	Making new friends	27.56	31.09	25.16	16.19	100.00
6.	Tranquility and solitude	2.82	24.04	40.65	32.49	100.00
7.	Presence of places of amusement	29.15	17.56	32.51	20.78	100.00
8.	Nearness to town	19.66	21.13	39.66	19.55	100.00
9.	A break from physical exertion	9.07	22.31	33.15	35.47	100.00
10.	A break from neuropsychic exertion	1.23	25.49	22.53	50.75	100.00

In this situation forming rural areas for recreation and tourism will play an extremely important role for the development of rural areas in Bulgaria and in particular - for the development of tourism in them. The presumption is that a large part of the villages with opportunities for development of rural tourism (or with already developed one) fall in tourist regions, where rural tourism is not included even in the additional specialization of the region. Thus, prerequisites are created for non-use of the existing tourism potential or "destruction" of already established product.

The tendency towards increasing the number of holidays at the expense of their duration, including the development of weekend tourism which is characteristic for contemporary tourists, especially for rural tourism, turns the creation of rural areas into a key instrument for the development of sustainable forms of tourism in Bulgaria.

Therefore, it can be argued that the weekend tourism in rural areas can and should be one of the new realities of the Bulgarian tourist product, beyond, of course, well-developed sea, mountain (winter) and spa tourism in Bulgaria.

CONCLUSIONS

Based on the results presented in this research, the following basic conclusions may be drawn which give some general directions to the research performed. The conclusions are not final, but they could be considered as a solid base for the future development of tourism in Bulgaria, especially of rural tourism, after the tourist zoning of the country.

Bulgaria is traditionally known as a destination for sea, balneological (SPA) and mountain tourism.

The country enjoys highly favourable climatic conditions, including natural and anthropogenic resources for development of rural and other specialized types of tourism.

Rural tourism is practiced increasingly in the form of weekend trips.

The accepted approach to tourist zoning of the country would give rise to a number of changes in the development of tourism in Bulgaria, especially for some of its specialized forms like rural tourism.

In response to the new conditions, a result of the tourist zoning, key changes should be made in the organization of rural tourism.

It is necessary to establish rural areas for recreation and tourism and they should have the status of micro-regions, so as to maximally utilize the available conditions for the development of rural tourism, or keeping the areas which have already developed such as:

(i)the solution offered (conclusion 4) follows its logic based on consumers' attitudes regarding the consumption of rural tourism product – over 75% of those who travel during their weekly rest (resp. over 60% of those who wish to travel) are directed precisely to rural tourism;

(ii)given the formation of tourist regions in Bulgaria with their respective centers and the tendency towards practicing rural tourism during weekends, the establishment of rural areas would be economically justified as well;

(iii)to establish itself as a destination a rural area must meet consumers' expectations – it should offer opportunities for exploring rural culture and lifestyle; natural factors, quietness, tranquility and humanism must be abundant;

(iv)in view of the rich cultural heritage of Bulgaria, its ethnographic peculiarities, the peculiarities of its social assets and current trends in tourism, it can be argued that one of the new tourism realities of destination Bulgaria can, and should be, weekend tourism in rural areas.

It is exactly this type of tourism that can be seen as an instrument to partially overcome the demographic and financial-economic crisis in Bulgarian villages.

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SOME ASPECTS RELATED TO BARLEY COMMERCIAL OPERATIONS WORLDWIDE (2011 - 2013)

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Abstract

Barley is one of the cereals grown in Romania, along with corn, wheat, rye. Barley is grown in a small area (701.5 thousand ha - average for the period 2009-2011), and it is characterized by a total production of 43,128.2 tons and an average production of 6,148 kg/ha. The presentation of food balance is considered interesting in terms of supply and demand components: production, imports, stocks, exports, respectively seed material, food, industrial raw materials, other uses, losses. Based on the volume of total supply and demand, it could determine the balance of that product nationally.

Key words: *barley, export, import, surplus, trade balance deficit*

INTRODUCTION

Barley is one of the most important crop plants that belongs to the group cereal, multi-use in human food, animal feed or brewing industry [3]. Currently, barley is used less in the feed people, and is grown especially for the many uses which it receives, animal feed and industry [6]. Barley and two row barley, have fodder importance, industrial and technological agrotechnics [2]. Influence factors of profitability and economic efficiency in barley are the average yield per hectare, administration and trading costs [5]. Consequence of this, commercial exchanges conducted on the international market may increase financial performance achieved by producers.

Conducting international commercial exchanges is accomplished at the reference markets, characterized by a series of specific phenomena. Therefore, the result of perfect competition is to establish the equilibrium price which ensures the balance of interests of producers and consumers. He acts as a kind of "magnet" economic in price formation [8]. Factors influencing the international prices are more numerous and complex than those of the internal environment. They can be grouped into trie categories: internal factors of the company (the company's strategy, cost of production, firm character, nature of the product); market specific factors (demand, competition) and environmental factors (customs tariffs, non-commercial barriers, government regulations, exchange rate fluctuation, free zones, dumping, transfer pricing, price quotations [7].

Barley falls into the grain market to distinguish from other subsystems of marketing, primarily through dynamic between supply and demand report [1].

MATERIALS AND METHODS

Carrying out the work involved documenting, through the use of statistical reporting data [10].

The system of indicators specific to international trade (recommended and used by FAO) include: imports, exports (including food aid) - issues presented both in natural units (thousand t, t) and the value units (thousands $). Based on the expression value of imports and exports, trade balance is constructed as the difference between exports and imports.

The indicators are presented in the five continents - Africa, Americas (which includes South America, North America, Central America, Caribbean), Asia, Europe and Oceania (Australia, Micronesia, New Zealand, Polynesia), but also at general global and European Union and Romania (2011-2013). It should be noted that, for the European Union common market organization extends to grain cereals (wheat, barley, rye, corn, oats, sorghum, etc.) and products resulting from the first processing (flour, pearl barley, semolina, starch, cereal-based products) [9].

The paper used indices analysis, comparison over time being highlighted through the mobile base index, calculated by formula:

$I_{bm} = \frac{Y_n}{Y_{n-1}} x100$, in which: Y_n - the level of indicator for each component of the dynamic series; Y_{n-1} - the level of temporal sequence indicator considered as a basis for comparison or reference period [4]. Simultaneously paper used structural indices.

RESULTS AND DISCUSSIONS

Table 1 presents the evolution and structure of imports worldwide.

In case of 2011, it was found worldwide, a total imported quantity of 24,573,270 tons, whose continental contribution was the following one: 12,585,576 tons Asia (51.22%), 9,525,839 tons Europe (38.76%), 1,238,354 tons Africa (5.04%), 1,209,827 tons Americas (4.92%) and 13,674 tons Oceania (0.06%).

The European Union achieved 9,086,298 tons barley imports, representing 36.98% of the global indicator level. Romania has made imports of 186,770 t, which represented 0.76% from the world indicator.

For 2012, it is found in each continent, the existence of various amounts for imports of barley: 12,837 tons Oceania, 1,375,281 tons Americas, 1,615,330 tons Africa, 8,142,209 tons Europe and 16,521,591 tons Asia, which led to a worldwide indicator of 27,667,248 tons. Following these amounts, the indicator structure was as follows: 0.05%, 4.97%, 5.83%, 29.43% and 59.72% for Oceania, Americas, Africa, Europe and Asia. Regarding the European Union anchoring worldwide it can be seen a share of 26.77%, while imported a quantity of 7,406,651 tons. Analyzing Romania's position in the global context, it has a share of 0.50%, with an imported quantity of 138,024 tons.

At the level of 2013, there were total imports of 30,168,167 tons, to which each continent had a variable contribution as follows: Asia – 60.17% (18,151,656 tons), Europe – 26.76% (8,074,093 tons), Africa – 7.72% (2,328,194 tons), Americas – 5.30% (1,599,617 tons), Oceania – 0.05% (14,607 tons).

The imports of the European Union reached 7,753,432 tons, representing 25.70% of the world indicator. For temporal sequence respective Romania imported 222,758 tons, which represented worldwide a share of 0.74%.

Based on the annual levels presented above, the average level for the whole analyzed period was: 27,469,562 tons at world level, with a different percentage from a continent to another: 0.05% Oceania (13,706 tons); 5.08% Americas (1,394,908 tons); 6.29% Africa (1,727,293 tons); 31.24% Europe (8,580,714 tons); 57.34% Asia (15,752,941 tons).

Table 1. Barley - World Imports (2011–2013)

Specif.	2011		2012			2013			Average 2011 – 2013		
	Tons*	Str.** %	Tons*	Str.** %	2012/ 2011**	Tons*	Str.** %	2013/ 2012**	Tons**	Str.** %	Average/ 2013**
Africa	1,238,354	5.04	1,615,330	5.83	130.44	2,328,194	7.72	144.13	1,727,293	6.29	74.19
Americas	1,209,827	4.92	1,375,281	4.97	113.68	1,599,617	5.30	116.31	1,394,908	5.08	87.20
Asia	12,585,576	51.22	16,521,591	59.72	131.27	18,151,656	60.17	109.87	15,752,941	57.34	86.79
Europe	9,525,839	38.76	8,142,209	29.43	85.47	8,074,093	26.76	99.16	8,580,714	31.24	106.27
Oceania	13,674	0.06	12,837	0.05	93.88	14,607	0.05	113.79	13,706	0.05	93.83
Total	24,573,270	100	27,667,248	100	112.59	30,168,167	100	109.04	27,469,562	100	91.05
EU	9,086,298	36.98	7,406,651	26.77	81.51	7,753,432	25.70	104.68	8,082,127	29.42	104.24
Romania	186,770	0.76	138,024	0.50	73.90	222,758	0.74	161.39	182,517.3	0.66	81.94

* http://faostat3.fao.org/download/T/TP/F (02.04.2016)
** own calculation

The dynamics of the indicator highlights some aspects such as: the indicator level for Africa performed strictly upward, the increases in specific years (dynamic components of the series) besides the term of reference are by 30.44% in 2012 and 44.13% for 2013. The average in the period was below 74.19%. The Americas had a similar dynamics to that shown above, the increase in 2012 was by 13.68%, and by +16.31% in 2013. The period average decreased by -12.80%. For Asia the indicator exceeds the comparison term in 2012 (+31.27%), overtaking also for 2013 (+9.87%), while the period average is characterized by reductions compared to the term of reference (-13.21%). Europe is characterized by a downward trend of this indicator, so the reference basis was not reached in 2012 (-14.53%), 2013 (-0.84%) and the average exceeded the term of comparison by 6.27%. The indicator development is uneven for Oceania (-6.12% in 2012, +13.79% for 2013, -6.17% as the average of the period - all these variations recorded to the terms of reference). At world level, the indicator has increased, bringing forward the reporting basis of 1.12 and 1.09 for the years 2012 and 2013, the average registering a fall of 8.95% compared to the previous term of the dynamic series. For the European Union, there is an uneven trend of this indicator as its level decreased in 2012 (-18.49%), it has grown in the year 2013 and the period average (+4.68 and +4.24% respectively). For Romania, imports have registered a fluctuating quantitative trend. So, for 2012 it appear decreases compared to 2011 (-26.10%), in 2011 there were increases compared to basis of reporting (+61.93%) and the average was by 18.06% lower compared to the previous term of the dynamic series.

In 2011, at world level, it was recorded 25,356,209 tons barley exports, to which the contribution by continent was: 20,715 tons Africa (0.08%), 598,374 tons Asia (2.36%), 4,485,358 tons Oceania (17.69%), 3,364,815 tons the Americas (13.27 %) and 16,886,947 tons Europe (66.60%). The European Union carried out 12,602,028 tons exports, representing 49.70% of the overall global indicator. Romania exported 763,541 tons of barley, which meant 3.01% of the global level of the indicator.

Table 2. Barley - World Exports (2011-2013)

Specif.	2011		2012			2013			Average 2011 – 2013		
	Tons *	Str. ** %	Tons *	Str. ** %	2012/ 2011**	Tons *	Str. ** %	2013/ 2012**	Tons **	Str. ** %	Aver./ 2013**
Africa	20,715	0.08	14,169	0.05	68.40	15,704	0.05	110.83	16,862.7	0.06	107.38
Americas	3,364,815	13.27	5,222,717	18.35	155.22	4,919,684	15.85	94.20	4,502,405.0	15.91	91.52
Asia	598,374	2.36	599,827	2.11	100.24	824,865	2.65	137.52	674,355.3	2.38	81.75
Europe	16,886,947	66.60	17,512,101	61.53	103.70	20,221,400	65.02	115.47	18,206,816.0	64.32	90.04
Oceania	4,485,358	17.69	5,111,238	17.96	113.95	5,120,279	16.46	100.18	4,905,625.0	17.33	95.81
Total	25,356,209	100	28,460,052	100	112.24	31,101,932	100	109.28	28,306,064.0	100	91.01
EU	12,602,028	49.70	11,457,926	40.26	90.92	15,397,299	49.51	134.38	13,152,418.0	46.47	85.42
Romania	763,541	3.01	688,075	2.42	90.12	1,132,938	3.64	164.65	861,518.0	3.04	76.04

* http://faostat3.fao.org/download/T/TP/F (02.04.2016)
** own calculation

In case of 2012, the continents have registered levels of exports from 14,169 tons in case of Africa, up to 17,512,101 tons for the European continent, so that the world level of the indicator was 28,460,052 tons. In 2012, the continents contributions percentage was 0.05% for Africa (14,169 tons), Asia 2.11% (559,827 t), 17.96% Oceania (5,111,238 tons), 18.35% Americas (5,222,717 tons), 61.53% (17,512,101 tons) Europe. Worldwide, the European Union and Romania held 40.26% and 2.42% of the overall level of exports (11,457,926 tons and 688,075 tons respectively).

If we analyze the specific situation of 2013, it can be seen that the main exporters were Europe, Oceania and Americas: 20,221,400 tons, 5,120,279 tons, respectively 4,919,684 tons (65.02%, 16.46% and 15.85%), while Asia and Africa registered 824,865 tons and

15,704 tons (2.65% and 0.05%, respectively). As a result, the total global exports reached an amount of 31,101,932 t. In this context, it may be seen a substantial contribution of the European Union: 49.51% (15,397,299 tons) and a modest contribution of Romania - 3.64% (1,132,938 tons). The period average was 28,306,064 tons at global level, whose structure can be found in the continental contributions: 0.06% Africa (16,862.7 tons); 2.38% Asia (674,355.3 tons); 15.91% Americas (4,502,405 tons); 17.33% Oceania (4,905,625 tons); 64.32% Europe (18,206,816 tons).

In Romania, the average share in the world quantitative exports of barley was 3.04% - with variations from 2.42% to 3.64% for the years 2012 and 2013.

The quantities of barley exported at continental and global level highlighted a number of issues such as: the African continent indicator showed uneven developments, sub-unitary and over-unitary values of the indices of the dynamics. Thereby there were occurred decreases by 31.60% in 2012 compared to 2011, then in 2013 it is surpassed 1.10 times the comparison basis, while the average for the period recorded an increase by 7.38% compared to previous period of the dynamic series. The Americas are characterized by a oscillating dynamics, increases being recorded only in 2012 (+35.22% compared to the first term of the dynamic series), otherwise, being decreases (-5.80% and -8.48% respectively for 2013 and period average). On the Asian continent, it was noticed only an upward trend of the indicator, so the dynamics is dominated by levels of the sub-unitary component indices. The increases recorded in 2012 (+0.24%) were followed by further increases in the volume of the indicator for 2013 (+37.52% compared to the previous term of the dynamic series). The average period is with by 18.25% lower than the baseline (2013).

Europe presents an increasing trend of the indicator, the growth in 2012 being (+3.70%), and in 2013 (+15.47%) and the decreases for the period average have been -9.96%).

The exports of Oceania have developed somewhat similarly to the European ones. The exceedances of the terms of reference were 13.95% in 2012 and 0.18% for 2013 and negative differences towards them ranged at 4.19% for the period average.

At global level, the indicator has presented a growing trend, the surplus being by 12.24% for 2012, by 9.28% for 2013, while the period average was lower compared to the previous term of the dynamic series (-8.99%).

In case of the European Union, there is an uneven dynamics of exports. They decreased by 9.08% in 2012 compared to the specific situation of 2011, then in 2013 increased by 34.38% over the previous period of dynamic series. The period average was lower than the reporting term (2013) by 14.58%.

Romania has experienced a fluctuating trend in exports of barley, demotions manifested in 2013 (1.64 times compared to 2012). For 2012 and the period average there were found decreases by 9.88% and 23.96% respectively compared to the baseline.

Table 3 shows the trade balance of world barley trade.

The world trade balance for barley was weak in 2011 (USD -277,933 thousands), due to the surpluses recorded in Americas, Europe and Oceania: USD +534,594 thousands, USD +2,139,004 thousands and USD +1,262,187 thousands, and also due to the specific deficits registered especially by Africa and Asia: -USD 402,012 thousands, and respectively USD 3,811,706 thousands.

Table 3. Barley - The commercial balance of global trade - USD thousand (2011-2013)[*]

Specif.	2011	2012	2013	Average 2011 – 2013
	export - import ±	export - import ±	export - import ±	export - import ±
Africa	-402,012	-474,607	-679,423	-518,680.3
Americas	+534,594	+943,638	+823,211	+767,148.0
Asia	-3,811,706	-4,891,158	-5,523,424	-4,742,095.7
Europe	+2,139,004	+2,519,862	+3,151,573	+2,603,479.0
Oceania	+1,262,187	+1,360,387	+1,478,797	+1,367,124.0
Total	-277,933	-541,878	-749,266	-523,025.0
EU	+1,261,958	+1,175,963	+2,094,461	+1,510,794.0
Romania	+154,253	+156,573	+237,915	+182,913.7

[*] own calculation

In case of 2012, the trade balance keeps its deficient character (USD -541,878 thousands) as in the previous year, resulting mainly from the African and Asian deficits (USD -474,406 thousands and USD -4,891,158 thousands), which could not be offset by surpluses of other continents: USD +943,638 thousands, USD +2,519,862 thousands and USD +1,360,387 thousands, the specific values for Americas, Europe and Oceania respectively.

When referring to the situation in 2013, it can be seen a deficit of the trade balance in Africa and Asia (USD -679,423 thousands, respectively USD -5,523,424 thousands), while the surplus was recorded in the Americas, Europe and Oceania USD +823,211 thousands, USD +3,151,573 thousands and USD +1,478,797 thousands. Therefore it was noticed a global trade balance deficit (USD -749,266 thousands).

The average of the period (Fig. 1) reflects a commercial balance deficit (USD -523,025,000), due to the situation at the continental levels: USD 2,603,479 thousands in Europe; USD +1,367,124 thousands in Oceania; Americas USD +767148 thousands; USD -518,680.3 thousands in Africa; USD -4,742,095.700 thousands in Asia.

The European Union is characterized by a surplus in the commercial balance for barley, averaging USD +1,510,794 thousands, while the values by year have been: USD +1,261,958 thousands in 2011, USD +1,175,963 thousands in 2012 and USD +209,4461 thousands in 2013 (Fig. 2).

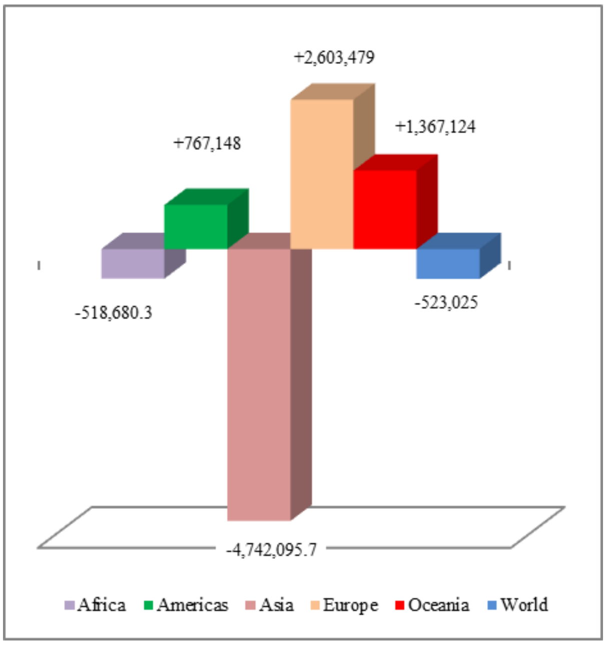

Fig. 1. Barley. Global trade balance, the period average

(Thousands $)

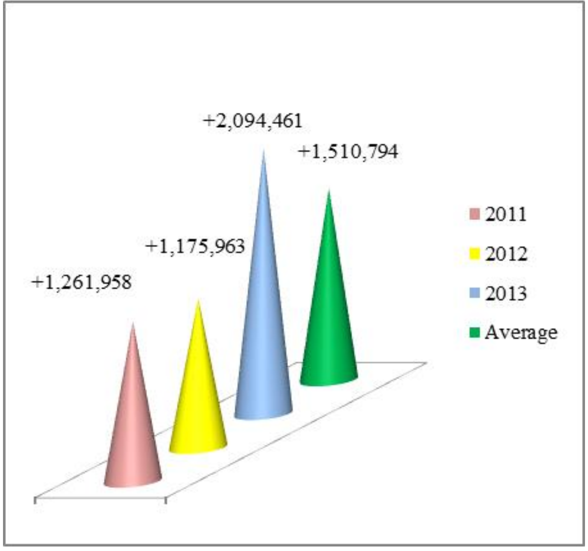

Fig. 2. Barley. The EU trade balance (Thousands $)

Romania registered a positive trade balance for barley in the whole period (Fig. 3): USD +154,253 thousands in 2011, USD +156,573 thousands in 2012, USD +237,915 thousands in the year 2013, and USD +182,913.7 thousands for the period average.

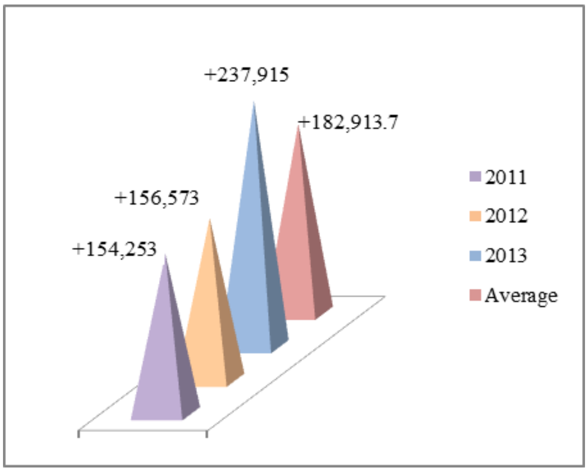

Fig. 3. Barley. Romania's trade balance, (thousand $)

CONCLUSIONS

The study led to the following main conclusions:

- the predominance of Asia at the imported quantities (57.34%), followed by Europe with 31.24% and weights quite low for Africa, Americas and Oceania: 6.29%, 5.08% and 0.05%;
- in terms of value, imports were dominated by Asia (58.32%), followed by Europe (29.82%), the lowest weights being recorded

by Africa, Americas and Oceania (6.28%, 5.53% and 0.05% respectively);

- in terms of quantitative exports, Europe is the main market operator (64.32%), while Americas and Oceania weights tend towards 20% (15.91% and 17.33%), Asia and Africa accounting for reduced weights (2.38% and, respectively, 0.06 %);
- regarding the value of exports, Europe remains the main global player, followed at a considerable distance by Oceania and Americas: 64.76%, 17.36% and 15.60% respectively (increases for the first two units compared to the continental quantitative of the indicator decreases for Americas). Rest of the world recorded either increases or decreases in the global weights compared to the situation of the exported quantities: Africa from 0.06% to 0.12%, Asia from 2.38% to 2.16%. Romania has a share of 2.94% (-0.10% compared to the quantitative level of the indicator) and the European Union registered an increase of 2.19% (from 46.47% to 48.66%);
- the global balance is severely deficient, both in average and sequentially. This situation is caused by the deficit recorded by Asia, which is a decisive actor on the global market barley, and by Africa, the rest of the world recording surplus balances;
- The European Union is characterized by a surplus balance, and we can say that it decisively influenced European situation;
- Romania has a favorable situation, the surplus character of the balance was constantly noticed along the analyzed period.

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THE IMPACT OF THE EXCHANGE RATE ON TRADE IN AGRIFOOD PRODUCTS AS A COMPONENT PART OF THE BALANCE OF FOREIGN PAYMENTS IN THE REPUBLIC OF MOLDOVA

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Abstract

The purpose of this paper is to determine and analyze the impact of the exchange rate on trade in agri food products and finally, on the payments balance of the Republic of Moldova. In order to achieve the intended purpose there will be performed a correlation between the evolution of the balance of payments and the exchange rate, which is explained by the fact that when the volume of exports is higher than that of imports and, therefore the trade balance is positive or excesses the domestic one, there will be a larger supply of foreign currency on the market and the national currency will register a trend of its appreciation. Instead, the competitiveness of domestic products will reduce because they will become more expensive. In the research process there was used the method of induction, initially by general information about the exchange rate and balance of foreign payments, about its structure, and subsequently there was used the analysis of concrete data on trade in agri food products and the balance of payments as well as the dynamics of the national currency depreciation. Having applied the method of deduction it was concluded that under a deficient trade balance, when imports exceed exports, there will be an increase in the demand for foreign currency, the national currency will depreciate and domestic goods will be cheaper, which means more competitive. Statistical data and the calculations show a depreciation of the national currency in recent years, due to the superposition of three major events: the depreciation of national currencies from the region; the reduction of the currency supply as a result of a reduction of exports, remittances and foreign direct investments; the increase in demand for foreign currency as a result of the withdrawal of the capital from the country.

Key words: *agri food products, trade balance, the balance of foreign payments, trade, exchange rate, national currency*

INTRODUCTION

The main tool which helps to carry out the accounting and control of the economic relations with foreign countries is a balance of foreign payments. It constitutes an important source of information about how a country participates in international trade of goods, services and capital, about the competitiveness of its economy, about its economic strength [1].

The balance of payments is based on registering flows (transactions) between residents and non-residents accounted for over a period of time, usually for one year. The balance of payments records the receipts as assets, respectively outstanding receivables during the reported period and it records payments as liabilities, respectively outstanding liabilities during the same period, whether commercial or financial operations, which generated them, were made in this period or earlier [4].

The balance of payments operates with flows and stocks, registering economic developments in a certain reference period.

The balance of payments is a statistical and accounting document, which records all economic transactions (trade, monetary and financial transactions) occurring between resident business entities and foreign countries over a period of time, usually one year. The balance of payments is compiled by the Central Bank, based on the data provided by the banking system and the customs service.

As any balance, the balance of payments is composed of two parts:

1. currency inflows into the country (credit) arising from the following transactions: exports of goods and services; financial aid or loans granted to a certain country by a foreign

country; money transferred home by people working abroad; investments of foreign companies in national territory; purchase of shares or bonds by foreign economic entities on the national financial market.

2. currency outflows from the country (debit) arising from the following operations: payment of imports; the investments of economic agents abroad; transfers of profits of foreign companies in countries of origin; cash deposits by economic agents and individuals in foreign banks; repayment of loans and credits contracted with foreign banks and foreign governments or international financial organizations [2].

The currency balance is evidenced by the balance of the balance of payments and its balancing mode. The balance of the balance of foreign payments is most strongly influenced by the trade balance situation, a component of the balance of foreign payments which highlights the contribution of the real economy to ensure the equilibrium of the exchange rate.

The exchange rate is the price of one currency expressed in another currency which, in accordance with Regulation no. 2 of 13/01/1994 on regulating the currency in Moldova, is established by the National Bank of Moldova (official rate) or by authorized dealers (course, exchange rate, buying and selling rate) [7].

The official exchange rate is the price of MDL against the currencies of other countries. The official rate is calculated based on the exchange rates established by licensed banks in transactions of purchase / sale of currencies performed with their clients and other banks. Thus, the official exchange rate reflects the relation between supply and demand of currencies in the forex market in the country.

In Moldova there is a floating currency regime. The National Bank intervenes in the forex market when there is a need to mitigate excessive exchange rate fluctuations, primarily through direct purchase or sale of foreign currency.

The evolution of the trade balance influences the exchange rate by the fact that when the volume of exports is higher than that of imports and therefore the trade balance is positive or in excess, on the domestic market there will be recorded a larger supply of foreign currency and the local currency "will strengthen ", i.e. there will be a trend of the national currency appreciation. Instead, the competitiveness of domestic products will reduce because they will become more expensive. Under a trade balance deficit, when imports exceed exports, the demand for foreign currency will increase, the national currency will depreciate and the domestic goods will be cheaper, i.e. more competitive.

Purchasing power parity affects the exchange rate for the long term, since it oscillates around the changing parity of purchasing power of currencies [6].

MATERIALS AND METHODS

The research studies the trade in food products as part of the balance of foreign payments of the Republic of Moldova as well as the modification of the exchange rate during 2013-2015.

In the research process there was used the method of deduction, initially by general information about the exchange rate and balance of foreign payments, about its structure, and subsequently there was used the analysis of concrete data on the accounts and the balance of the balance of foreign payments as well as the dynamics of the national currency depreciation. The results obtained by the analytical calculation are shown by means of the tabular method and the graphical method. The conclusions and recommendations were formulated using the method of deduction and scientific abstraction.

RESULTS AND DISCUSSIONS

During 2015, the external sector of the economy of the Republic of Moldova has been affected by the economic recession recorded by the main partners in the CIS (The Russian Federation and Ukraine), which had a substantial negative impact on exports and on personal remittances. The application, from 1.09.2014, of the Deep and Comprehensive Free Trade Agreement (DCFTA) with the EU has had a positive impact on Moldovan exports to the European Union (which grew by 44.18 million USD or 6.1 percent compared to 2014, without goods for / after processing), but that was not enough to fully compensate the decrease in exports to the CIS (which fell by 233.34 million USD or 32.2 percent compared to 2014, without goods for / after processing). Personal remittances received by the residents of the Republic of Moldova decreased from 24.1 percent in relation with GDP in 2014 to 21.8 percent in 2015, mainly from reduced inputs from the Russian Federation [5].

As a result of current and capital transactions carried out by the economic agents, residents of the Republic of Moldova with foreign operators in 2015, the necessary financing net (the sum of current and capital account balances from the balance of payments) decreased by 6.0 percent compared to 2014 and amounted to 441.41 million, which is 6.8 percent in relation with GDP (5.9 % in 2014) (Table 1).

In 2015 the absolute value of the current account deficit reduced by 17.7% compared with 2014 on account of decreasing GDP. However, the current account deficit relative to GDP has remained virtually constant, constituting 7.2%. The negative evolution of primary income balance has influenced current account reducing it by 4.1 p.p. This reduction was caused primarily due to the increase of income payments as dividends, interests, etc, by 2.3 p.p. that have returned to foreign investors, followed by reduction of residents workers' compensation for the work performed for the patrons non-residents by 1.3 p.p.

As to the surplus registered at secondary income there were also recorded reductions - namely by 2.7 p.p. in 2015 compared to the previous year 2014 as a result of reduced inflows of private transfers by 1.1 p.p. and of reduced external support (international cooperation, both at government and private level) by 1.4 p.p.

Reducing income obtained by the residents contributed to a decrease in domestic demand, and respectively, in imports of consumer goods.

Table 1. The main components contributing to the evolution of current account of the balance of payments in the Republic of Moldova

Indicator	2014	Q I 2015	Q II 2015	Q III 2015	Q IV 2015	2015	Share change 2015 / 2014, p.p.
	% relative to GDP						
Current account / GDP	-7.1	-10.5	-8.1	-6.3	-4.6	-7.2	-0.1
Trade balance / GDP	-36.7	-34.8	-31.1	-27.8	-27.9	-30.0	6.7
Primary income balance / GDP	10.4	6.8	4.4	7.2	6.4	6.2	-4.1
Secondary income balance / GDP	19.3	17.4	18.7	14.3	16.9	16.6	-2.7
Capital account / GDP	1.2	-0.3	0.6	0.5	0.5	0.4	-0.8
Necessary net financing (the sum of current and capital accounts / GDP	-5.9	-10.8	-7.5	-5.8	-4.1	-6.8	-0.9

Source: elaborated by the author based on data provided by [8]

Simultaneously with the stop of economic activity, and respectively, with the decrease of imports of raw materials and capital goods by businesses, it contributed to a decrease in imports of goods and services by 5.1 p.p. relative to GDP. At the same time, the exports of goods and services increased by 1.6 p.p. so that Moldova's trade deficit reduced by 6.7 p.p. in 2015 compared to 2014. The reduction by 6.8 p.p. recorded at incomes and the increase in foreign trade balance in goods and services by 6.7 p.p. compensated each other, which preserved the relationship between the current account and gross domestic product in 2015 compared with the previous year 2014.

The main source of coverage of the necessary financing net in 2015 (Table 2), reflected in the financial account of the balance of payments, was the reserve assets of the state, especially in the first quarter of 2015 used by the National Bank for the interventions in the domestic exchange market with the aim of neutralizing excessive fluctuations of the exchange rate of MDL.

The external trade in goods and services is included in the structure of the current account of the balance of payments and is its most essential component, so it is necessary to analyze the country's main trading partners (Fig. 1).

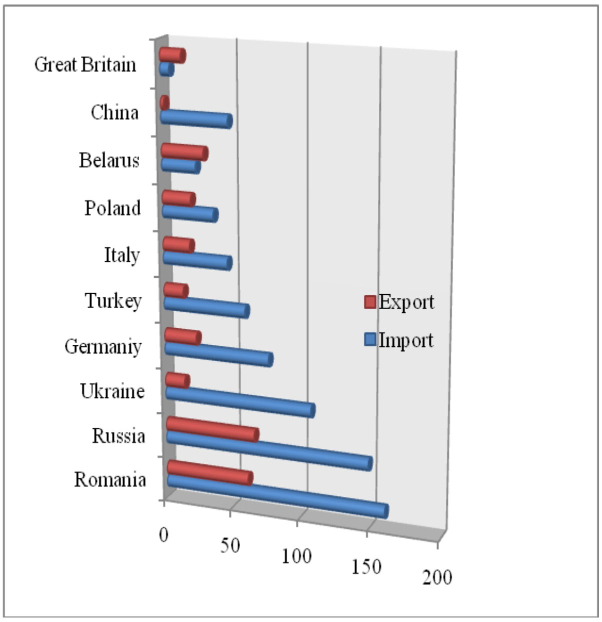

Fig. 1. The main trade partners of the Republic of Moldova in 2015
Source: elaborated by the author based on data provided by [8]

Exports of goods from the Republic of Moldova amounted 1495.42 mil. US dollars, of which 51.5 percent were directed to EU countries, 32.8 percent were delivered to CIS countries, the remaining 15.7 percent were exports to other countries. In 2015, the prevailing share in the structure of exports to the European Union was to Romania (61.51 million USD), Germany (23.9 million USD), Great Britain (15.46 million USD), Italy (19.89 million USD), Poland (21.11 million USD) and Turkey (14.69 million USD). The positive evolution of exports to European Union countries also took place because of the implementation of Deep and Comprehensive Free Trade Agreement with the EU.

In 2015, Moldova imported goods totaling to 3642.68 million USD. The largest share of 53.3 percent (1939.8 million USD) in total imports belongs to the goods from EU countries, their value decreasing by 24% compared with 2014. Imports from CIS countries decreased by 30.2%, having the share of 29.1% (1059.41 million USD) of the total imports. Imports from other countries were 17.7% (643.47 million USD), they dropped by 23.9%.

The main suppliers of goods to Moldova in 2015 were Romania, Russia, Ukraine, Germany, Turkey, China, Italy, Poland, Hungary, Belarus, the aggregate value of imports from these countries accounted to 78.3 percent of the total imports.

Table 2. The analysis of the capital account of the balance of foreign payments in the Republic of Moldova

Indicator	**Years**			**Absolute deviation, 2015 compared to the years:**	
	2013	**2014**	**2015**	**2013**	**2014**
Capital transfers, Credit, million dollars USA.	110.39	175.92	97.29	-13.03	78.63
Capital transfers, Debit, million. dollars, USA.	52.42	80.88	47.38	-4.96	-33.42
Sold, million dollars USA	57.97	94.54	22.83	-35.14	-71.71
Capital transfers, million dollars USA	57.97	94.44	49.91	-8.06	-44.53
Public administrati onCredit, million dollars USA	93.37	156.98	89.34	-4.03	-67.64
Other sectors	-354	-62.54	-66.43	-31.03	-3.89

Source: elaborated by the author based on the data provided by [8]

As it is seen from the data presented in Table 2, in 2015 the capital account of the balance of payments recorded a positive balance in the amount of 22.83 million USD, which represents a decrease by 35.14 million USD compared to previous years, and respectively 71.71 million USD in absolute value and by 60.62%, respectively, 75.85% in relative size. The public administration received external grants related to investment projects worth 89.34 million USD, while other sectors registered net outflows worth 66.43 million USD.

If we analyze the trade in food products, the situation is different in dynamics (Fig.2).

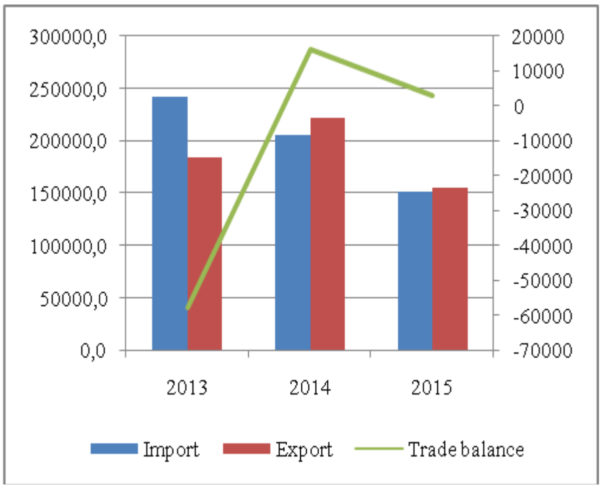

Fig. 2. Evolution of trade in agri food products in the Republic of Moldova in 2013-2015

Source: elaborated by the author based on data provided by [9]

Analyzing the data presented in Figure 2 we can see that in 2015 compared to previous years 2013 and 2014 both imports and exports of food products reduced. Thus, in 2015 compared to 2013 exports decreased by US $ 29,935.4 thousand, and if compared to 2014 the decrease amounted to US $ 67,302.5 thousand, caused mostly by reduced cereal and cereal products exports (-35.9%), meat and meat products (-73.5%), vegetables and fruit (-5.5%), fixed, crude, refined or fractionated vegetable fats and oils (-7.1%), food for animals (-25.2%), raw and processed tobacco (-24.1%),

As to the imports, we observe a reduction of US $ 2,539.7 thousand in 2015 compared to the base year 2013 and in comparison with the previous year 2014 US $ 54,075.5 thousand due to falling imports of meat and meat products (-49 2%), cereals and cereal products (-22.1%), dairy products and eggs (-20.9%), livestock (-52.2%), food for animals (-11 3%), sugar, sugar products; honey (-24.8%), while imports of seeds and oil products increased (+ 18.7%) [10].

These changes helped reduce the trade deficit in agricultural products with US $ 60789 thousand in 2015 compared to 2013, and compared to 2014 trade surplus reduced by US $ 13,227 thousand.

The exchange rate changes also have an influence on foreign trade, and therefore on the balance of foreign payments. Statistics and calculations (Fig. 3) show a depreciation of the national currency in recent years, due to the superposition of three major events: the depreciation of national currency in the region (Russia, Ukraine); the reduction of currency supply as a result of a reduction of exports, of remittances and of foreign direct investments; the increase of the demand for foreign currency as a result of the withdrawal of the capital from the country. The first two factors reflect the difficult economic and political conditions in the country until December 2014.

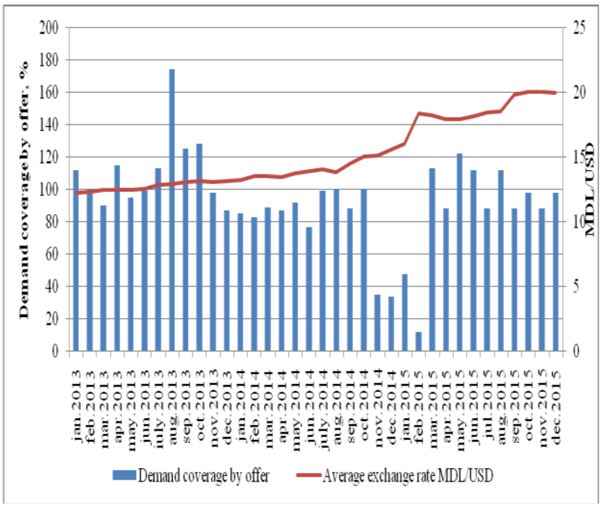

Fig. 3. Coverage of net demand for foreign currency by businesses through the net supply of foreign currency from individuals

Source: elaborated by the author based on the data provided by [8]

The third factor influenced the subsequent devaluation of the national currency i.e.

increasing demand for foreign currency caused panic with people, they having negative expectations.

From the data of Figure 3 we can see that towards the end of 2015 the national currency appreciated, and its average exchange rate against the US dollar fell from 19.9935 in November to 19.8295 in December, or by 0.8 percent. Regarding the currency structure of net foreign currency from individuals, the largest share went to the single European currency (62.4%), followed by the US dollar (19.8%) and Russian ruble (16.3%).

In 2014, the local currency market recorded a crucial gap between demand and supply of foreign currency. This was caused by reducing the supply of currency, boosted by the restrictions imposed by Russia on Moldovan exports and by reducing foreign currency transfers to individuals.

Negative developments have widened in the fourth quarter of 2014, when remittances from abroad reduced by approximately 20% compared to the same period of 2013. In November 2014, exports decreased by 18% compared to November 2013.

In 2014 the net supply of foreign currency from individuals amounted to 2048.0 million USD, which is 30.2 % less compared to 2013, and covered in proportion of 78.2% net demand currency by businesses. In these circumstances, within the pursued monetary policy, in 2014 the National Bank sold on the local market the amount of 418.5 million USD as foreign exchange interventions, partially covering the shortage of foreign currency. During 2014 the national currency depreciated against both the USD and the Euro (EUR) by 19.6% and 5.7% respectively.

The depreciation trend of the Moldovan leu against the US dollar in 2014 had a regional dimension including the strengthening of US dollar position on international markets due to the US economic recovery. Thus, Euro also depreciated towards the USD – by 13.1%, Romanian leu – by 13.6%.

During 2014 Ukrainian hryvna depreciated in higher proportions against the US dollar - by 92.0% and the Russian ruble - by 72.5%.

Depreciation pressures on the domestic currency continue to maintain in 2015. This fact attests in the condition of the persistence of the developments recorded in 2014, characterized by expanding the gap between demand and supply of currency. In January 2015, the net purchases of foreign cash by banks halved to 71.0 million USD or 55.3 percent compared with January 2014, while net demand for foreign currency from legal persons (150.5 million USD) reduced to a smaller extent - by 21.0 percent. During this month the demand for currency is mainly generated by the importers of energy resources. Thus, the demand was covered by the offer in proportions of 47.2 percent compared with 83.4 percent in January 2014. In these circumstances, the National Bank intervened in January by selling 114.4 million US dollars on the local market thus dampening currency depreciation. Measures taken by the National Bank aimed to stimulate higher interest rates on deposits in lei and to encourage savings in the national currency, which will diminish the Moldovan leu depreciation pressures.

Currency depreciation in 2015 was a continuation of the trend that began in the second half of 2011 and accelerated in 2014. Several factors caused these changes, and namely: decrease in remittances in US dollars and reducing exports to CIS countries. So, Moldova's economy goes through a slow process of adaptation to internal and external conjuncture and the exchange rate is a key tool in this respect.

The currency depreciation has accelerated in 2013, when on the pretext of maintaining a desired level of inflation, the National Bank made purchases of currency in the third quarter (247 million USD), inducing the market to a new higher equilibrium rate level MDL / USD. Later, during the first three quarters of 2014, the determining factor of the devaluation of the national currency was the US dollar appreciation (Fig. 3). However, in the last quarter of the year a more pronounced depreciation of the leu had other predominant factors. As to the currency supply, things are clear: reduction in the fourth quarter of the currency inflow from remittances and exports by 20.2, respectively 11.4%, imports, as the largest carrier of currency demand, recorded in last 3 months of 2014 a decrease by 4.7% compared to the same period of 2013. Meanwhile, the National Bank data show an increase in currency demand, especially from legal entities.

These developments can be explained by suspicious transactions in the autumn of 2014 from 3 commercial banks (Banca de Economii S.A., BC”BANCA SOCIALĂ” S.A. and B.C. ”UNIBANK” S.A), which had as purpose the purchase of massive amounts of currency from the market and transferring them abroad.

Sharp devaluation of the national currency and of the essential foreign exchange fluctuations accelerated and scared the population (migration of currency savings from lei into foreign currency, reluctance to sell the accumulated currency, etc.), accompanied by abundant speculations.

If we consider economic agents, foreign exchange course influences domestic producers by increasing efficiency in order to be competitive both on the domestic and foreign markets. On the one hand, if the currency is overvalued, it generates some risks: obstacles to the sustainable development of the national economy by creating additional impediments to export oriented traders. An expensive currency makes domestic products for international markets to be more expensive, so decreasing considerably the chances of their success. For the Republic of Moldova, this issue is one of importance. Unlike other countries in the region, the Republic of Moldova lacks natural resources that it could export through international markets as to guarantee in this way flows of foreign currency into the local financial system. Therefore, export is the source that ought to provide the necessary foreign currency to cover imports expenditures. Since the coverage of imports by exports is low, the capital scarcity is largely provided from the remittances from abroad and / or by international donors.

MDL devaluation caused a slight reduction in imports in the first period of 2014, but the advantages of leu’s gradual recovery to its real value will be felt in the medium and long term. Local producers will become more competitive when they export to international markets, Moldovan consumers will choose more local products as the foreign products will be more expensive and the economy as a whole will move from a model based on consumption of imports to one focused on exports and international competitiveness, thus gradually balancing the trade balance of the country.

The effects of exchange rate changes depend on foreign trade structure and on the financial situation of the participants in international trade. During the period of practicing fixed exchange rates, currency devaluation was the expression of the authority decision to reduce the purchasing power of the currency in relation to gold and other currencies, and revaluing reflects the increasing purchasing power of the currency against gold and other currencies.

In terms of floating courses, devaluation has an implicit character due to declining purchasing power of the currency on the market, according to supply and demand, it is called depreciation, and implicit revaluation reflects the increasing purchasing power of the currency on the market, which means that the currency is appreciated.

Appreciation or revaluation of the currency expresses increasing purchasing power against other currencies. Currency depreciation boosts exports and stops imports since they are paid in depreciated currency. Importers from other countries reduce goods quantities as they need larger amounts to procure necessary goods from a country whose currency has depreciated. Depreciation favors the debtors who repay their debts in depreciated currency and disadvantages the creditors.

Currency appreciation reduces the exports and stimulates the imports of a country. Imports increase as a result of lower foreign exchange effort of companies to pay their foreign partners. Currency appreciation penalizes debtors who pay their debts in the stronger currency, and lenders are benefiting from the collection of claims in that currency. [3]

In this context it is necessary to make real appreciation of the exchange rate as it shows a current account deficit of the balance of foreign payments. Since 2014 the deficit has been exceeding 8% of GDP, while the maximum for our country is 5%. The current account deficit shows a low competitiveness of the national economy, which is affected by the real effective appreciation of the national currency.

In recent years MDL depreciation has been influenced by many factors, among which we can mention: the decrease in remittances, of exports and foreign direct investments, which are the main indicators of forming currency sources in the national economy. These reductions have increased in late 2014 and in 2015.

Table 3. The analysis of the indicators of forming currency sources in the Republic of Moldova

Indicator	Years			Absolute deviation, 2015 compared to the years:	
	2013	2014	2015	2013	2014
Transfers of funds from abroad, million USD.	1,609	1,613	1,130	-479	-483
Export, million USD.	1,861	1,780	1,495	-366	-285
Direct foreign investments, million USD.	3,621	3,647	3,539	-82	-108
The official exchange rate of the national currency against the USD, MDL/ USD	12.59	15.62	19.80	+7.21	+4.18

Source: elaborated by the author based on the data provided by [8]

From the calculations in Table 3 we can see that in 2015 the remittances volume fell in absolute size by 479 million USD compared to 2013, and compared to 2014 the remittances fell by 483 million USD in absolute size or about 30% in relative size.

Exports decreased by 366 million USD in 2015 as compared to 2013, and compared to 2014 they decreased by 285 million USD and in relative size the reductions constituted 20% and 16% respectively.

It is obvious that at the same time with a reduction in remittances, exports and foreign direct investments, the national currency depreciated very much, if in 2013 one US dollar could be bought for 12.59 lei, then in 2015 it was bought for 19.8 lei, the depreciation in this period constituted 57%, and compared to 2014-27%.

These calculations make us conclude that one percent of exports reduction corresponds to 0.35% and 0.60% depreciation of the national currency.

Since the end of 2014 and throughout the year 2015 currency depreciation was driven mostly by non-fundamental factors such as panic in society and massive purchase of foreign currency. Reducing the supply of currency, due to reduced exports, remittances and foreign direct investments, is associated with the economic and political conditions in the country and in the region.

According to absorption theory, devaluation can generate the change of the trade balance through its effects on income and absorption. Besides the direct influence exerted by the devaluation of the national income, there is an indirect influence due to the marginal propensity to consume and investment. The effects of devaluation on the balance of payments occurs after a certain period of time at the expense of increasing the competitiveness of goods, expansion of trade relations with other partners, developing production capacity for export and transfer of products offer from one market to another.

CONCLUSIONS

The conducted research allows us to conclude that the dependence degree of the economy of the Republic of Moldova on the outside remains high. According to the analysis of the country's balance of foreign payments for 2015, the current account deficit decreased, but it has an essential share in GDP of 7.54%, transfers to individuals reduced, and the negative balance of goods and services in GDP constituted 37.6%.

The value of the capital account registers a negative trend during the period 2013 -2015. It reduced in 2015 compared to 2013 by 35.14 million USD and by 71.71 compared to the previous year 2014 due to the reduction in capital transfers made by financial and non-financial companies.

The financial account reduced in 2015 compared to 2013 by 109.93 million USD influenced by the reduction of direct investments and portfolio investments, and compared with 2014 the negative balance of this account reduced by 90.48 under the positive influence of direct investments in the national economy.

The existence of the passive balance of the balance of foreign payments has a negative impact on the purchasing power in foreign currency and in general on the country's international relations. It reduces the creditworthiness of the country at the international level and attacks its reputation among foreign investors.

Exchange rate changes also have an influence on the balance of payments. The conducted research demonstrates a depreciation of the national currency in recent years, caused by three major events: the depreciation of the national currencies in the region (Russia, Ukraine); the decrease of the supply of currency as a result of exports, remittances and foreign direct investments reduction; the increase of the demand for foreign currency as a result of the withdrawal of the capital from the country. The first two factors reflect the difficult economic and political conditions in the country until December 2014. The third factor has influenced the subsequent devaluation of the national currency, i.e. increasing demand for foreign currency caused panic among people about the negative expectations.

The persistence of the currency depreciation factors, particularly reduced remittances of funds will discourage domestic consumption and imports of goods and services, including imports of food products. Consequently, a balance of the trade balance will attest, and a stabilization of the exchange rate dynamics of the national currency will take place.

In order to improve this situation and to reduce balance of payments deficit through the exchange rate policy it is necessary to take steps both for short and long term. In this regard it would be helpful for the short time period to reduce imports, which will generate an appreciation of the national currency and a reduction in the balance of foreign payments deficit. For the long period of time, however, this measure will only postpone solving the real causes that generated the trade deficit.

Another solution would be to attract foreign direct investments and portfolio investments that will contribute to the rebalancing of the balance of payments by foreign capital attracted in economy, which can reduce pressures on the exchange rate, generated by trade balance deficit.

A balancing measure would also reduce the effects of the evolution and especially of the exchange rate depreciation on the trade balance. Depreciation stimulates foreign demand and discourages domestic demand.

In order to reduce the current account deficit of the balance of foreign payments it is necessary to increase the competitiveness of domestic products (including agri food products), subject to international transactions and to follow the fluctuations of the national currency against other currencies, because while the national currency evolves with depreciation trend, in terms of international transactions exports are encouraged and imports reduce.

In order to increase the country's creditworthiness and improve its reputation at the international level it is necessary to solve existing political problems in order to boost exports that will reduce the balance of payments deficit.

In order to reduce the balance of passive balance of payments it would be necessary for the state to support production, with the efficient value on the foreign market in order to increase export prices, to increase incomes in convertible currencies and to promote investment policy by attracting foreign capital.

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ANALYSIS OF WOMEN ENTREPRENEURSHIP DEVELOPMENT IN AGRIBUSINESS SECTOR IN BENUE STATE, NIGERIA

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Abstract

This study carried out an assessment of women entrepreneurship development in agribusiness sector in Benue State, Nigeria. It specifically examined women's attitude towards the sector; their level of participation and the impact of participation on agribusiness practices and productivity; socio-economic factors influencing their involvement and constraints faced in agribusiness entrepreneurship in the study area. A multi-stage sampling technique was used to select 120 respondents with a well-structured questionnaire. Descriptive statistics and probit regression model technique were used to analyze the data collected. The study showed that majority of the respondents expressed positive attitude towards agribusiness entrepreneurship. Also, the study showed low participation of respondents in agribusiness entrepreneurship programmes. However, the fewer participated respondents' recorded high improvement in their agribusiness practices. Result of the probit regression analysis revealed that access to loan, government support, household size, level of income, attitude, E.D.Ps, age and constraints were either positively or negatively related to the level of women involvement in agribusiness entrepreneurship at different levels of significance. Women entrepreneurs in agribusiness should be encouraged to create their own jobs and become self-employed since the opportunities of getting employment in either government or in private organization is currently almost declining. Government should embark on realistic entrepreneurial support services in agribusiness sector to stimulate self-employment opportunities for women for their personal survival and national development.

Key words: *agribusiness, development, entrepreneurship, women, Nigeria*

INTRODUCTION

Women entrepreneurs have been identified as a major force for innovation, job creation and economic growth [10]. Many women are entrepreneurs however; the global effect of woman entrepreneurship is just beginning to gain intensity. The number of women business owners continues to increase steadily worldwide and it is estimated that the sums owned by women account for between 25 and 33% of all businesses [3; 4].

Today, women entrepreneurs are becoming a growing force in various sectors, especially in the informal sector, in the sense of agribusiness sector. Reports around the world also show women's compelling contribution to business and economic activities in their various countries [4]. Many women have taken up business ownership and are exploiting entrepreneurial opportunities as a means of generating an income and sidestepping the harsh reality and discriminating practices inherent in the corporate sphere. This is because entrepreneurship provides women with unique solutions in overcoming poverty and balancing work and family commitments [15; 7].

In some regions of the world, transformation to a market economy threatens to sharpen gender inequality. Some of these changes are simply the legacy of a gender inequality that exists prior to political and economic returns; other changes reflect a return to traditional norms and value that relegated women to a secondary position. As countries become more democratic and gender inequalities lessen, more productive atmosphere for both sexes is provided [2; 1].

Women's productive activities particularly in industries that empower them economically and enable them to contribute more to overall development, whether they are involved in small or medium scale production activities, or in the informal sector, in the sense of agribusiness or in the formal sector, are not only a means for economic survival but also have positive social repercussions for the women themselves and the social environment [14].

In many societies, women do not enjoy the same opportunities as men. In many transitional economies, progress has been made in opening doors to education and health protections for women but political and economic opportunities for women entrepreneurs have remained limited. Concerted efforts are needed to enable female entrepreneurs to make better economic choices and to transform their business into competitive enterprises and high generating income economic activities [10].

Entrepreneurship is taken to mean a process of creating something different with value by devoting the necessary time and efforts assuming the accompanying, financial, psychological and social risks and receiving the resulting rewards of monetary and personal satisfaction [11]. Entrepreneurship represents an appropriate opportunity for women all over the world, as entrepreneurship respond flexibly to entry, change and innovation. This potential has not yet been realized in an optimal fashion in most developing world. A large number of women work in the informal sector in the sense of agribusiness but their contribution is not included in national accounts [14].

Development of women entrepreneurship in the informal sector in the sense of agribusiness can be seen as one of the necessary conditions for economic growth [12]. Promotion of women entrepreneurship is disappointing in Nigeria and their involvement and role within the wider entrepreneurial setting is constantly undermined [8].

The needs and contribution of women entrepreneurs in the economy seem to be invisible and overlooked. Women entrepreneurs have long been eliminated from the formal sector of the economy especially those in the rural area [9]. As a result of unrelenting and deteriorating economic conditions, a lot of women have been force to work outside normal status and have therefore ventured in varied economic activities while at the same time continuing to perform their traditional household duties; this situation has social and as well as economic implications [6].

Presently, women entrepreneurship in Nigeria is sub-optimized; women entrepreneurs in the agribusiness sector are faced with variety of constraints ranging from access to market, poor linkages to supportive services, finance, undue competition from larger and established agribusiness units, cultural inhibitions, discrimination of all sort, transportation facilities among others. These problems have reduced remarkably the volume and variety of production and employment possible for women entrepreneurs [13].

Hence the need to address the issue because of the high labour absorption capacity of the sector, so as to stimulate employment opportunities for women for their personal survival and national development.

Objectives of the Study

This study is designed to determine women entrepreneurship development in agribusiness sector in Benue state. Specifically, the objectives are to:

(i)ascertain the level of participation of women in entrepreneurship development in agribusiness in the study area;

(ii)determine the extent to which socio economic factors influence the involvement of women in agribusiness entrepreneurship in the study area;

(iii)identify the constraints faced by women in agribusiness entrepreneurship in the study area.

MATERIALS AND METHODS

This study covered Benue state in the middle belt of Nigeria. The state has Twenty-three (23) Local Government Areas. It shares an international boundary with The Republic of Cameroun to the south east and interstate boundaries with Nasarawa state to the north, Taraba state to the east, Enugu, Ebonyi and Cross-rivers states to the south and Kogi state to west. Its capital is Markudi. Its geographic coordinates are longitude 7047’ and 1000’east and latitude 6025’ and 808’ north. It has a population of 4,780,389 (2006, census figure), and occupies a landmass of 32518 square kilometre.

Sampling Procedures. A sample size of 120 respondents was selected using a multi-stage sampling technique. First, six (6) Local Government Areas amongst the Twenty-three (23) local government areas in the state were purposively selected based on the three (3) agricultural zones in the study area. Stage two (2) involved the identification and selection of two (2) communities in each of the selected local government areas while stage three involved a random selection of ten (10) respondents from each of the selected communities which gives twenty (20) respondents for each of the selected local government area.

Below is a table showing the sample size selection from the six (6) local government areas based on the three (3) agricultural zones in the study area.

Table 1. Sample size showing the selection of respondents from the three (3) agricultural zones In the study area

S/n	LGAs	Sample size
1	Adikpo	20
2	Gboko	20
3	Otukpo	20
4	Ogbadibo	20
5	Makurdi	20
6	Kastina-ala	20
	Total	**120**

Source: Field survey data, 2014.

Method of Data Collection. The data for the study were mainly collected from primary source using a well-structured questionnaire.

Method of Data Analysis: Objectives 1 and 3 were analyzed using descriptive statistics such as frequencies, likert-scale and while objective 2 was analysed using probit regression technique.

Model Specification

Objective one (1) was achieved using the mean scores. A five point likert scale questions requiring the respondents to “Strongly agree” “Agree”, “Undecided”, “Disagreed”, or “Strongly disagree” was designed to reflect the attitude of the respondents towards participating in agribusiness entrepreneurship in the study area. The rating of the five point likert-type scale of the study is given as; Strongly agree=5; Agree=4; Undecided=3; Disagree=2; and Strongly disagree=1. Adding 5,4,3,2 and 1 and dividing by 5 gave a mean score of 3.00. Mean score higher or equal to 3.00 was regarded as possession of a positive attitude towards entrepreneurship in agribusiness, whereas any mean response that is lower than 3.00 was regarded as negative attitude.

Objective two (2) was analyzed using probit regression model. The model is specified in line with [5] as;

$Yi^* = \beta 1X1$ ---------------- $n X n + e$

$Yi^* = 0$ if $Yi^* \leq 0$

$Yi^* = 1$ if $Yi^* > 0$

Thus $Yi^* = \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 +$ ---------$+\beta 13X13 + e$

Where

Yi^*= An underlying latent variable that indexes the level of involvement.

Yi^*= Observable dummy variable that indexes the level of involvement (low=1-5 and high = 6-10)

$\beta 1$= A vector of estimated parameter, that is, ($\beta 1$ - $\beta 13$).

Xi= Individual socio economic characteristics of the respondents;

Where

X_1= Age of respondent in years.

X_2= Level of education in years.

X_3= Years of experience in agribusiness practices.

X_4= Access to credit facilities (yes=1, no= 0)

X_5= Marital status (married =1 otherwise=0

X_6= Government support (Yes=1; No=0).

X_7= Innovativeness (innovative=1; otherwise= 0)

X_8= Household size in number.

X_9= Information sources (media=1; otherwise=0)

X_{10}= Level of income of respondents in (N)

X_{11}= Attitude of the respondents to entrepreneurship development in agribusiness sector (positive attitude =1; otherwise=0)

X_{12}= Transportation cost (high=1; otherwise=0)

X_{13}= Effectiveness of entrepreneurship development programmes in agribusiness sector (very effective =1; otherwise=0)

e= Error term.

Objective three (3) was achieved using twelve (12) items based on a 3 point likert-type rating scale of high=3, moderate=2 and low = 1.

RESULTS AND DISCUSSIONS

Evaluation of Women's Attitude Towards Entrepreneurship Development In Agribusiness Sector.

The distribution of the mean scores of respondent's attitude towards entrepreneurship development in agribusiness sector is presented in Table 2.

Table 2. Distribution of the mean scores of respondent's attitude towards entrepreneurship development In agribusiness sector

Attitude statements	**SA**	**A**	**U**	**D**	**SD**	**Mean**
Participation in entrepreneurship development programmes is necessary to achieve increased Agribusiness productivity and Income among women.	30(25.00)	60(50.00)	20(16.67)	10 (8.33)	0	3.92*
Participating in entrepreneurship development programmes is a Prerequisite to effective agribusiness growth.	20(16.67)	65(54.17)	15(12.5)	13(10.83)	7(5.83)	3.65*
Entrepreneurship development in agribusiness leads to increase in sales of agribusiness products among women.	75(62.5)	30(25.00)	10(8.33)	5(4.17)	0	4.45*
Entrepreneurship development skills in agribusiness increases the profit level of agribusiness women.	60(50.00)	40(33.33)	20(16.67)	0	0	4.33*
Participation in entrepreneurship development Projects in agribusiness sector enhances household food security.	24(20.00)	54(45.00)	7(5.83)	20(16.67)	15(12.5)	3.43*
Entrepreneurship development in agribusiness Should be restricted only to large scale agribusiness women.	4(3.33)	16(13.33)	10(8.33)	40(16.67)	50(41.67)	2.00
Entrepreneurship development in agribusiness Sector enhances agribusiness output sustainability.	16(13.33)	50(41.67)	24(20.00)	23(19.17)	7(5.83)	3.37*
Involvement of women in entrepreneurship development in agribusiness sector increases government popularity with women in agribusiness.	10(8.33)	40(33.33)	15(12.5)	50(41.67)	5(4.17)	3.00*
Entrepreneurship development in agribusiness sector enhances idea generation among women and helps them create their own jobs.	14(11.67)	64(53.33)	12(10.00)	20(16.67)	10(8.33)	3.43*
Involvement of women in entrepreneurship development projects in agribusiness sector is just for political reasons.	10(8.33)	20(16.67)	25(20.83)	15(12.5)	50(41.67)	2.38
Entrepreneurship development in agribusiness sector enhances women's access to market and credit facilities.	30(25.00)	45(37.5)	20(16.67)	15(12.5)	10(8.33)	3.58*
Entrepreneurship development in agribusiness sector enhances capacity building among women.	40(33.33)	43(35.83)	22(18.33)	15(12.50)	0(0.0)	3.9*
One do not need entrepreneurial skill to perform better in agribusiness as the traditional knowledge would always surface.	0	20(16.67)	18(15.00)	38(31.67)	44(36.67)	2.11
Overall mean						3.35
Number of respondents						120

Source: Field survey data, 2014 .N/B: Figures in parentheses are percentages.

Table 2 showed that the majority of the respondents expressed positive attitude towards entrepreneurship development in agribusiness sector by accepting ten (10) statements out of thirteen (13) statements bordering on women attitude towards entrepreneurship development in agribusiness sector. These findings showed that majority of the women in the study area have strong positive attitude towards entrepreneurship development in agribusiness sector. In this study, specific issues which elicited the most favourable attitude from the women include "entrepreneurship development in agribusiness leads to increase in sales of agribusiness products among women with entrepreneurial skill", "entrepreneurship development skills in agribusiness sector increases the profit level of agribusiness women in the study area", "participation in entrepreneurship development programmes is necessary to achieve increased agribusiness productivity and income among women", "entrepreneurship development in agribusiness sector increase the profit level of agribusiness women", "entrepreneurship development in agribusiness sector enhances capacity building among women in the study area", and that " participating in EDP's is a prerequisite to effective agribusiness development." These indicate that women in the study area understands the importance of entrepreneurship development in agribusiness sector as one of the surest means of increasing creativity, idea generation and entrepreneurial skills that would give them the ability and increase their willingness to initiate and sustain appropriate actions towards the actualization of business objectives.

This would make the women in the study area to become more relevant and responsive to employment generations and economic development needs and therefore, able to cater for themselves, their household and the nation at large. By having a strong positive attitude towards entrepreneurship development in agribusiness sector, as shown by the overall mean score of (x= 3.35), women in agribusiness sector in the study area would become more innovative and to think and act in an entrepreneurial way. This is vital in other to sustain the growth and relevance of the agribusiness sector.

Level of Participation of Women in Entrepreneurship Development programmes(EDP'S) And its Impact on Agribusiness Practices And Productivity.

The results of the distribution of the respondents based on level of participation and level of impact of participation in EDP's on agribusiness practices and productivity are presented in tables 3 and 4 respectively;

Level of Participation Of Women In Entrepreneurship Development Programmes

Distribution of the respondents based on level of participation in EDP's.

Table 3. Level of participation of women In entrepreneurship development projects

Level of participation	Frequency	Percentage
Low level of participation	70	58.33
High level of participation	50	41.67
Total	120	100

Source: Field survey data, 2014 .

Table 3 showed that majority (58.33%) of the women in the study area recorded low level of participation in EDP'S in agribusiness sector while fewer (41.67%) of the women recorded high level of participation in EDP's.

This implies that majority of the women do not participate in EDP's .This would impact negatively on the entrepreneurial skills and innovativeness of women especially for those in the agribusiness sector. Apart from offering women the ability to identify new business opportunities in agribusiness sector and harnessing the necessary resources to be used in the new business opportunities identified, the use of EDP's in agribusiness sector as one of the means of empowering women to be more envolved in the economic development of the study area.

Table 4. Level of impact of participation in entrepreneurship development programmes on agribusiness practices and productivity

Level of impact	Frequency	Percentage
High improvement	44	88.0
Low improvement	5	10.00
No improvement	1	2.00
Total	50	100.0

Source: Field survey data, 2014.

Table 4. showed that majority (88%) of the women who participated in entrepreneurship development programmes in agribusiness sector in the study area recorded high improvement in their agribusiness practices and productivity, while only (10%) of them recorded low improvement. However, fewest (2%) of the women who participated in one form of entrepreneurship development programmes or another did not record any significant improvement in their agribusiness activities and productivity. This implies that participation in entrepreneurship development programmes in agribusiness sector by women impacted highly on their agribusiness practices and productivity. An increase in agribusiness productivity would translate into higher income for the women in agribusiness sector.

Socio economic factors influencing the involvement of women in entrepreneurship development in agribusiness sector. The result of the probit regression model analysis determining the socio economic factors that influenced the level of involvement of women in entrepreneurship development in agribusiness sector is presented below.

Table 5. Probit model estimates of socio economic factors influencing the level of involvement of women in entrepreneurship development in agribusiness sector

Variables	Coefficient	Standard error of mean	t-value
Intercept	1.1411	0.3383	3.373***
Age of respondents	-0.3619	0.1640	-2.206**
Level of Education	-0.2188	0.6880	-0.318
Experience	0.1430	0.5069	0.282
Access to loan	0.2680	0.0996	2.690**
Marital status	-0.0030	0.0020	-1.414
Governmental support	0.0410	0.0140	2.991***
Innovative use	0.0860	0.0540	1.584
Household size	0.5011	0.0761	6.621***
Information sources	0.0190	0.0280	0.667
Income	0.2810	0.0740	3.793***
Attitude	0.2399	0.1097	2.188**
Transport cost	-0.2375	0.0735	-3.230***
Effectiveness of EDA	0.2710	0.0990	2.726***
Chi-square	1406.023***		
Df	96		

Source: Field survey, 2014
*Coefficient is statistically significant at 10% level of significant
** Coefficientis statistically significant at 5% level of significant
*** Coefficient is statistically significant at 1% level of significant

The result in Table 5. showed a chi-square value of 1406.023 which is significant at 1% level, showing goodness-of-fit of the model for the analysis. Age of respondents, access to loan, government support, household size, income level of the respondents, attitude of the respondents towards entrepreneurship development in agribusiness sector and constraints to participation in entrepreneurship development in agribusiness were the significant socio-economic factors that influenced women participation in entrepreneurship development in agribusiness sector.

Age of respondents was significant and negatively related to level of involvement of women in entrepreneurship development in agribusiness sector at 5% level of significant. This implies that increase in the age of the respondents leads to no involvement of women in entrepreneurship development in agribusiness sector. Increase in age reduced the ability of women to do manual work effectively and at a long time. Therefore, the involvement of women in entrepreneurship development in agribusiness sector reduces with increase in age of the respondents.

Access to loan was positively related to women involvement in entrepreneurship development in agribusiness sector at 5% level of significance. This implies that involvement of women in entrepreneurship development in agribusiness sector increases as they have increased access to loan. Access to loan will enable women to purchase better production, processing and distribution inputs they required in their agribusiness activities as well as adopt better technologies that would increase their productivity and output.

Government support of women in entrepreneurship development in agribusiness sector was positively related to the level of involvement of women in entrepreneurship development in agribusiness sector at 1% level of significance. This implies that continuous support of women in entrepreneurship development in agribusiness sector by government increases the level of involvement of women in entrepreneurship development in agribusiness.

Household size of the respondents was positively related to level of involvement of women in entrepreneurship development in agribusiness sector at 1% level of significance. This implies that level of involvement of women in entrepreneurship development in agribusiness increased with increase in household size. Increase in the number of people living in a household increases the pressure on women to cater for such a large family size and as such, would involve more in entrepreneurship development in agribusiness sector.

Income level of the respondents was positively related to the level of involvement of women in entrepreneurship development in agribusiness sector at 1% level of significance. This implies that the level of involvement of women in entrepreneurship development in agribusiness sector increased with increase in the income level of the respondents.

Attitude of the women in entrepreneurship development in agribusiness sector was positively related to the level of involvement of women in entrepreneurship development in agribusiness sector at 5% level of significance. This implies that the level of involvement of women in entrepreneurship development in agribusiness sector increased with the women having a positive attitude towards entrepreneurship development in agribusiness sector and vice versa.

Constraints to participation in entrepreneurship development in agribusiness sector was negatively related to the level of involvement of women in entrepreneurship development in agribusiness sector at 1% level of significance. This implies that the involvement of women in entrepreneurship development in agribusiness sector increases with decrease in those factors that constrained women participation in entrepreneurship development in agribusiness sector.

Effectiveness of entrepreneurship development in agribusiness sector was positively related to the level of women in entrepreneurship development in agribusiness sector at 1% level of significance. This implies that the level of involvement of women in entrepreneurship development in agribusiness sector increased with increase in the effectiveness of entrepreneurship development in agribusiness sector as perceived by the women.

Constraints to women in entrepreneurship development in agribusiness sector. The distribution of the constraints faced by the respondents in entrepreneurship development in agribusiness sector is presented in Table 6. The most severe constraints faced by women in entrepreneurship development in agribusiness sector are lack of resources (83.33%), poor government policies on the development of women entrepreneurship in agribusiness sector (75.00%), ineffectiveness of the better life for rural women programmes (66.67%), lack of access to credit facilities (62.5%), cultural indifference (58.33%), lack of awareness of the existence of agribusiness entrepreneurship development programmes (54.17%), lack of access to market facilities (50.00%) and lack of technical knowledge (50.00%). These are essential support services needed by existing and new entrants to agribusiness sector in the study area.

Table 6. Distribution of the constraints faced by the respondents in entrepreneurship development in agribusiness sector

Constraints	**High**	**Moderate**	**Low**
Lack of awareness of the existence of such entrepreneurship development progreammes in agribusiness sector.	65 (54.17)	30 (25.00)	25 (20.83)
Lack of access to credit facilities	75 (62.50)	45 (37.50)	0 (0.0)
Lack of access of market facilities	60 (50.00)	40 (33.33)	20 (16.67)
Cultural indifference	70 (58.33)	0 (0.0)	50 (41.67)
Poor government policies on development of women entrepreneurship in agribusiness	90 (75.00)	20 (16.67)	10 (8.33)
Ineffectiveness of the better life for rural women programme (BLRWP)	80 (66.67)	30 (25.00)	10 (8.33)
Lack of resources	100 (83.33)	15 (12.5)	5 (4.17)
Lack of technical knowledge	60 (50.00)	40 (33.33)	20 (16.67)
Poor level of education to cope with the technical skills required by the programmes	20 (16.67)	70 (58.33)	30 (25.00)
Undue competition from large and established agribusiness units	13 (10.83)	73 (60.83)	15 (12.5)
Lack of interest to any entrepreneurship development progreammes in agribusiness sector.	40 (33.33)	60 (50.00)	20 (16.67)

Source**:** Field Survey data, 2014. N/B: Figures in parentheses are percentages.

CONCLUSIONS

Women feel powerless to change their lives; entrepreneurship in agribusiness represents a strong, vibrant and viable economic alternative. It is therefore concluded that, women entrepreneurs in agribusiness should be encouraged to create their own jobs and become self-employed since the opportunities of getting employment in either government or in private organization is currently almost declining. This is possible only if barriers of women entrepreneurs are solved.Thus, Efforts of both government and non-governmental agencies is required in making information on entrepreneurship development and participation in agribusiness sector to get to the entire women agribusiness entrepreneurs through various means that is complimentary with the level of education of the women as this will increase the number of women that will participate in the programmes and become self-employed.

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FACTORS AFFECTING CASSAVA FARMERS' DEMAND AND PARTICIPATION IN CREDIT MARKET: STUDY OF BENDE LOCAL GOVERNNMENT AREA OF ABIA STATE, NIGERIA

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Abstract

The study was conducted to ascertain the factors affecting participation of cassava farmers in credit market (study of Bende local government area) Abia State. The broad objective was to determine factors that affect cassava farmer's participation in credit market. The data were collected from cassava farmers of the sampled area through a well-structured questionnaire.. In this study, the Multinomial logit model was used to determine the factors that affect cassava farmer's participation in credit market, be it formal, informal, or both institutions. Socio-economic and enterprise characteristics such as sex, age, household size, training and cooperative membership were found to be significant factors that affect farmers demand and participation in credit market (i.e informal, formal and both informal and formal sources in the study area). Farmers should be encouraged to participate in both credit markets via easy access to credits from formal and informal lenders which will significantly improve productivity and welfare of cassava farmers.

Key words: *cassava, demand, credit market, participation, Nigeria*

INTRODUCTION

Credit is described as an input used in production as well as a facilitator of the efficiency of other production input. The realization of this, have necessitated government efforts at providing credit facilities through financial intermediaries like commercial banks to ensure access to credit by farm and non-farm small holder.

In an economy whose credit market is characterized by segmentation and with borrowers' inability to keep loaning terms and agreement may lead to credit rationing. Also, access to financial services by smallholders is normally seen as one of the constraints limiting their benefit from credit facilities. However, in most cases the access problem, especially among formal financial institutions is one created by the institutions mainly through their lending policies. This is displayed in the form of prescribed minimum loan amounts, complicated application procedures and restrictions on credit for specific purposes [7]. Credit enhances productivity and promotes standard of living by breaking vicious cycle of poverty of small scale farmers. [2], described agricultural credit as the process of obtaining control over the use of money, goods and services in the present in exchange for a promise to repay at a future date. The crucial role of credit in cassava production can also be appraised from the perspective of the quantity of problems emanating from the lack of it. In modern farming business in Nigeria, provision of agricultural credit is not enough but efficient use of such credit has become an important factor in order to increase productivity. Credit has also been discovered to be a major factor on the intensification of both large and small scale farming [5]. The absence of rural banks or their unwillingness to meet credit need of rural farmers largely account for the wide influence of informal lending institutions on agricultural production in the rural areas. [1] reported that non-institutional creditors accounts for 70% of the total credits received by Nigerian farming population. However, with the present situation in Nigeria, these sources could hardly meet the increasing demand for credit by farmers. Also according to [8], micro credits are used for two purposes, which are for investment and generation of wealth or for consumption smoothing. In other words credit for small and medium enterprise (SMEs) can be put into production use or consumption use. For the purpose of this work, credit for productive use which appears to be more documented will be given more attention.

The emergence of demand for short-term credit especially among traders and farmers will most likely lead to the development of an informal unit to meet that demand, [3]. In other words, the inability of the formal credit sources to satisfy existing credit demand gave greater prominence to informal institutions that could meet the demand of short term credit that small and micro entrepreneurs usually need to enhance their production efficiencies. Interestingly, most of the small and micro entrepreneurs and especially the agro-allied ones are rural-based with low level of education and poor access to useful information. This information has caused increased poverty level among the rural poor, instead of sustainable development for this vulnerable group of people. The need therefore to investigate the institutions lending policy, access to credit facilities and how it affects significantly or otherwise, the production efficiencies of small and micro enterprise becomes pertinent. Again one needs to wonder why some participants prefer one credit source to another (i.e. formal or informal). The [4] reports that in Nigeria, the formal financial system provides services to about 35% of the economically active population while the remaining 65% are excluded from access and often served by the informal financial sector, through the Non-Governmental Organization (NGO), micro finance institution, money lenders, friends, relatives and credit unions. This level of service disparity between the two sources of credit to meet credit needs of small and medium enterprise may have underlined the importance of need oriented financial system for rural development and by implication economic development. This work is designed to investigate the factors that affect the demand for credit in the credit market and the lending policies of formal and informal credit institutions, in a view to understanding its link with credit access and productivity of small and medium enterprise, specified in this study as cassava production in Bende Local Government.

The aim of the research presented in this article is to evaluate the factors affecting the demand and participation by cassava farmers in credit market. The study looked at how this credit markets can affect the demand and participation of cassava farmers either in a positive or negative way.

MATERIALS AND METHODS

Study Area. The study was conducted in Bende Local Government Area in Abia State; Nigeria. Bende is under Ohafia agricultural zone which is one of the three agricultural zones in Abia State. Bende local Government is made up five communities - Uzuakoli, Mkpa, Igbere, Akoli and Lodu. They are predominantly farmers.

Sampling procedures and techniques. Simple random technique was used in carrying out the research work. Particularly, data was collected from respondent in five communities viz Uzuakoli, Mkpa, Igbere, Akoli and Lodu through a random sampling process. The study employed multi- stage sampling techniques. In stage one; it involves purposive selection of Ohafia Agricultural zone in Abia State, in which we have Arochukwu Local Government, Bende Local Government, and Ohafia Local Government. Bende Local Government area was chosen for the study, because of its predominance of cassava farmers in the area. The second stage involved a random selection of 100 cassava farmers, which was gotten from 5 communities that make-up Bende Local Government Area. (i.e. 20 farmers from each community) Uzuakoli (20), Lodu (20), Mkpa (20), Igbere (20) and Akoli (20).

Data Collection and Procedures. The data for this research study were obtained mainly from primary source through field survey using a well-structured questionnaire based on the objective of the study. Data were collected from each of the farmers in each of the five communities based on their socio-economic characteristics and their enterprise characteristics.

Model specification. Multinomial logit model are used for model relationships between a polychotomons response variable and a set of variables. This model is based on the random utility model [6]. The utility to a farmer is a linear function of factors characterized into socio–economic characteristics, enterprise characteristics, credit status and institutional factors. The essence is to ascertain the relative choice between formal and informal institutions or both by farmers.

Thus, U (alternative 0) $=\beta jXo+ e^i$,U (alternative 1) $=\beta jXo+ e^j$,U (alternative 2) $=\beta jXo+ e^k$.

The probability of a participant choosing an alternative is capital to the probability that the utility of that particular alternative is greater than the choice set that is given (0 dependent variable) = choice 1, if U(alternative 1)) > U (alternative2),

Where $1\neq2$, then $B_1X_1+ e_j> B_2X_2+ e_k$.

$Poi= a_0+\beta_0X^iP_0i= a_1+\beta_1X^iP_1i= a_2+\beta_2X^iP_2i= a_3+\beta_3X^iP_3i$, Where $P_{0,}$ $P_{1,}P_2$ and P_3= probability of no credit, formal credit, informal credit or both formal and informal credit respectively. Thus, Poi= Probability that individual i will demand no credit, P_1i= Probability that individual i will demand from formal sources, P_2i= Probability that individual i will demand from informal sources, P_3i= Probability that individual i will demand from both formal and informal sources, Xi = Value of X for the ith individual (independent variables) ,a = Intercept, β= Coefficient. In addition the, objective of using the multinomial model will be to test the relationship between the probabilities of determining factors and to use the estimated coefficient to generate the probabilities of the respondents falling into one of the credit markets.

The variables which affect farmer's participation are determined quantitatively in a model implicitly specified as the follows:

$Y = (X_1,X_2,X_3,X_4,X_5,X_6,X_7,X_8,X_9,X_{10},X_{11},X_{12},X_{13},X_{14},X_{15},X_{16},e_1)$…..(1)

Where Y = credit source measured as a polychotomous variable with values reflecting farmers credit status. It takes the values of 0, 1, 2 and 3 for cases where a farmer did not obtain credit at all; obtain credit from formal institution, informal institutions, or both formal and informal institutions respectively.

X_1= Sex (male = 1, female = 0)
X_2= Educational level (above primary school = 1, otherwise = 0)
X_3= Household size (numbers)
X_4= Farming experience (years)
X_5= House hold asset (₦)
X_6= Farm size (hectares)
X_7 = Distance from lending institution to farm (km)
X_8 = Output (₦)
X_9 = Outstanding loans (Yes = 1, No = 0)
X_{10} = Deprived of loans (Yes = 1, No = 0)
X_{11} = Membership of cooperative association (Yes = 1, No = 0)
X_{12} = Cassava training (Yes = 1, No =0)
X_{13} = Easier formalities (Yes = 1, No = 0)
X_{14} = Flexible payback (Yes = 1, No = 0)
X_{15} = Interest rate charged (Yes = 1, No = 0)
X_{16} = More favorable terms (Yes = 1, No = 0)
e_1 = error term

RESULTS AND DISCUSSIONS

The result of the multi logit model is given in Table 1. The coefficients of the probabilities of the informal and formal were estimated with respect to no credit demand. A positive coefficient shows that the probability of a respondent falling in the numerator category is greater than the probability of falling in the denominator category. A negative coefficient gives the opposite.

Formal Sources. In the model, four variables were found to have significantly affected the demand for formal credit. These include farm size, outstanding loan, training and co-operative.

Farm size was significant at 10% and positively related. The positive sign means larger farm size, attracts higher demand for credit in formal sources. It further means that farm size is statistically affecting credit demand.

Outstanding loan was statistically significant at 1%. This reveals that the outstanding loan of the respondent significantly affects the credit demand from formal sources. It further shows by its positive sign that there is higher probability of demanding for credit from formal sources by farmers with outstanding loans than not to demand at all, notwithstanding their inability to clear the old debt, because they belong to cooperatives, which creates easy access to credit.

Table 1. Multinomial logit model result

Independent Variables	Dependent Variable		
	$\frac{P1}{P0}$	$\frac{P2}{P0}$	$\frac{P3}{P0}$
Constant	877.957 (1.490)***	-16.232 (1.928)	-1.195 (2.736)
Sex	-0.884 (0.472)	-1.101 (0.505)	2.190 (0.626)**
Age	0.129 (0.020)	0.175 (0.024)	-1.287 (1.313)
Education	0.066 (0.023)	0.20 (0.25)	0.121 (0.067)
Household size	0.548 (0.135)	1.516 (0.159)	-12.821 (29.819)***
Experience	0.231 (0.060)	0.415 (0.069)	0.188 (0.066)
Household asset	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Farm size	1.723 (0.303)*	-1.124 (0.311)	0.053 (0.030)
Distance	-0.494 (0.156)	-1.168 (0.198)	0.644 (0.215)
Outstanding loan	4.009 (0.665)***	2.411 (0.624)**	68.097 (100.923)***
Output	0.000 (0.000)	0.000 (0.000)	1.542 (0.183)
Training	20.489 (10.000)***	3.664 (0.788)***	1.487 (0.715)
Cooperative	1.652 (0.421)*	1.004 (0.489)	1.248 (0.570)
Easier formalities	0.273 (0.500)	1.067 (0.464)	-638.757 (566.754)***

Source: Field Survey (2013)

Note: ***, ** and * significant at 1%, 5% and 10% respectively.

Log likelihood: 608.555 LR Chi2 = 1152.962 df : 39

Training was positively related, and statistically significant at 1%. The implication is that respondents who had one or more trainings will most likely demand for credit. It further reveals that training is one of the determining factors of credit in formal sources.

Cooperative significantly affects the demand for credit at 10% and positively. This implies that the possibility of demanding for credit is easier for those that belong to cooperatives. It is a priori expected since membership of cooperative makes for easy access to credit especially from formal sources.

Informal Sources. From the result in the model, for demand from informal source, only two variables were statistically significant at 5% and 1% levels respectively. They are outstanding loans and training.

Outstanding loan was significant at 5% and positively related. The implication is that outstanding loan affects the demand for credit from informal sources. The positive sign indicates that a farmer with outstanding loan has higher probability of demanding for credit from informal sources, than not to demand at all.

Training was statistically significant at 1% and positively related in the informal sources. This implies that training is the determining factor that affects farmers demand for credit in the informal source. The positive sign implies that farmers, who had one form of training, will most, likely demand for credit.

Both Formal and Informal Sources. In the model, four variables were found to have significantly affected credit demand in both formal and informal sources. These include sex, household size, outstanding loan and easier formalities.

Sex was statistically significant at 1%. The implication is that sex significantly affects the respondents demand for credit in both formal and informal sources. The negative sign of the coefficient reveals that the probability for male demand for credit is low, than the female.

Household size was significant at 10% and positively related. This implies that household size of the respondent in both formal and informal sources affect the demand for credit. The positive coefficient shows that respondents with larger household size have greater probability for credit demand in both sources.

Outstanding loan was statistically significant at 1%. This reveals that the outstanding loan of the respondent significantly affects the credit demand from both formal and informal sources. It further shows by its positive sign that there is higher probability of demanding credit from both formal and informal sources by farmers. Institutional factor like easier to get a credit was statistically significant in all three markets.

Easier formalities were found to be significant at 1% and negatively affect credit demand and participation in both formal and informal sources. The implication is that easier formalities from lending sources is a determining factor in obtaining credit from both formal and informal sources.

In summary, three categories of credit markets were identified. These include the formal institution, informal institution and both formal and informal institutions. The coefficient of the probabilities of the formal, informal and both formal and informal institutions were estimated with respect to no credit demand (i.e. the probability that the farmer did not demand at all).

CONCLUSIONS

According to the data analyzed, sex, age, household size, outstanding loan, training and cooperative membership were found to be significant factors that affect farmers demand for credit, from informal, formal and both informal and formal sources in the study area. The positive sign associated with them indicates that, as they increase, there probability of demand for credit will also increase, vice versa.

Against this background and from the results of the research, the following policy recommendations were made:

Credit institutions should give due consideration to policy conditions as more favorable terms and interest rate during policy formulation in such a way that it will be easier to get a loan while maintaining mutual benefit between farmers and the institutions.

Farmers should be encouraged to create social capital through their membership of association relevant to their businesses. The business progress of one member could encourage others to participate and thus improve productivity and welfare.

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THE WASTE RECYCLING IN ROMANIA

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Abstract

The paper approached an actual subject, "Waste recycling in Romania", an important topic in terms of increased quality of life, so superficially treated for methodological and procedural aspects. Essentially, the mismanagement of waste is an important cause concerning the pollution of environment and threats to human health, and at the same time it reflects the inefficient way of the usage of natural resources. One of the greatest risks for people is represented by ineffective and irresponsible collection and recycling of solid waste which pollutes the environment. The waste management technologies like land filling and incineration do not represent a complete solution for solving the existing problems. The organizations should continuously improve the manufacturing and using of waste. Additionally, in order to protect the environment it is necessary to eliminate waste or to transform waste into useful products. At the same time, it may be required to review the identification of waste. The framework regarding waste elimination contains three consecutive phases: waste documentation, waste analysis, and waste removal. In this paper, waste elimination is the main approached aspect to ensure that the manufacturing sector progresses towards efficient production processes and a hazard-free workplace environment.

Key words: environmental issues, pollution, waste, waste management, waste recycling, waste recycling within the European Directive

INTRODUCTION

It is now a common place to say that today's lifestyle generates constant current problems including environmental incidents mostly due to the large amount of packages that are to be recycled. It should be noted from the beginning that wastes, containing a significant proportion of materials and raw materials that can be reintroduced and recycled into the economic circuit and thus used in various manufacturing processes. Additionally, it should be noted that a significant share of the whole quantity of waste is represented by non-biodegradable materials (plastic, glass, metal, etc.) that were considered by European legislation as agents of soil pollution and contaminants that are to be eliminated. "*Everyday waste consists of 45% food waste, 24% plastic, 7% paper and 6% iron. Approximately 95-97% of waste collected is taken to landfill for disposals. Wastes which Remain are sent to small incineration plants, or diverted to recyclers/re-processors or is dumped illegally. Actually, only 5% of waste is recycled, however the government aims to reach a ceiling of 22% in terms of waste recycled by 2020*". (Malaysia Environment-Current issues-Geography, 2010) [13].

Recent studies show that "*our earth suffers from many environmental problems which need to be addressed and tackled at an individual level, requiring individuals to develop those attitudes which will guide them to environmentally supportive behaviour*". (Ahmed & Mohammed Al-Mekhlafi, 2009) [1]. Given these considerations briefly established, we intend to describe the approach to waste management aiming at developing strategies/actions and to improving environmental systems in the urban areas.

The good practice we teach is that the best strategy for guaranteeing high standards of waste is to separate at collection in new developments and restoration areas e.g. "*at door-to-door waste collection"*.

The applicable regulations in the construction it can be identified and recognized that the criteria for dimensioning the space to be reserved for waste collection, both at the apartment and at the block and urban sites.

In all countries is necessary for a solid waste management protocol for the proper valuation of waste such as the discovery of specialized researchers indicating that "reliable waste management data provides an all-inclusive resource for a comprehensive, critical and informative evaluation of waste management options in all waste management programmes" *(Chang and Davila, 2008). "Unfortunately, these required fundamental statistics are lacking in many developing countries"* (Buenrostro et al., 2001) [3] and where available, *"they are inconsistent due to the fact that they come from many sources in which cannot be validated and are sometimes based on assumptions and not specific and scientific measurements"*. (Couth and Trois, 2011, IPCC, 2006 and Ranjith, 2012) [7, 12, 17].

The current classification of waste is realized via the legislative framework to specific industries and indicates the desirability scale in waste management from a feature perspective. *"EU Waste Framework Directive defines the different types of waste processing and provides a view to desirability of the different strategies along with definitions of their meaning for industry"*. (Conroy et al., 2006, Council directive, 2008/98 and Pickering, 2006) [5, 6, 16].

It additionally shows that *"current waste management practices in relation to composites are dominated by landfillin"* (WRAP, 2013) [19],*"which still is a relatively inexpensive option for industry in comparison to alternatives. However, it is the least preferred option according to legislation"* (Council Directive 2008/98/EC) [5].

Moreover, exists the specialist views that *"it has also been recognised that landfilling will become unviable for industries mainly due to legislation-driven cost of disposal increase"* (Pickering, 2006) [16]. From another perspective, "*from 1998 the standard landfilling rate has increased from £7 per tonne to £64 per tonne in 2012 on average increasing £4 annually. From 2013 that annual increase has risen to £8, making the 2014 landfilling rate to be £80/tonne and in 2015 it is declared to be 82,60/tonne"* (HM Revenue and Customs, 2015) [11].

Although, the management of waste recycling continues to improve in the EU, the European economy still loses a significant amount of potential *"secondary raw materials"* (metals, wood, glass, paper, plastics). Total waste production in the EU, in 2010 amounted to 2.5 billion tons. From this total only a limited share (36%) was recycled, with the rest landfilled or burned, of which could be some 600 million tons recycled or reused.

Regarding waste it was established that *"each person in Europe is currently producing, on average, half of tonne of such waste. Only 40 % of it is reused or recycled and in some countries more than 80% still goes to landfill"*. (Environmental Data Centre on Waste, Eurostat) [8].

An effective waste management programme would result in an improved quality of life, reducing the negative impact on human health and the environment, reducing emissions of greenhouse gases (directly by reducing emissions from landfills and indirectly through materials that would otherwise be extracted and processed for recycling), as well as a significant reduction in the damage to the natural environment.

Recently, introduced in the literature that an interesting definition defines "*recycling as the practice of sorting out, collecting, remanufacturing or converting of waste products into new materials. The process involves a series of steps to produce new products. Waste recycling plays vital roles such as reducing the utilization of raw materials, energy convention and air pollution"*. (Moore, 2008) [14].

Moreover, it is a key constituent of modern waste reduction. Researchers affirm that "*waste recycling helps in extending the life and usefulness of products that have served their initial purpose by producing numerous items that are useable"* (Baud, Johan, & Furedy, 2004) [2].

Nowadays, the main concern of policy makers regarding the issue of waste (biodegradable waste) is represents by the production of methane from such waste decomposing in landfills, which accounted for some 3% of total greenhouse gas emissions in the EU-15 in 1995. The Landfill Directive (1999/31/EC) obliges Member States to reduce the amount of biodegradable municipal waste that they landfill to 35% of 1995 levels by 2016 (for some countries by 2020) which will significantly reduce this case.

MATERIALS AND METHODS

The purpose of this research is waste elimination as the manufacturing sector to progress towards efficient production processes and a hazard-free workplace environment.

It is based on literature in the field and the ideas belong the authors who synthesized the main aspects in a critical manner.

RESULTS AND DISCUSSIONS

(1)The management of environmental issues

From an economic point of view, recycling is more attractive than the production of primary resources, also due to the allocation of costs and the negligence of external costs of materials production and waste management. But, when low-cost mass production techniques reduced the costs of materials and products since the industrial revolution, you see a decreasing attention for recycling, as it became economically less attractive.

This article presents the role of recycling in full change as part of waste management, beginning with experts in the field followed by concepts in relation to recycling as a significant key and an integral part of modern waste management.

Waste goes through specific processes from collection to recycling or disposal. Thus, *"together they make up the overall waste treated in the European Union (at 4.6 tonnes per capita in 2012)"* (European Union, 2015). Waste streams can be divided into two broad types: streams made of materials (such as metals or plastics) or streams made of certain products (for example electronic waste or end-of-life vehicles) which require specific treatment and ultimately feed into materials-related streams. Reports suggest that the new legislative proposal on waste to be tabled by the European Commission by the end of 2015, as part of the new "circular economy" package, is likely to focus on individual materials. Each waste stream has its specific characteristics and applicable legislation, including in terms of treatment method, hazardousness, practical recovery and recycling possibilities. Broadly, a set of general principles apply across waste streams. Waste streams can be divided into two main categories: material-related streams (including metals; glass; paper and cardboard; plastics; wood; rubber; textiles; bio-waste) and product-related streams (including packaging; electronic waste; batteries and accumulators; end-of-life vehicles; mining, construction and demolition waste). A number of aspects need to be considered in assessing different waste streams: sources of waste to be treated and uses of treated waste; applicable recycling and recovery methods; specific opportunities and challenges, in particular related to recycling; and applicable European Union legislation and its implementation. Therewith, the negative effects on the environment are made through the using and processing of raw materials.

However, some technologies can contribute to reducing negative effects on the environment additionally they also have a positive economical effect. For example, one of these processes is to recycle waste. The process for conversion of materials into new products to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, energy usage, air pollution and water pollution by reducing the need for "conventional" waste disposal is ***recycling***.

However, recycling of waste quantities can be considered a process with multiple beneficial effects that reduces their accumulation in landfills, resulting in a space which can be used for purposes beneficial to the environment. The countries from Europe are dependent on imports of raw materials that is precisely why, recycling provides alternatives for EU industries which can be used for various types of waste, such as glass, paper, plastic and metals, as well as precious metals from used electronic appliances. Since there exists a European legislative framework in the field of recycling of waste, it may indicate that they are intended to ensure that waste is used as raw material for making other new products. Recycling promotes energy saving in which transforms the recycling of a material of aluminium which saves approximate 95% of energy needed to produce a new product from raw materials.

A.European Directives on Waste Management

a. Waste Framework Directive 2008/98/EC sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. It explains when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products. The Directive lays down some basic waste management principles: it requires that waste be managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours, and without adversely affecting the countryside or places of special interest. The main features of waste management that must be taken into account, figure 1: (i) *waste prevention*, by application of “clean technologies” in waste generating activities; (ii) *reduction of waste quantities*, by implementing best practices in every day waste generating activity; (iii) *valorification*, by reuse, material recycling and energy recovery; (iv) *disposal*, by incineration and landfill.

This Directive introduces the "***polluter pays principle"*** and the ***"extended producer responsibility***". It incorporates provisions on hazardous waste and waste oils (old Directives on hazardous waste and waste oils being repealed with the effect from 12 December 2010), and includes two new recycling and recovery targets to be achieved by 2020: 50%.

Preparing for re-use and recycling of certain waste materials from households and other origins similar to households, and 70% preparing for re-use, recycling and other recovery of construction and demolition waste.

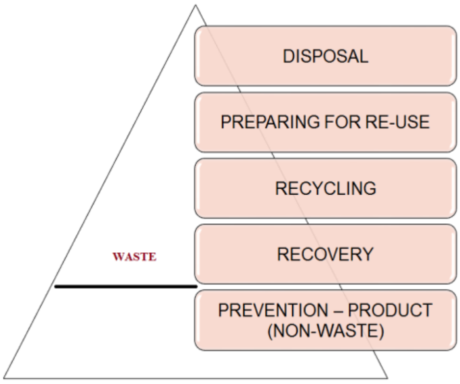


Fig. 1. Waste recycling [18]

***b.Directive 2000/76/EC of the European Parliament* and of the Council of 4 December 2000 on incineration of waste** the European Union imposes strict operating conditions and technical requirements on waste incineration plants and waste co-incineration plants to prevent or reduce air, water and soil pollution caused by the incineration or co-incineration of waste. And emission limits are introduced for certain pollutants released to air or to water.

c. The Landfill Directive

Council Directive 1999/31/EC on the landfill of waste (the Landfill Directive) was agreed in Europe at Council on 26 April 1999 and came into force in the EU on 16 July 1999. The Directive aims to harmonise controls on the landfill of waste throughout the European Union, and its main focus is to achieve common standards for the design, operation, and aftercare of landfill sites. It also aims to reduce the amount of methane, a powerful greenhouse gas, emitted from landfill sites.

B.Specific responsibilities on the waste

The issue of responsibility on waste implies an inherent hierarchy from individual and family responsibilities at the institutional, legal and community. Generally speaking all have to take our responsibilities regarding waste recycling. Additionally, it is important to understand that as the quantity of waste increases, there is also an accumulation of effects, some of which are evil due to lead to pollution and decrease in comfort, others such beneficial as it creates a natural source raw materials and recyclable materials. It is also essential to have clarity regarding the action of factors acting as producers of waste. Therefore, legislation on waste management clearly imposes certain responsibilities incumbent upon the waste producer but what of processing such material. If reference is made at the Guidance about "Waste Management: The Duty of Care - A Code of Practice" can be defined for the producer such as: (i) "*the person who made the substance become waste e.g. by breaking or contaminating it*"; (ii) "*the person who decided that a substance was unwanted and therefore waste*".

(2)Waste recycling

2.1. Types of waste

The waste could be liquid or solid waste, however both of them could be hazardous for the environment. Also, these waste types can also be grouped into organic, re-usable and recyclable waste. Further, waste could be divided into the following types: (i) ***liquid waste*** can come in non-solid form and some solid waste can also be converted to a liquid waste form for disposal. It includes point source and non-point source discharges such as storm water and wastewater. For example, include wash water from homes, liquids used for cleaning in industries and waste detergents; (ii) ***solid type*** is represents through any garbage, refuse or rubbish that we make in different places. For example, old car tires, old newspapers, broken furniture and even food waste. They may include any waste that is non-liquid; (iii) **hazardous waste** potentially threaten public health or the environment, besides this waste could be ***inflammable***, ***reactive*** *(can explode)*, ***corrosive*** *(can eat through metal) or* ***toxic*** *(poisonous to human and animals)*. The law on waste from different countries must involve the competent environmental authorities to supervise disposal of hazardous waste and can be included as examples fire extinguishers, old propane tanks, pesticides, mercury-containing equipment, lamps and batteries; (iv) ***organic waste*** derived from plants or animals sources. Thus, identified waste as a food waste, fruit and vegetable peels, flower trimmings and other. Additionally, these wastes are biodegradable materials and therefore people turn their organic waste into compost and use them in their gardens.

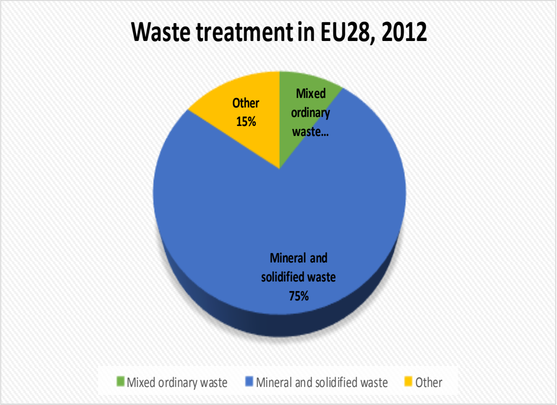


Fig. 2. Waste treatment in EU28, 2012 [9]

2.2.Importance and benefits of waste recycling

According to experts it can be stated that *"the first benefit of waste recycling is that it creates job opportunities for many people involved in the waste management process such as waste collectors"* (Baud, Johan, & Furedy, 2004) [2].

The importance of recycling is a theme that no longer needs to be demonstrated. In terms of purely economic process itself is generating profits and lead to saving natural resources. Thus, we should reuse metal items because they degrade over a long period. Recycling of materials from metal can be carried out by re-selling to specialized companies. As mentioned previously, recycling of waste papers can save our forests. Recycling is a benefit to the environment and the population thus it: (i) *Helps protect the environment via* recyclable waste materials in which would have been burned or ended up in the landfill. Pollution of the air, land, water and soil is reduced. (ii) *Conserves natural resources*, for example recycling more waste means that we do not depend too much on raw (natural) resources, which are already massively depleted. (iii) *It Saves energy*: it takes more energy to produce items with raw materials than from recycling used materials. This means we are more energy efficient and the prices of products can be significantly reduced."*This has various benefits and advantages such as more taxes and revenues* *to the city or state governments, production of affordable and durable goods, clean and healthy environment, clean water, and fresh air to breathe. To sum it up, waste recycling leads to a healthier economy for all concerned"* (Moore, 2008) [14].

Recycling requires much less energy and therefore helps to preserve natural resources.

(3)Recycling of waste in Romania

"*According to data gathered by the European Commission, 92% of this total in 2006 was deposited as before, i.e. by collecting waste in landfills. Then, the percentage began to decline from 81% in 2007 and 76% in 2008*" (EC, 2012) [9]. But "*the percentage recorded in 2009 was only 75%*" (NEPA-ANPA, 2010) [15]indicating an early rise proposed objective for 2010.

Several factors modify Romanian waste management. Increasing the amount of waste plastics simultaneously decreasing the storage of waste is the main problem. The plastic products are, in our country, growing at a rate of 15% per year.

The Ministry of Environment developed the National Waste Management Strategy, with the main purpose to create the necessary framework for the development and implementation of an environmentally and economically sound integrated waste management system.

Waste collection and recycling is a success business in Romania. Investments in equipment which are not currently encouraged only by the availability of EU funds but is, equally, a necessity given the lack of capacity to meet EU recycling by 2017. The companies invested significant amounts in waste recycling in Romania, especially in equipment, transport machines and installations.

Romania still has fixed the issues concerning waste recycling, although it is better situated than other states, Table 1.

Companies focus on the development of solutions in accordance with European legal framework in order to avoid landfills that are poorly managed and producing adverse effects on the environment.

The big companies specializing in waste recycling comply with the legislation in force and looking for ways to be efficient and environmentally friendly, so that they can be closed illegal landfills.

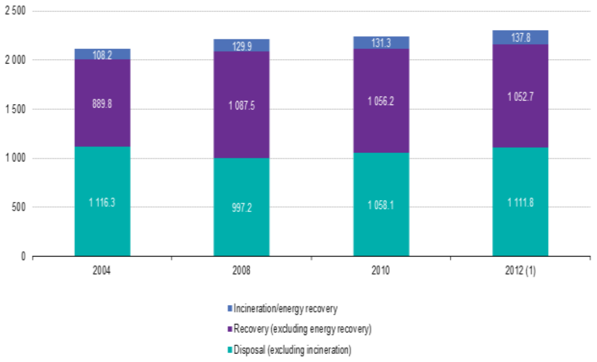
Table 1. Waste Landfilled and Incinerated

Country	**Landfilled waste (kg/capita/year)**	**Country**	**Incinerated waste (kg/capita/year)**
Germany	3	Bulgaria	0
Netherlands	14	Romania	0
Belgium	21	Poland	1
Sweden	21	Czech Republic	36
Austria	86	Hungary	38
France	185	Great Britain	53
Poland	239	Italy	67
Czech Republic	243	Belgium	162
Romania	284	Austria	180
Italy	286	Germany	192
Great Britain	324	France	194
Hungary	341	Netherlands	200
Bulgaria	388	Sweden	240

Source: Eurostat, 2009 [10]. (Online), Available at: http://epp.eurostat.ec.europa.eu

The companies hereby set up for that it takes of a better waste management and alignment to standards imposed on the amount of materials that must be recycled per capita.

In Romania, the waste has been stored in mines, industrial plants and military and therefore resulted in a significant amount of radioactive waste, chemical weapons, rocket fuel and other hazardous toxic.



(¹) Eurostat estimates.

Fig. 3. Comparing the amount of waste incinerated/ recovered / disposal
Source Eurostat, 2015, http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics

Unfortunately, besides the big cities were deposited municipal waste which not complying environmental legislation and hygiene provisions. However, our country has implemented the along during a series of reforms in determining compliance with European directives imposed by the European Union.

One can see from Fig.3, the difference between the analyzed years in Eurostat estimates 2004, 2008, 2010, 2012 and in the last year, the amount of waste was recovered and reused in industry and agriculture.

(4)**Innovative ideas regarding the waste recycling**

The *anaerobic digestion* provides an innovative and useful solution through which gases from organic waste is converted into energy. Degradation of waste material using microorganisms in a particular environment. Its use is in the treatment of organic solid waste and wastewater. The remaining material in the vessel may act as a fertilizer for plants, and biogas from energy turns.

Another innovative method for recycling a *waste to energy* is, that energy from waste is a complex method. However, this has the advantage that it can eliminate waste faster than other processes.

Organic materials can turn into a gas (carbon monoxide and hydrogen) through *gasification and plasma arc gasification*. And the resulting gas is burned to produce electricity and steam. Waste disappear completely, and the gas is converted into energy.

An innovation in European countries can be defined by The Zero Waste International Alliance as: "*Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health*".

Also, the WEEE (waste electrical and electronic equipment) is a revolutionary method in recycling, but very expensive. However, waste electrical and electronic equipment in the EU has a rapid growth. If treatment is properly applied, then it can provide significant effects on the environment and human health.

CONCLUSIONS

In conclusion, the process of recycling is essential both in terms of maintaining a healthy natural environment and for improving indicators on the quality of life and public health.

Recycling waste can be considered as the cornerstone of the entire environmental issues, including giving it some solutions on the conservation of natural resources and energy, and in terms of maintaining a healthy and unpolluted environment in all aspects.

At the same time, it can keep part of the present natural resources at our disposal to aid recycling.

In this context, Romania has recovered a large gap with the advanced European countries, both in terms of legal framework and especially, behaviours and attitudes that are to be improved and adjusted to European practice in the field.

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EFFECT OF AWARENESS OF EBOLA VIRUS DISEASE ON FOOD SECURITY STATUS AMONG BUSH MEAT MARKETERS IN IBADAN, OYO STATE, NIGERIA

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Abstract

The study investigated the effect of level of awareness of Ebola virus disease on food security status among bush meat marketers in Ibadan, Oyo state, Nigeria. The specific objectives of the study were to; describe the socio-economic characteristics of respondents, examine the extent to which the respondents are aware of Ebola virus disease prevalence, determine their food security status, identify the determinants of household food security of the respondents and lastly, the major constraints encountered by the respondents during Ebola Virus Disease outbreak in the study area. A multistage sampling technique was used to collect primary data from 100 bush meat marketers using structured questionnaire. Data collected were analyzed using descriptive and inferential statistics. The result of the study revealed that 89.0% of the respondents were female and 76.0% were married. Majority (90%) were educated and their age fall between 41 and 60 years (51.0%). Majority (54.0%) of the respondents earned ₦20,001 and ₦40,000 per month before Ebola Virus Disease outbreak and 52.0% earned between ₦20,001 and ₦30,000 after Ebola Virus Disease outbreak per month. Similarly, ranking score showed that radio (53.0%), family and friends (21.0%), television (44.2%) were major sources of information to the respondents during the outbreak of Ebola Virus Disease in the study area. majority (85.5%) of the respondents were aware of Ebola Virus Disease occurrence while only (14.5%) were not aware of Ebola Virus Disease. The mean per capita food expenditure per month was estimated to be ₦3,720.45 and the value was used to establish the food security line which shows that 52.3% of the households were food secure. The binary logit regression analysis showed that marital status, educational level and monthly income were positive and had a significant influence on food security status while age was significant but negatively influences the respondents' food security status. Major constraints faced by the respondents include low income generation as a result of phobia for the virus, which hinders the respondents from meeting their social obligations as well as discrimination of the infected person.

Key words: *Ebola virus disease, food security status, bush meat marketers, Oyo state*

INTRODUCTION

Ebola Virus outbreaks have occurred at least eight times in various African countries since 1994; five outbreaks involving eight different viral strains occurred in Gabon and Republic of Congo since 2001, with each human outbreak linked to the handling of a dead animal (gorilla, chimpanzee or duiker) [6]. Following the outbreak of the Ebola virus disease in some West African Countries, Nigeria became an affected country. In a country where planning for disease outbreaks are woefully inadequate, the country showed determination in adopting approaches that ensured that the scenario did not escalate to an epidemic level [13]. In Nigeria, there has been an unprecedented fear of Ebola virus disease (EVD or Ebola) since July 20, 2014. It's important to state that the first incidence of the outbreak was happened in Lagos, which is not far away from Ibadan [5]. As [5] further notes: "In a matter of weeks some 19 people across two states were diagnosed with the disease (with one additional person presumed to have contracted it before dying). But rather than descending into epidemic, there has not been a new case of the virus since September 5. And since September 24 the country's Ebola isolation and treatment wards have sat empty. If by Monday, October 20 there are still no new cases, Nigeria, unlike the U.S., will be declared Ebola free by the World Health Organization (WHO)". World Health Organization [15] declared Nigeria Ebola free on 20 October 2014.

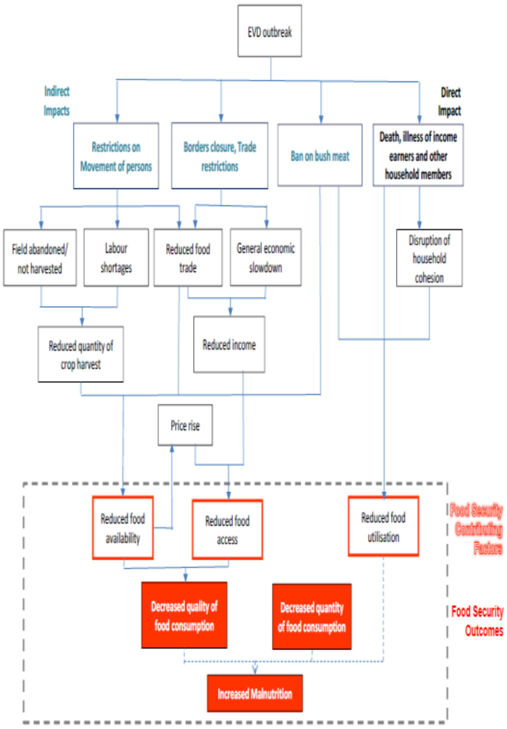
EVD outbreak
Indirect Impacts
Direct Impact
Restrictions on Movement of persons
Borders closure, Trade restrictions
Ban on bush meat
Death, illness of income earners and other household members
Field abandoned/ not harvested
Labour shortages
Reduced food trade
General economic slowdown
Disruption of household cohesion
Reduced quantity of crop harvest
Reduced income
Price rise
Reduced food availability
Reduced food access
Reduced food utilisation
Food Security Contributing Factors
Decreased quality of food consumption
Decreased quantity of food consumption
Food Security Outcomes
Increased Malnutrition

Fig. 1. Causal Chain of the impacts of the EVD outbreak on Food Security. This chart does not aim to give an exhaustive picture but rather to schematically represent the most important impact channels of the EVD outbreak on food security

The Ebola outbreak has obviously direct impacts on food security for households whose livelihood depends on bush meat marketing. If the virus has affected income earner(s), household incomes are reduced and food access is limited, thereby threatening household food security.

However, the EVD outbreak has a much wider impact on food security, linked to the effects of measures taken to limit the transmission of the virus. These measures are likely to affect food availability and access through several pathways depicted on Figure 1 [12].

As a result, many households whose livelihood depends on bush meat marketing have difficulties meeting food needs with the majority of people depending on cheaper and less nutritious food - such as cassava instead of protein (bush meat) and vegetables - but also reducing the number of meals, limiting the portion size of meals and sometimes borrowing food or money for food. Without a rebound in employment or some social protection intervention from the government they are becoming even more food insecure [12].

Research has focused on emerging zoonotic diseases as global threats, and their potential impact on global economies and high income countries, it is likely that poor populations in their countries of origin will be particularly affected due to a lower capacity to manage zoonotic diseases generally [11].

The effect of zoonotic disease emergence on cross-border trade can have dramatic impacts on local and national economies, which may in turn affect livelihoods of the poor in those countries [14]. Based on the foregoing, this research work aims at analyzing the effect of awareness of Ebola virus disease on food security status among bush meat marketers in the study area while the specific objectives were to:

(i)describe the personal characteristics of the bush meat marketers;

(ii)examine the extent to which the respondents are aware of Ebola virus disease prevalence;

(iii)determine the level of food security status of the respondents;

(iv)identify the determinants of household food security status of the respondents;

(v)examine the constraints encountered by the respondents during Ebola Virus Disease outbreak.

Statement of Hypothesis

H_01:There is no significant difference between monthly income before Ebola Virus Disease outbreak and monthly income after Ebola Virus Disease outbreak in the study area.

MATERIALS AND METHODS

The study was conducted in Ibadan, a city in south western Nigeria, capital of Oyo State, located about 110 km (about 70 miles) northeast of Lagos. Ibadan is a major transit point between the coast and areas to the north. The population of Ibadan metropolis area increased at a growth rate of 3.9 % per annum from 1952 to 1963 when the population rose to 1,258,625, then to 1,829,300 in 1999 at a growth rate of 1.65 % from 1963 [7]. The population growth is said to have shifted gradually to the lesser city with a growth rate of 4.7 % per annum between 1991 and 2006. Ibadan is the centre of trade for a farming area producing cacao, palm oil, yams, cassava, corn, and fruit. Ibadan metropolis is made up of eleven (11) LGAs consisting of five urban local governments in the city, six semi-urban local government areas in the fewer cities. The five urban local governments are Ibadan North, Ibadan North East, Ibadan North West, Ibadan South East and Ibadan South West while the six semi-urban local governments are Akinyele, Egbeda, Ido, Lagelu, Ona-Ara and Oluyole.

Primary data was used for the study. It was obtained directly from the respondents using structured questionnaire administered to the bush meat marketers. The respondents were selected from the population using multi-stage sampling technique. The first stage involves purposive sampling of four local governments. These include (Akinyele, Iddo, Ona ara and Oluyole) where bush meat marketers are concentrated. At the second stage, a random sampling selection of one (1) bush meat market from each of the four (4) Local Government Area (making four markets selected). Then, 40% of 250 bush meat marketers in the selected Local Government Area were interviewed using a snowball sampling technique to select twenty five (25) bush meat marketers from each of the selected bush meat market, having a sample size of 100 respondents for the study. Descriptive statistics, such as frequency distribution, means and percentages were used to analyze the socio economic characteristics, examine the extent to which the respondents are aware of Ebola virus disease prevalence and the major constraints encountered by the respondents during Ebola Virus Disease outbreak in the study area. Per capita household food expenditure was used to establish the food security line and the respondents were classified as food secure or food unsecure based on that. Binary Logit regression model was used to examine the determinants of household food security of the respondents in the study area.

$$FSi = \beta_0 + \beta_1X_1 + \beta_2X_2 - \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + U \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where;

FSi = Food security index (ratio): 1 = food secure and 0 = food insecure
β_0 = Constant
X_1 = Age of the household head (years)
X_2 = Gender of the household head (Male=1: Female=0).
X_3 = Marital status of the household head (Married=1: Otherwise=0).
X_4 = Household size (Number).
X_5 = Educational status of the household head (Number in years).
X_6 = Marketing experience (years)
X_7 = Monthly income (₦)
U= Error term

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of the Respondents

The table 1 shows the analysis of the socio-economic characteristics of the respondents which revealed that 51.0% of the respondents fall within the age range of 41-60 years, indicating that a typical bush meat seller interviewed was in their economically active age. 89.0% of the respondents were females and most (76.0%) of them were married respondents. The average household size was 8. Meanwhile, distribution of respondents by education revealed that majority of them had one form of education or the other (90.0%). Majority (54.0%) of the respondents earned ₦20,001 and ₦40,000 per month before Ebola Virus Disease outbreak and 52.0% earned between ₦20,001 and ₦30,000 after Ebola Virus Disease outbreak per month. An appreciable proportion (92.5%) had bush meat marketing as their primary occupation while (46.7%) of the respondents indicated that trading was their secondary occupation.

Table 1. Descriptive statistics of bush meat marketers in the study area (n=100)

Socio economic characteristics	Frequency	Percentage (%)
Age of respondents (Years)		
21-40	42	42.0
41-60	51	51.0
>61	7	7.0
Gender of respondents		
Male	11	11.0
Female	89	89.0
Marital Status of respondents		
Single	24	24.0
Married	76	76.0
Household Size		
1-5	32	32.0
6-10	62	62.0
>11	6	6.0
Educational Status		
No Formal Education	10	10.0
Primary Education	35	35.0
Secondary Education	49	49.0
Tertiary Education	6	6.0
Monthly Income before Ebola		
20,001 – 40,000	54	54.0
40,001 – 60,000	40	40.0
>60,001	6	6.0
Monthly Income after Ebola		
10,001 – 20,000	34	34.0
20,001 – 30,000	52	52.0
>30,001	14	14.0
Marketing Experience		
1 – 5	3	3.0
6 – 10	26	26.0
11 – 15	42	42.0
>15	29	29.0
Membership of cooperative		
Members	64	64.0
Non members	36	36.0
Sources of the Information on EVD Outbreak		
Newspaper	9	9.0
Radio	53	53.0
Television	12	12.0
Family and friends	21	21.0
Agricultural extension agents	5	5.0
Total	100	100.0

Source*:* Field Survey, 2015

Access to consumption credit and membership of cooperatives were factors that could increase household's income ceteris paribus [4], however, the result shows that only 64.0% of the respondents had access to consumption credit and members of cooperatives. This situation has positive impacts on household's income and food demand in the short and long run [4]. Ranking score showed that radio (53.0%), family and friends (21.0%), television (44.2%), newspaper (9.0%) and Agricultural extension agents (5.0%) were major sources of information to the respondents during the outbreak of Ebola Virus Disease in the study area.

Level of awareness of Ebola Virus Disease prevalence

The result in table 2 shows that majority (85.5%) of the respondents were aware of Ebola Virus Disease occurrence in Nigeria, only (14.5%) were not aware of Ebola Virus Disease. Most (88.8%) of the respondents indicated that they were aware of EVD occurrence in Nigeria, whereas (11.2%) of the respondents admitted that they were not aware. This study also reveals that majority (68.7%) of the respondents indicated that they were aware that health personnel were more affected of EVD than other occupation while (31.3%) of the respondents indicated that they were not aware. Besides, most (73.5%) of the respondents were aware that EVD is responsible for low business patronage in recent times and (73.5%) of the respondents were not aware. This study also reveals that, most (70.3) were aware a lots of government activities to control EVD in Nigeria. Most (74.6%) of the respondents were aware that there has been lots of government activities to control EVD in Nigeria, Only (25.4%) of the respondents indicated they were not aware. Moreso, 58.2% of the respondents indicated that they were aware that dead bodies movement were restricted from affected area to non affected region whereas (41.8%) of the respondents were not aware. Most (92.0%) of the respondents were aware of schools closure to curtail the spread of EVD in Nigeria while (8.0%) of the respondents were not aware. Most (55.7%) of the respondents were aware of many agencies and organisations that were involved in EVD control activities in Nigeria while (44.3%) of the respondents were not aware.

Table 2. Distribution of the respondents according to level of awareness of Ebola Virus Disease

Level of Awareness	Aware (%)	Not Aware (%)
Are you aware of how EVD entered Nigeria?	85.5	14.5
EVD has been observed in Nigeria	88.8	11.2
Ebola virus disease occurred year 2014	93.6	6.4
Health personnel were more affected of EVD than other occupations	68.7	31.3
EVD is responsible for low business patronage in recent times	26.5	73.5
Were there restrictions on the supply of bush meat by the government in Nigeria?	70.3	29.7
There has been lots of government activities to control EVD in Nigeria	74.6	25.4
Dead bodies movement were restricted from affected to non affected region	58.2	41.8
Nigerian schools were closed to curtail the spread of EVD outbreak	92.0	8.0
Many agencies and organizations were involved in EVD control activities in Nigeria	55.7	44.3

Source*:* Field Survey, 2015

Bush meat Marketers' Household Food Security Status

A mean per capita monthly food expenditure of ₦5,580.67 with a food security line of ₦3,720.45 was used to classify the bush meat marketers' households either as the food secure or food insecure. Majority (52.3%) of the respondents were found to be food secure while 47.7% were food insecure.

Table 3. Food security status of the respondents in the study area

Food security status	Frequency	Percentage (%)
Food secure	52	52.3
Food insecure	48	47.7
Total	100	100.0
Mean per capita household food expenditure (MPCHHFE) is ₦5,580.67 Food security line (2/3 of MPCHHFE) is ₦3,720.45		

Source*:* Field Survey, 2015

Binary Logit Regression for the Determinants of Household Food Security in the Study Area

Table 4 shows the result of Logit regression used in identifying the determinants of household food security of the respondents. The table indicated that four out of the nine independent variables included in the model were significant in explaining the variation in the food security status of households in the study area. These variables were age, sex, marital status, Household size, Educational status, marketing experience and Monthly income.

Table 4. Result of Binary Logit Regression for the Determinants of Household Food Security in the Study Area;

Variables	Coefficients	Standard Error	Significant
Age(X_1)	-.441	.163	.007***
Sex(X_2)	22.354	6.275E3	.997
Marital status(X_3)	2.378	1.443	.099*
Household size(X_4)	.100	.161	.536
Educational status(X_5)	.232	.125	.062*
Marketing experience(X_6)	.007	.060	.901
Monthly income (X_7)	4.015	2.065	.052*
Constant	10.316	5.307	.052*

Source*:* Field Survey, 2015
* and *** Significant at 10% and 1%

The result shows that age (X_1) has a negative effect on food security and is significant at 1%. The negative sign of the coefficients implies that a unit increase in age of the marketers will lead to 0.441 decreases in the food security status of the respondents; this thus suggests that as respondents grow older, they tend to be less productive and thus less food secured. This is in agreement with the findings of [4], [1], [10], [3] and [9]. With respect to marital status (X_3), the variable was significant at 10% and had a positive relationship with household food security status which indicates that the probability of a household being food secure increases with married household heads. This finding is in line with the finding of [2]. The coefficient of the educational status of household head was found to be positive and significant at 10%. This implies that households with an educated heads are more likely to be food secure than one with uneducated head. This also agrees with [8] Monthly income had a positive coefficient, which though significant at 10%, this agrees with a priori expectation.

Correlation analysis between respondents' monthly income before Ebola Virus Disease outbreak and monthly income after Ebola Virus Disease outbreak in the study area.

The result of paired sampled t-test (p=0.000) in Table 5, showed that there was significant difference between monthly income before Ebola Virus Disease outbreak and monthly income after Ebola Virus Disease outbreak.

Table 5. Correlation for Test of Relationship between Respondents' Monthly Income before and after Ebola Virus Disease Outbreak in the Study Area.

Statement	N	Correlation	Sig.
Monthly income before Ebola virus outbreak and monthly income after Ebola virus outbreak	100	.719	.000

Source*:* Field Survey, 2015

Constraints encountered by the respondents during Ebola Virus Disease outbreak.

Table 6. Distribution of the respondents based on constraints encountered by the Respondents during Ebola Virus Disease outbreak.

Constraints	Minor (%)	Major (%)	Not a Constraint (%)
High cost of preventive measures	38.4	49.0	12.6
Inability to pay daily contribution	55.5	42.5	2.0
Inability in meeting family food consumption	44.1	26.1	29.8
Inability to meet cooperative promises	91.8	7.0	1.2
Discrimination of the infected person	70.0	20.3	9.7
Distant location of personal preventive equipment distribution centre	40.7	49.0	10.3

Source*:* Field Survey, 2015

Table 6 indicates that Inability to meet cooperative promises (91.8%), Discrimination of the infected person (70.0%), Inability to pay daily contribution (55.5%) and were the minor constraints faced by the respondents during the outbreak, while high cost of preventive measures (49.0%), Distant location of personal preventive equipment distribution centre (49.0%), were the major constraints faced by the respondents.

CONCLUSIONS

The study concludes that, the level of knowledge on Ebola Virus Disease by the respondents was high and has affected bush meat through the reduction in the number of work days in the market; reduction in reduction in sales and marketing profit; and change in livelihood. Based on this, the study recommends that:

(i)Proper management practices and bio-security measures that serve as good disease control measures should be implemented by the government.

(ii) Extension service personnel that will help in the dissemination of appropriate health information education to farmers should be adequately employed.

(iii)Social protection, livelihood regeneration, income support and safety net programmes must be institutionalised in seriously affected communities.

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PERCEPTION AND ATTITUDINAL BEHAVIOR OF LECTURERS' IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY TOOLS IN TEACHING/LEARNING IN MICHAEL OKPARA UNIVERSITY OF AGRICULTURE UMUDIKE

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Abstract

The study investigated perception and attitudinal behavior of lecturers in the use of ICT in classroom teaching and learning in Michael Okpara University of Agriculture, Umudike. A structured questionnaire was administered on a 5 point Likert-type questions to 120 of the 550 lecturers following simple random technique. The collected data were analyzed by finding means of respondents' feelings and hypothesis with correlation coefficient. The means showed that ICT facilities are not frequently used in classroom teaching/learning by the lecturers ($\bar{x}$ = 2.20). However, multimedia projector ($\bar{x}$ = 3.49) and computer ($\bar{x}$ = 3.36) were mostly used. The lecturers perception ($\bar{x}$ = 3.05) was positive and their attitudinal behavior ($\bar{x}$ = 2.89) was negative in the use of ICT in classroom. The correlation coefficient (r) was 0.373 and significant at 5% critical alpha level. It implies that there was a positive significant relationship between perception of ICT and attitude of the lecturers in the use of ICT. We advised that lecturers should put in more effort in the use of ICTs order than the multimedia and computer in classroom teaching/learning.

Key words: *attitude, lecturers, perception, information and communication technology*

INTRODUCTION

The utilization of Information and Communication Technology tools in education has been increasingly felt in this era of globalization where information is received through satellite and internet connectivity [12, 16]. According to [13] ICT is seen as constituting a digital divide among University freshmen. ICT is described as an expanding assembly of technologies that are used to handle information [3]. Based on this growing popularity of the use of ICT for effective teaching and learning, many institutions are investing heavily in ICT infrastructure and aim at exploiting it to the maximum extent possible [15].

One major concern in this endeavor however has been on lecturers' willingness to use ICT facilities in classroom teachings. Thus, [5] are of the opinion that not all University academic teachers use ICT in delivering their lectures and creative output for academic purposes but many use such facilities frequently for personal gains. They stressed that majority of university lecturers rely heavily on manual and traditional teaching methods in delivering their lectures. Although, [10] noted that teachers use less of ICT facilities in the classrooms and for research purposes because they are yet to be sufficiently skilled in its use.

It is assumed that how a lecturer perceives ICT influences his or her attitude to its usage. There should be a strong correlation between a lecturer's perception and his or her attitude towards ICT use for effective use of the technology in teaching. Perception means the opinion of the individual or a group on an issue and this precedes action/behavior [7]. The opinion guides action or behavior of the individual or group towards the way a technology is used. However, [2] described attitude closely as a way of thinking or feeling of a person which makes him or her to behave or act in a particular way. Also [4] stated that people's attitude correspond with their behavior.

One weakness of the University is poor usage of information and communication technology (ICT) and low level of computer use [8]. On the interim, there is existence of AfriHUB-MOUAU Integrated ICT Centre. However, [5] affirmed that one of the greatest challenges to ICT usage is absence of positive attitude to change. Since perception guides action and influences the attitude and behavior, it is imperative we examine at the perception and attitudinal behavior of lecturers on the use of ICT tools for classroom teaching/learning in a Nigerian University to help influence education policies.

Hence, the specific objectives of this study were to:

-determine the perception of lecturers towards usage of ICT facilities in teaching and learning;

-determine frequency of use of ICT facilities for teaching/learning in the study institution;

-determine attitudes of the respondents in the use of ICT facilities in the study institution.

The following in null form was tested:

Ho_1: There is no significant relationship between the lecturers' perception and their attitude on the use of ICT tools in classroom teaching/learning.

MATERIALS AND METHODS

The study was carried out in Michael Okpara University of Agriculture, Umudike. This University of Agriculture in Umudike is among the three specialized universities of Agriculture in Nigeria. It was established by the Federal Government of Nigeria in 1992, with formal activities started in1993. Umudike is about 10km from Umuahia the capital city of Abia state in Southeastern part of Nigeria. Umudike lies between Longitudes $7^{0\ o'E}$ and $7^0$5'E and Latitudes $5^{0\ 0'N}$ and $5^0$25'N [11] on an altitude of 122m above sea level. The major link road to the University is Umuahia-Ikot Ekpene federal road that is a direct route to state capitals of Akwa Ibom and Cross River States. The University runs a collegiate system with academic activities grouped into colleges, housing departments. Simple random sampling procedure was adopted across the colleges and departments to interview 120 lecturers using a structured questionnaire. The questionnaire consisted of 5 point Likert-type questions.

Descriptive statistics of mean and standard deviation were used for the analysis. On the question of use of ICT tools, ratings were: very high frequency use (5); high frequency use (4); moderate frequency (3); low frequency use (2) and very low frequency use (1).

The objectives that sought for perception and attitude were achieved based on perceptional and attitudinal statements asked in the questionnaire. These were rated with: strongly agree (5); Agree (4); undecided (3); disagree (2) and strongly disagree (1). Values of 5, 4, 3, 2 and 1 were assigned to the options respectively. The values were summed up and further divided by 5 to sustain the midpoint value of 3.0, i.e.

$$\frac{5+4+3+2+1}{5} = 3.0$$

The mean score dichotomized perception and decision into positive and negative. Mean score of 3.0 and above was rated positive perception or attitude, while order wise it was negative. In testing the relationship between perception and attitude of the respondents in ICT use, Pearson product moment correlation t-test was used:

$$t = \frac{r\sqrt{n-2}}{1-r^2} \quad \text{with n-2 d.f.}$$

where;
n = sample size,
r = correlation coefficient

RESULTS AND DISCUSSIONS

Perception of lecturers to use of ICT Facilities

Table 1 reveals that the perception of the academic staff on the use of ICT facilities was positive with grand mean score of 3.05. This implies that the respondents appreciated the benefits accrued by the use of ICT facilities such as receiving information through satellite and internet connectivity.

It is an indication that the positive perception will precede action/behavior and people are able to synthesize and integrate series of new information in the light of what they know and make a meaning out of it.

This is in line with [6] who opine that perception modifies actions in terms of people's behavior.

Table 1. Mean scores and standard deviation of the respondent's perception on the use OF ICT facilities

Perceptional Statements	**Mean score**	**Standard Deviation**
Quick and easy completion of my tasks on agriculture (provide conveniences)	3.27	0.22
Enhances the work productivity on agriculture	3.27	0.22
Updating agricultural information	3.19	0.14
Help to improve the preparation of instructional materials on agriculture	3.13	0.08
Makes teaching/research explanations very easy/understandable	3.17	0.12
Material on agriculture can be accessed from anywhere in the world	3.20	0.15
Helps to get more information from my fellow researchers about new technologies	3.13	0.08
Replace human being interaction	2.37	- 0.68
Difficult to use except someone help out	2.60	- 0.45
Difficult to use without electricity supply	3.15	0.10
Total Mean scores	**30.48**	
Grand Mean score	**3.05**	

Source: Own calculation

ICT frequently used in Teaching/Learning.

Table 2 shows the mean scores and standard deviation of frequency of use of ICT facilities in the classroom in the institution. A grand mean score of 2.20 was below benchmark mean score of 3.0, an indication that these facilities were not often used in the classroom teaching.

Table 2. Mean Scores and Standard deviation of frequently used ICT facilities by the respondents in the classroom.

ICT Facilities	**Mean score of frequency of use**	**Standard deviation**
Electronic Database (Agora TEEAL)	1.44	-0.76
Electronic Bulletin Board Service	1.60	-0.60
Multimedia Projector	3.49	1.29
Internet	2.45	0.25
Computer	3.36	1.16
Electronic Journal/Book	2.29	0.09
Geographic Information System (GIS)	1.49	-0.71
Video Conferencing	1.41	-0.79
Total Mean	**17.53**	
G. Mean	**2.20**	

Source: Own calculation

It implies that the lecturers rely on manual and traditional methods in delivering their lectures. This is in agreement with the works of [5] and [11] that University academic staffers rely heavily on manual and traditional practices and were less prepared for the use of ICT in the classroom. However multimedia projector ($\overline{x}$ = 3.49) and Computer ($\overline{x}$ = 3.36) were frequently used facilities for teaching/ learning. The concurrent frequent use of these facilities indicated that they are used simultaneously, since the use of one supported the use of the other. On the other hand, the mean score for video conferencing ($\overline{x}$ = 1.41) shows that it is not widely used and known in the institution.

Respondents Attitudes to ICT use for Teaching/Learning in classroom.

Table 3 shows that respondents attitude towards ICT use in teaching/learning in the classroom has a grand mean score of 2.92. This grand mean score (2.92) indicates that the lecturers attitude towards the use of ICT in teaching/learning is negative, below the threshold mean score of 3 0. The reason could be attributed to the negative laissez faire attitude or still lacking in skills as they are not well versed with ICT usage or resist the use. The finding is in line with [1]; [9] and Dalgarno and Grey (2010) cited in [5] stating that lecturers exhibit laissez faire, lack skills and resist use of ICTs in the classroom. Thus the negative attitude corresponds with the frequency of use in the classroom, indicating that individual lecturer may have all the necessary knowledge but refuses to adopt and used ICT facilities in the classroom teaching.

Table 3. Attitudinal behavior of lecturers towards ICT use in teaching and learning

Attitudinal Statements	**Mean score**	**Standard deviation**
I still use old teaching methods even when ICT facilities are available	3.85	0.93
I combine both manual/traditional and new ICT facilities methods	2.93	0.01
I feel less confidence in using ICT facilities	2.25	- 0.67
It causes anxiety when I am using them	2.61	- 0.31
I feel it wastes more time than old teaching methods	2.96	0.04
I have a laissez faire attitudes towards using them	2.91	- 0.01
Total Mean scores	**17.51**	
Grand Mean score	**2.92**	

Source: Own calculation

Hence [5] confirmed that one of the greatest challenges to ICT is lack of positive attitude to change.

Correlation between perception and attitude of lecturers in ICT use

The Pearson's product moment correlation shows correlation coefficient (r) 0.373 was significant at 5% alpha level. It implies that there was a significant relationship between the perception of ICT and the attitude of the academic staff towards the use of ICT facilities in teaching and learning. Therefore, the null hypothesis which states that there is no significant relationship between the perception and attitude of lecturers in ICT use in the classroom teaching is hereby rejected. This shows that with constant use of ICT by lecturers, teaching will be more interesting and free flow of information which enhances learning.

CONCLUSIONS

ICT facilities are frequently not used by lecturers in classroom teaching/learning except multimedia projector and computer which seemed to be in constant use for the purpose. The perception of the lecturers towards use of ICT was positive while their attitude was negative to the use of ICTs in teaching/ learning. We recommend a constant use of ICT facilities in classroom teaching and learning as this will facilitate teaching and encourage free flow of information which enhances learning.

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EFFECTS OF PRE AND POST CONSOLIDATION POLICY IN NIGERIAN BANKS ON AGRIBUSINESS SECTOR PERFORMANCE (1995-2014): A COMPARATIVE ANALYSIS

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Abstract

This study is a comparative analysis of the effects of pre and post-consolidation policy in Nigerian banks on agribusiness sector performance which covered 1995-2014 periods. Secondary data from CBN annual reports and statement of accounts, CBN bulletin and National Bureau of Statistics were used for the study. The data were analyzed by the use of t-students distribution. This paper used agribusiness output, number of agribusiness entrepreneurs that accessed the credits, government credit allocation to agribusiness and value of banks' credit allocation to agribusiness as indices to determine agribusiness sector performance by comparing the pre-mergers and acquisition consolidation policy with the post-merger and acquisition consolidation policy for the period under review. Findings shown that the purposes for credit allocation among agribusiness sub-sectors in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions were mainly for the production of crop, livestock, fishery, mixed farming and others. In the post-merger and acquisition consolidation policy era, number of agribusiness farmers that accessed the credit through Agricultural Credit Guaranteed Scheme Fund (ACGSF), government credit to agribusiness enterprises, value of banks' credit to agribusiness, agribusiness output was higher than the pre-merger and acquisition consolidation era of Nigerian banking institutions. The study concluded that consolidation policy in the Nigerian banking institutions influenced the agribusiness sector performance. It was recommended that efforts must be made by the Central Bank of Nigeria to see that such policy is sustained.

Key words: *agribusiness sector performance, Nigerian banks, pre and post-consolidation, policy*

INTRODUCTION

The primary objective of Nigerian banks' consolidation policy was to guarantee an efficient and a sound financial system. The policy was designed to enable the banking sector develop the required capacity to support the economic development of the nation by efficiently performing its functions as the head of financial intermediation [21]. In 2004, the CBN announced a new 13 point reform agenda which was intended to promote soundness, stability and efficiency of the Nigerian banking institutions and to enhance its competitiveness in the African regional and global financial system. The attempt to meet the minimum capital base triggered the merger and acquisition in the banking industry. Merger and acquisition, which are divisions of consolidation are commonplace in developed countries of the world but are just becoming prominent in Nigeria especially in the banking sector [22]. The issue of merger and acquisition in the banking institution started in October, 2003 under the past CBN Governor, Prof. Soludo. Though, most of the feeble banks were unwilling to comply until the new order on July 6, 2004. The situation changed from July 6, 2004 as many banks had either merged with or acquired other banks. Thus, merger and acquisition as consolidation tools has become a near permanent feature of our financial system after July 6, 2004. The policy of ₦25billion minimum capital base forced banks to enter into merger and acquisition to meet the requirement [24, 11, 4].

Since agriculture is dependent on finance, Nigerian agricultural policy should provide among others, for adequate financing of agriculture. The role of finance in agriculture, just like in the industrial and service sectors, cannot be over-emphasized, given that it is the oil that lubricates production. Public expenditure on agriculture has, however, been shown not to be substantial enough to meet the objective of the Government agricultural policies. The objective of agricultural financing policies in Nigeria is to establish an effective system of sustainable agricultural financing schemes, programmes and institutions that could provide micro and macro credit facilities for the Since agriculture is dependent on finance, Nigerian agricultural policy should provide among others, for adequate financing of agriculture. The role of finance in agriculture, just like in the industrial and service sectors, cannot be over-emphasized, given that it is the oil that lubricates production. Public expenditure on agriculture has, however, been shown not to be substantial enough to meet the objective of the Government agricultural policies. The objective of agricultural financing policies in Nigeria is to establish an effective system of sustainable agricultural financing schemes, programmes and institutions that could provide micro and macro credit facilities for the micro, small, medium and large scale producers, processors and marketers [18].

According to [2], research on consolidation exercise in Nigeria employed capital adequacy asset quality liquidity and management. 2004-2005 was regarded as the pre consolidation period while 2006-2009 was regarded as the post consolidation period, she concluded that consolidation improved the overall performance of banks in terms of assets size, deposit base, capital base and capital adequacy, however it did not contribute to the profit efficiency of those commercial banks. Using the dynamic panel GMM method on a cross sectional data from 2000-2010, [6] came to a conclusion that consolidation specifically reduced foreign ownership of commercial banks and also through merger and acquisition banks were more cost efficient. The investigation carried out by [10] on the effects of mergers and acquisitions on the efficiency of financial intermediation in the Nigerian banking industry had evidence that the consolidation programme induced mergers and acquisitions in the banking industry and improved competitiveness and efficiency of the borrowing and lending operations of the Nigerian banking industry. [17] Investigated the efficiency of the Nigerian banking system between 1999 and 2005. Bank efficiency was evaluated using Data Envelopment Analysis (DEA). The results indicated that efficiency fluctuated during the first part of the period and improved during the recent years, a period associated with the increase in minimum capital requirement, differences in banks' efficiency was explained by problematic loans and their size. [9] Investigated the impact of the consolidation on banking industry in the Nigerian Capital Market between 2004 and 2008 using primary (questionnaires) and secondary data from the Nigerian Stock Exchange. When the data was analyzed with the chi-square test and ANOVA, it was found that bank consolidation affected the industry significantly as most of the banks had to go to the capital market to raise the required amount by issuing securities. They submitted that banks' consolidation had increased public awareness and operations of the Nigerian capital market just as the capital market had continued to be an easy and cheap source of funds for banks in the post-consolidation era. Based on their findings, it was recommended that the banks and capital market regulatory authorities should continue to monitor and institute reforms program that would better reposition the banking industry as a major player in the Nigerian Capital Market and the economy. [1] Evaluated the impact of mergers and acquisitions on performance of banks in Nigeria. Pre-merger and post-merger financial statements of two consolidated banks were obtained, adjusted, carefully analyzed and compared. The result revealed that all the two groups produced in addition to operational and relational synergy, financial gains far more than the 2+2=5 synergistic effects. Ratio technique and inferential statistical tools were used to highlight synergistic effects on the merging banks. [8] used 1980-1988 as its study scope and the Thick Frontier Approach (TFA) method. The study found out that deregulation of deposit rates caused an increase in average cost in US banks especially the smaller ones, hence it led to reduced efficiency while during post deregulation periods, and their average cost fell owing to the structural change. [23] employed data envelopment analysis (DEA) to study the efficiencies of banking institutions in Nigeria under the privatization policy, the study showed that the efficiency of the Nigerian banking system declined significantly during period of financial deregulation compared to its levels before consolidation, they also discovered that privately owned banks operated more efficiently than government owned banks.

MATERIALS AND METHODS

This study used 25 consolidated Nigerian banking institutions, precisely commercial banks operating in the country some of which were merged and acquired as a result of the consolidation policy by CBN in order to strengthen the financial system of the banks. The study used secondary data, mostly time series. Data on bank's credit allocation to agribusiness sector, agribusiness output, and government credit allocation in agribusiness sector of the economy, merger and acquisition consolidation policy in the Nigerian banking institutions were collected from the publications of development finance and research department of the CBN, National Bureau of Statistics (NBS). Descriptive statistics and t-students distribution were employed in analyzing the data. The various models that were used to analyze the data for the study are specified below:

$$t=\frac{\bar{X}_1-\bar{X}_2}{\sqrt{S_P\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}} \text{ .... (1)}$$

Where S_P = pooled variance and is given as:

$$S_p=\frac{(n_{1-1})S_1^2-(n_{1-1})S_2^2}{n_{1+}n_{2-2}} \text{ ……………..… (2)}$$

Where:

$\overline{X_1^4}$ = The mean value and growth in government credit allocation to agribusiness activities, agribusiness output, number and value of bank’s credit allocation to agribusiness sector pre-merger and acquisition consolidation policy era in the Nigerian banking institutions.

$\overline{X_2}$ = The mean value and growth in government credit allocation to agribusiness activities, agribusiness output, number and value of bank’s credit allocation to agribusiness sector during post-merger and acquisition consolidation policy era in the Nigerian banking institutions.

S_1^2= Variance of the value and growth in government credit allocation to agribusiness activities, agribusiness output, number and value of bank’s credit allocation to agribusiness sector in the pre-merger and acquisition consolidation policy era in the Nigerian banking institutions.

S_2^2= Variance of the value and growth in government credit allocation to agribusiness activities, agribusiness output, number and value of bank’s credit allocation to agribusiness sector during post-merger and acquisition consolidation policy era in the Nigerian banking institutions.

n_1 = number (years) of sampled value and growth in government credit allocation to agribusiness activities, agribusiness output, number and value of bank’s credit allocation to agribusiness sector in the pre-merger and acquisition consolidation policy era in the Nigerian banking institutions.

n_2= number (years) of sampled value and growth in government credit allocation to agribusiness activities, agribusiness output, number and value of bank’s credit allocation to agribusiness sector during post-merger and acquisition consolidation policy era in the Nigerian banking institutions.

$n_{1\,+}\,n_2 - 2$ = degree of freedom.

RESULTS AND DISCUSSIONS

Table 1 showed the purpose for which credit was allocated and utilization percentage share of the number of agribusiness enterprises in the pre-merger and acquisition consolidation policy in the Nigerian banking institutions.

Table 1. Purpose for credit allocation and utilization percentage share of number of credit granted among agribusiness sub-sectors in the pre-merger and acquisition consolidation policy (2005-2014) in the Nigerian banking institutions

ENTERPRISES	NUMBER OF LOANS GRANTED BY PURPOSE			PERCENTAGE SHARE (%)		
	PREMAP	DMAP	DIFFERENCE	PREMAP	DMAP	DIFFERENCE
CROPS	**181,074**	**372,520**	**-191,446**	**90.6**	**87.5**	**3.1**
CASH CROPS	3,686	6,584	-2,898	1.8	1.5	0.3
OIL PALM	345	2,554	-2,209	0.2	0.6	-0.4
RUBBER	21	119	-98	0.0	0.0	0.0
COCOA	291	1,932	-1,641	0.1	0.5	-0.3
COTTON	1,367	539	828	0.7	0.1	0.6
GROUNDNUTS	1,662	1,415	247	0.8	0.3	0.5
GINGER	0	24	-24	0.0	0.0	0.0
FOOD CROPS	177,388	365,937	-188,549	88.7	85.9	2.8
VEGETABLES	0	14,734	-14,734	0.0	3.5	-3.5
BEANS	0	3,449	-3,449	0.0	0.8	-0.8
SOYA BEANS	0	321	-321	0.0	0.1	-0.1
GRAINS	135,505	263,699	-128,194	67.8	61.9	5.9
ROOTS AND TUBER	41,883	83,735	-41,852	21.0	19.7	1.3
LIVESTOCK	**9,513**	**27,884**	**-18,371**	**4.8**	**6.5**	**-1.8**
POULTRY	5,989	18,199	-12,210	3.0	4.3	-1.3
CATTLE	1,734	6,050	-4,316	0.9	1.4	-0.6
SHEEP/GOAT	1,070	969	101	0.5	0.2	0.3
OTHER LIVESTOCK	720	2,667	-1,947	0.4	0.6	-0.3
FISHERY	**1,470**	**12,067**	**-10,597**	**0.7**	**2.8**	**-2.1**
MIXED FARMING	**350**	**8,637**	**-8,287**	**0.2**	**2.0**	**-1.9**
OTHERS	**7,471**	**4,702**	**2,769**	**3.7**	**1.1**	**2.6**
GRAND TOTAL	**199,878**	**425,810**	**-225,932**	**100.0**	**100.0**	**-**

Source: Computed by the author from CBN (2014) Annual Report and Statement of Accounts for the year Ended 31st December, 1995-2014. PreMAP = Pre-merger and acquisition consolidation policy of Nigerian banking institutions; DMAP = During the post-merger and acquisition consolidation policy of Nigerian banking institutions

Evidence from the sectoral allocation of loans by Nigerian banking institutions shows variation in the number of loans granted to different agribusiness enterprises. The purposes for credit allocation among agribusiness subsectors in the pre (1995-2004) and post (2005-2014) merger and acquisition consolidation policy in the Nigerian banking institutions were mainly for the production of crop, livestock, fishery, mixed farming and others. The crops of interest for which loans were granted in the crop subsector include oil palm, rubber, ginger, cotton, cocoa, groundnut, vegetables, beans, soya beans, grains, roots and tubers. The livestock of interest for which loans were granted in the livestock subsector include poultry, cattle, sheep, goats and other livestock as given in CBN annual reports and Statement of Accounts.

A cumulative number of 199,878 agribusiness entrepreneurs of different categories benefited from loans allocated by Nigerian banking institutions in the pre-merger and acquisition consolidation policy era (1995-2004) while a cumulative number of 425,810 agribusiness entrepreneurs of different categories benefited from loans allocated by Nigerian banking institutions during the post-merger and acquisition consolidation policy era (2005-2014). During the post-merger and acquisition consolidation policy of Nigerian banking institutions (2005-2014), about 225,932 agribusiness entrepreneurs were granted loans by Nigerian banking institutions than was witnessed in pre-merger and acquisition consolidation policy era of Nigerian banking institutions. This implies that merger and acquisition consolidation policy of the Nigerian banking institutions led to an increase in the number of agribusiness entrepreneurs granted credit in Nigeria. Between 1995 and 2004 (pre-merger and acquisition consolidation policy era of Nigerian banking institutions), Nigerian banking institutions under the Agricultural Credit Guarantee Scheme financed 181,074 crop projects; 9,513 livestock projects and 1,470 fisheries projects, 350 mixed farming projects and 7,471 other projects. Within the crop subsector, about 3686 cash crop projects were financed by Nigerian banking institutions under the Agricultural Credit Guarantee Scheme while 177,388 food crops projects were financed by Nigerian banking institutions under the Agricultural Credit Guarantee Scheme. Cash crops enterprises that were purposely financed by Nigerian banking institutions under the Agricultural Credit Guarantee Scheme include oil palm enterprise (345 financed projects); rubber enterprise (21 financed projects); cocoa enterprise (291 financed projects); cotton enterprise (1,367 financed projects) and groundnut enterprise (1,662 financed projects). Food crops enterprises that were purposely financed by Nigerian banking institutions under the Agricultural Credit Guarantee Scheme include grains enterprise (135,505 financed projects) and root and tubers enterprises (41,883 financed projects). Similarly, livestock enterprises that were purposely financed by Nigerian banking institutions under the Agricultural Credit Guarantee Scheme includes poultry enterprise (5,989 financed projects); cattle enterprise (1,734 financed projects); sheep/goats enterprise (1,070 financed projects); and other livestock enterprise (720 financed projects). Between 2005 and 2014 (During the post-merger and acquisition consolidation policy era of Nigerian banking institutions), Agricultural Credit Guarantee Scheme financed 372,520 crop projects, 27,884 livestock projects and 12,067 fisheries projects, 8,637 mixed farming projects and 4,702 other projects. Within the crop subsector, about 6,584 cash crop projects were financed while 365,937 food crops projects were financed. Cash crops enterprises that were purposely financed by Nigerian banking institutions under the Agricultural Credit Guarantee Scheme include oil palm enterprise (2,554 financed projects); rubber enterprise (119 financed projects); cocoa enterprise (1,932 financed projects); cotton enterprise (539 financed projects); ginger enterprise (24 financed projects) and groundnut enterprise (1,415 financed projects). Food crops enterprises that were purposely financed by Nigerian banking institutions under the Agricultural Credit Guarantee Scheme include vegetables enterprises (14,734 financed projects); beans enterprises (3,449 financed projects); soya beans enterprises (321 financed projects); grains enterprise (263,699 financed projects) and root and tubers enterprises (83,735 financed projects). Similarly, livestock enterprises financed under the Agricultural Credit Guarantee Scheme includes poultry enterprise (18,199); cattle enterprise (6,050); sheep/goats enterprise (969); and other livestock enterprise (2,667). The difference column in table 4.6 indicated that more agribusiness entrepreneurs involved into different crop enterprises such as oil palm enterprise, rubber enterprise, cocoa enterprise, ginger enterprise, vegetables enterprise, beans enterprise, soya beans enterprise, grains enterprise, and root and tuber enterprise were granted loans by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme during the post-merger and acquisition consolidation policy era except for crops like groundnut and cotton which received more number of loans granted by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme in the pre-merger and acquisition consolidation policy era of the Nigerian banking institutions. In the livestock subsector, more poultry, cattle and other livestock enterprises were financed by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme during the post-merger and acquisition consolidation policy era of the Nigerian banking institutions except for the sheep/goats enterprise which received more number of loans granted by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme in the pre-merger and acquisition consolidation policy era of the Nigerian banking institutions.

Pre-merger and acquisition consolidation policy era of the Nigerian banking institutions (1995 – 2004), the utilization percentage share of loans to different enterprises by number shows that crop based projects accounted for approximately 90.6% in cumulative number of loans, livestock based projects accounted for 4.8% in total number of loans, fisheries based project's total share was just a paltry 0.7% in total number of loans, mixed farming based projects accounted for a paltry 0.2% in total number of loans while others based projects accounted for 3.7 % in total number of loans guaranteed. In the crops subsector, food crops based projects accounted for 88.7% in total number of loans while cash crop based projects accounted for a paltry 1.8% in total number of loans. Grains based projects were the most financed projects in the crop subsector and accounted for 67.8% in total number of loans while as in the livestock subsector, poultry based projects were the most financed projects and accounted for 3.0% in total number of loans guaranteed by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme.

During the post-merger and acquisition consolidation policy era of the Nigerian banking institutions (2005-2014), the utilization percentage share of loans to different enterprises by number shows that crop based projects accounted for approximately 87.5% in cumulative number of loans, livestock based projects accounted for 6.5% in total number of loans, fisheries based project's total share was 2.8 % in total number of loans, mixed farming based projects accounted for 2.0% in total number of loans while others based projects accounted for 1.1 % in total number of loans guaranteed. In the crops subsector, food crops based projects accounted for 85.9% in total number of loans (reduced by 2.8% from its percentage share in the pre-merger and acquisition consolidation policy era) while cash crop based projects accounted for a paltry 1.5% in total number of loans (reduced by 0.3% from its percentage share in the pre-merger and acquisition consolidation policy era). Grains based projects were the most financed projects in the crop subsector and accounted for 61.9% in total number of loans (reduced by 5.9% from its percentage share in the pre-merger and acquisition consolidation policy era) while as in the livestock subsector, poultry based projects were the most financed projects and accounted for 4.3% in total number of loans guaranteed by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme (increased by 1.3% from its percentage share pre-merger and acquisition policy era). Livestock, fishery and mixed farming enterprises increased by 1.8%, 2.1% and 1.9% from their utilization percentage share in the pre-merger and acquisition consolidation policy era respectively while as crops and other enterprises reduced by 3.1% and 2.6% from their utilization percentage share in the pre-merger and acquisition consolidation policy era during the post-merger and acquisition policy era of the Nigerian banking institutions (2005-2014). The result suggested that merger and acquisition consolidation policy of the Nigerian banking institution has a reallocation effect on the total number of loans granted to different agribusiness subsectors of the Nigerian economy. This might not be purposive on the part of the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme but however, established the fact that most poorly financed agribusinesses in Nigeria were made better off by the introduction of merger and acquisition consolidation policy in the Nigerian banking institutions.

Evidence from the sectoral allocation of loans by Nigerian banking institutions presented in Table 2 shows variation in the value of loans granted to different agribusiness enterprises. A cumulative value of loans of ₦12, 675,809.90 was granted to agribusiness entrepreneurs of different categories by Nigerian banking institutions in the pre-merger and acquisition consolidation policy of Nigerian banking institutions (1995-2004) while a cumulative value of loans of ₦106, 492,321.19 was granted to agribusiness entrepreneurs of different categories by Nigerian banking institutions during the post-merger and acquisition consolidation policy of Nigerian banking institutions (2005-2014).

Table 2. Purpose for credit allocation and utilization percentage share of value of credit granted among agribusiness subsectors in the pre (1995 -2004) and post-merger and acquisition consolidation policy (2005-2014) in the Nigerian banking institutions.

ENTERPRISES	**VALUE OF LOANS (N' MILLION)**			**PERCENTAGE SHARE (%)**		
	PREMAP	**DMAP**	**DIFFERENCE**	**PREMAP**	**DMAP**	**DIFFERENCE**
CROPS	**5,635,299.90**	**41,570,480.84**	**-35,935,180.94**	**44.5**	**39.0**	**5.4**
A)CASH CROPS	**111,679.00**	**1,288,626.06**	**-1,176,947.06**	**0.9**	**1.2**	**-0.3**
OIL PALM	26,223.80	768,682	-742,457.80	0.2	0.7	-0.5
RUBBER	1,230.00	14,351	-13,121.00	0.0	0.0	0.0
GINGER	0.00	3,840	-3,840.00	0.0	0.0	0.0
COTTON	39,372.50	58,330	-18,957.50	0.3	0.1	0.3
GROUNDNUTS	30,437.70	80,866	-50,428.20	0.2	0.1	0.2
COCOA	14,415.00	362,558	-348,142.56	0.1	0.3	-0.2
B)FOOD CROPS	**5,523,620.90**	**40,281,854.78**	**-34,758,233.88**	**43.6**	**37.8**	**5.8**
VEGETABLES	0.00	956,838	-956,838.10	0.0	0.9	-0.9
BEANS	0.00	261,259	-261,258.66	0.0	0.2	-0.2
SOYA BEANS	0.00	68,566	-68,566.47	0.0	0.1	-0.1
GRAINS	3,887,329.50	24,326,453	-20,439,123.01	30.7	22.8	7.8
TUBERS/ROOTS	1,636,291.40	14,668,739	-13,032,447.64	12.9	13.8	-0.9
LIVESTOCK	**557,003.00**	**9,157,584.56**	**-8,600,581.56**	**4.4**	**8.6**	**-4.2**
POULTRY	439,974.90	6,516,907	-6,076,932.24	3.5	6.1	-2.6
CATTLE	59,733.80	1,507,393	-1,447,658.97	0.5	1.4	-0.9
SHEEP/GOATS	19,229.60	257,374	-238,143.90	0.2	0.2	-0.1
OTHERS LIVESTOCK	38,064.70	875,911	-837,846.45	0.3	0.8	-0.5
FISHERIES	**75,025.50**	**2,200,817**	**-2,125,791.39**	**0.6**	**2.1**	**-1.5**
MIXED FARMING	**28,108.00**	**1,337,374**	**-1,309,265.50**	**0.2**	**1.3**	**-1.0**
OTHERS	**188,070.60**	**1,498,000**	**-1,309,929.41**	**1.5**	**1.4**	**0.1**
TOTAL	**12,675,809.90**	**106,492,321.19**	**-93,816,511.29**	**100**	**100**	

Source: Computed by the author from CBN (2014) Annual Report and Statement of Accounts for the year Ended 31st December, 1995-2014. PreMAP = Pre-merger and acquisition consolidation policy of Nigerian banking institutions; DMAP = During the post-merger and acquisition consolidation policy of Nigerian banking institutions

During the post-merger and acquisition consolidation policy of Nigerian banking institutions (2005-2014), about ₦93,816,511.29 loans was granted to agribusiness enterprises by Nigerian banking institutions than was witnessed in the pre-merger and acquisition consolidation policy era of Nigerian banking institutions. This implies that merger and acquisition consolidation policy led to an increase in the value of loans granted to agribusiness enterprises in Nigeria.

Between 1995 and 2004 (pre-merger and acquisition consolidation policy era of Nigerian banking institutions), Nigerian banking institutions under the Agricultural Credit Guarantee Scheme financed crop projects to the tune of ₦5, 635, 299.9million; livestock projects to the tune of ₦557, 003.00 million; fisheries projects to the tune of ₦75, 025.50 million; mixed farming projects to the tune of ₦28, 108.00 million; and other projects to the tune of ₦188, 070.60 million. Within the crop subsector, the value of loans granted for cash crop projects and food crop projects by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme were ₦111,679.00 million and ₦5, 523,620.90 million respectively. The value of loans granted to different cash crops enterprises include oil palm enterprise (₦26,223.80 million); rubber enterprise (₦1,230.00 million); cocoa enterprise (₦14,415.00 million); cotton enterprise (₦39,372.50 million) and groundnut enterprise (₦30,437.70 million). The value of loans granted to different food crops enterprises include grains enterprise (₦3,887,329.50 million) and root and tubers enterprises (₦1,636,291.40 million). Similarly, the value of loans granted to different livestock includes poultry (₦439, 974.90 million); cattle (₦59,733.80 million); sheep/goats enterprise (₦19,229.60 million); and other livestock (₦38,064.70 million). Between 2005 and 2014 (During the post-merger and acquisition consolidation policy era of Nigerian banking institutions), Nigerian banking institutions under the Agricultural Credit Guarantee Scheme financed crop projects to the tune of ₦41,570,480.84 million; livestock projects to the turn of ₦9,157,584.56 million; fisheries projects to the tune of ₦2,200,817 million; mixed farming projects to the tune of ₦1,337,374 million; and other projects to the tune of ₦1,498,000 million. Within the crop subsector, the value of loans granted for cash crops and food crop projects by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme were ₦1, 288,626.06 million and ₦40, 281,854.78million respectively. The value of loans granted to different cash crops enterprises include oil palm enterprise (₦768,682 million); rubber enterprise (₦14,351million); ginger enterprise (₦3,840 million); cocoa enterprise (₦362,558 million); cotton enterprise (₦58,330 million) and groundnut enterprise (₦80,866 million). The value of loans granted to different food crops enterprises include vegetable enterprise (₦956,838 million); beans (₦261,259 million); soya beans (₦68,566 million); grains enterprise (₦24,326,453 million) and root and tubers enterprises (₦14,668,739 million). Similarly, the value of loans granted to different livestock enterprises include poultry enterprise (₦6,516,907 million); cattle enterprise (₦1,507,393 million); sheep/goats enterprise (₦257, 374 million); and other livestock enterprise (₦875, 911 million).

The difference column in Table 2 indicated that for the value of loans granted to all the subsectors under the Agricultural Credit Guarantee Scheme Fund more loans were granted to different enterprises such as oil palm enterprise, rubber enterprise, cocoa enterprise, ginger enterprise, vegetables enterprise, beans enterprise, soya beans enterprise, grains enterprise, and root and tuber enterprise, poultry, cattle, sheep/goats fishery, other livestock, mixed farming etc were granted loans by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme during the post-merger and acquisition consolidation policy era of the Nigerian banking institutions than pre-merger and acquisition consolidation policy era of the Nigerian banking institutions.

In the pre-merger and acquisition consolidation policy era of the Nigerian banking institutions (1995 – 2004), the utilization percentage share of loans to different enterprises by value shows that crop based projects accounted for approximately 44.5% in cumulative value of loans, livestock based projects accounted for 4.4% in total value of loans, fisheries based project’s total share was just a paltry 0.6% in total value of loans, mixed farming based projects accounted for a paltry 0.2% in total value of loans while others based projects accounted for 1.5 % in total value of loans guaranteed. In the crops subsector, food crops based projects accounted for 43.6% in total value of loans while cash crop based projects accounted for a paltry 0.9% in total value of loans. Grains based projects were the most financed projects in the crop subsector and accounted for 30.7% in total value of loans followed by roots/ tubers which accounted for 12.9% in total value of loans. In the livestock subsector, poultry based projects were the most financed projects and accounted for 3.5% in total value of loans guaranteed by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme.

During the post-merger and acquisition consolidation policy era of the Nigerian banking institutions (2005-2014), the utilization percentage share of loans to different enterprises by value shows that crop based projects accounted for approximately 39.0% in cumulative value of loans, livestock based projects accounted for 8.6% in total value of loans, fisheries based project's total share was 2.1% in total value of loans, mixed farming based projects accounted for 1.3% in total value of loans while others based projects accounted for 1.4 % in total value of loans guaranteed. In the crops subsector, food crops based projects accounted for 37.8% in total value of loans (reduced by 5.8% from its percentage share in the pre-merger and acquisition consolidation policy era) while cash crop based projects accounted for a paltry 1.2% in total value of loans (increased by 0.3% from its percentage share pre-merger and acquisition policy era). Grains based projects were the most financed projects in the crop subsector and accounted for 22.8% in total value of loans (reduced by 7.8% from its percentage share in the pre-merger and acquisition consolidation policy era) while as in the livestock subsector, poultry based projects were the most financed projects and accounted for 6.1% in total value of loans guaranteed by the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme Fund (increased by 2.6% from its percentage share pre-merger and acquisition policy era). Livestock, fishery and mixed farming enterprises increased by 4.2%, 1.5% and 1.0% from their utilization percentage share in the pre-merger and acquisition consolidation policy era respectively while as crops and others enterprises reduced by 5.4% and 0.1% from their utilization percentage share in the pre-merger and acquisition consolidation policy era than during the post-merger and acquisition consolidation policy era of the Nigerian banking institutions (2005-2014). The result suggested that merger and acquisition consolidation policy of the Nigerian banking institution has a reallocation effect on the total value of loans granted to different agribusiness subsectors of the Nigerian economy. This might not be purposive on the part of the Nigerian banking institutions under the Agricultural Credit Guarantee Scheme Fund but however, established the fact that most poorly financed agribusinesses in Nigeria were made better off by the introduction of merger and acquisition consolidation policy in the Nigerian banking institutions. This result further suggested that under the scheme, credit was extensively rationed for crop based projects and intensively rationed in livestock, fish, mixed farming and others based projects. This might not be purposive on the part of the scheme but however, established the fact that small-scale individual borrowers dominated the crop based project while medium-scale cooperative and/or company borrowers dominated the livestock and fish subsectors. In credit schemes with extensive rationing, a large value of beneficiaries are targeted but with each beneficiary receiving a small amount [19]. Access to credit is the motive for implementing extensive credit rationing. Increase in access to credit with limited availability of credit will culminate into small loan sizing. According to [19], extensive credit rationing is indicative of poor loan sizing. The decrease in loan size on one hand may be an indication that the scheme wanted to reach more people and might not have reduced loan administration costs for the lending agencies as expected, a reason why most banks will refuse to participate in the scheme and colossal withdrawal of those already participating in the scheme [15]. On the other hand, decrease in loan size may be an indication that most of the crop based borrowers demand for small amount of loans which they can repay willingly because of the subsistence nature of their farming business or could be a predetermined amount for categories of agribusiness enterprises. Repayment of loan is the motive for implementing intensive credit rationing. Increase in loan repayment will culminate into increased returns for the lending agencies [15]. According to [7], lenders would like to identify borrowers most likely to repay their loans since the banks expected returns depend on the probability of repayment. In an attempt to identify borrowers with high probability of repayment, banks are likely to use the interest rate that an individual is willing to repay as a screening device [15]. This is likely to be reflected in higher loan amounts applied for and disbursed by the banks under the scheme to the borrowers after rationing out those who are not qualified, a justification for the larger amount of loan received by fewer loan beneficiaries in the livestock and fish subsectors in the pre and post-merger and acquisition consolidation policy of the Nigerian banking institutions.

Table 3 presents a comparison of the mean value and growth rate in government credit allocation to agribusiness activities, agribusiness output, number and value of bank's credit allocation to agribusiness sector in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions.

The t-student distribution test result for the mean value and growth rate in government credit allocation to agribusiness activities, agribusiness output, number of agribusiness enterprises and value of bank's credit allocation to agribusiness sector in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions is also presented in Table 3.

The mean value of government capital investment in agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy of the Nigerian banking institution were approximately ₦17.70 billion and ₦81.00 billion, respectively. There was a significant difference (t = - 5.148) in the mean value of government capital investment in agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions. The mean value of government capital investment in agribusinesses in Nigeria during the post-merger and acquisition consolidation policy in the Nigerian banking institutions was significantly higher than the mean value of government capital investment in agribusinesses in Nigeria in the pre-merger and acquisition consolidation policy in the Nigerian banking institution. This indicated that more concentration might have been given by government to agribusinesses in Nigeria due to banks' merger and acquisition consolidation policy. Similarly, variations existed in the average rate of growth of government capital investment in agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy of the Nigerian banking institution. The average growth rate of government capital investment in agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions was -17.47% and -3.78 respectively. The difference in the average mean growth rates of government capital investment in agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions was however not significant (t = -0.359).This indicated that the rate of government capital investment in agribusinesses in Nigeria had not been faster in any of the paired periods due to merger and acquisition consolidation policy. Therefore, government capital investment in agribusinesses in Nigeria showed homogeneity in growth. The mean quantity of agribusiness output varied with mean quantity of agribusiness output in the pre-merger and acquisition consolidation policy in the Nigerian banking institutions being about 50.60 billion grain equivalent (GE) while the mean quantity of agribusiness output during the post-merger and acquisition consolidation policy in the Nigerian banking institutions was about 83.20 billion grain equivalent (GE) There were significant differences (t = -9.264) in the mean agribusiness output in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions. The mean quantity of agribusiness output in Nigeria during the post-merger and acquisition consolidation policy in the Nigerian banking institutions was significantly higher than the mean quantity of agribusiness output in Nigeria in the pre-merger and acquisition consolidation policy in the Nigerian banking institution.

Table 3. Test of significance of the difference between the mean value and growth rate in government credit allocation to agribusiness activities, agribusiness output, number and value of bank's credit allocation to agribusiness sector in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions

SAMPLES	MEAN	STD.DEVIATION	STD.ERROR MEAN	D.F	T-STATISTIC
MEAN VALUE OF GOVERNMENT CAPITAL INVESTMENT IN AGRIBUSINESSES, AGRICULTURAL OUTPUT, AND NUMBER AND VALUE OF LOANS (₦ BILLIONS)					
^{A}GCIAPREMAP	17.70	18.60	5.88		
^{B}GCIADMAP	81.00	26.59	8.41		
DIFFERENCE (A-B)	-63.30	38.88	12.30	9	-5.148***
^{A}AQT PREMAP	50.60	4.43	1.40		
^{B}AQT DMAP	83.20	15.07	4.77		
DIFFERENCE (A-B)	-32.60	11.13	3.52	9	-9.264***
^{A}NUMLOANS PREMAP	2,053.20	584.17	184.73		
^{B}NUMLOANS DMAP	5,247.90	861.88	272.55		
DIFFERENCE (A-B)	-3,194.70	641.70	202.92	9	-15.743***
^{A}VLOANS PREMAP	646.90	622.94	196.99		
^{B}VLOANS DMAP	8,138.90	2,607.24	824.48		
DIFFERENCE (A-B)	-7,492.00	2,186.44	691.41	9	-10.836***
MEAN GROWTH RATE OF GOVERNMENT CAPITAL INVESTMENT IN AGRIBUSINESSES, AGRICULTURAL OUTPUT, AND NUMBER AND VALUE OF LOANS (%)					
^{A}GCIA PREMAP	-17.47	109.79	36.60		
^{B}GCIA DMAP	-3.78	32.65	10.88		
DIFFERENCE (A-B)	-13.69	114.47	38.16	8	-0.359
^{A}AQT PREMAP	2.89	5.10	1.70		
^{B}AQT DMAP	5.93	0.42	0.14		
DIFFERENCE (A-B)	-3.04	5.07	1.69	8	-1.800
^{A}NUMLOANS PREMAP	4.83	19.49	6.50		
^{B}NUMLOANS DMAP	4.12	12.51	4.17		
DIFFERENCE (A-B)	0.71	25.79	8.60	8	0.082
^{A}VLOANS PREMAP	22.29	19.90	6.63		
^{B}VLOANS DMAP	-3.76	47.65	15.88		
DIFFERENCE (A-B)	26.05	53.99	18.00	8	1.447

Source: Computed by the author from CBN (2014) Annual Report and Statement of Accounts for the year Ended 31st December, 1995-2014. PreMAP = Pre-merger and acquisition consolidation policy of Nigerian banking institutions; DMAP = During post-merger and acquisition consolidation policy of Nigerian banking institutions; GCIA = government capital investment in agribusinesses; AQT agribusiness output; Numloans = number of loans and Vloans = value of loans. *** = represents 1% level of significance.

This indicated that the mean quantity of agribusiness output in Nigeria increased more between 2005 and 2014 due to merger and acquisition consolidation policy in the Nigerian banking institutions.

Therefore, merger and acquisition consolidation policy in the Nigerian banking institution enhanced agribusiness output performance in Nigeria. Similarly, variations existed in the average rate of growth of agribusiness output in Nigeria in the pre and post-merger and acquisition consolidation policy of the Nigerian banking institution. The average growth rate of agribusiness output in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions was 2.89% and 5.93% respectively. The difference in the average mean growth rates of agribusiness output in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions was not significant (t = -1.800). This indicated that the rate of growth in agribusiness output in Nigeria had not been faster due to merger and acquisition consolidation policy in the Nigerian banking institutions. Therefore, agribusiness output in Nigeria showed homogeneity in growth in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions. This findings compliment [3] who also reported that growth rate of agricultural output was slow. The non-significance of the difference in the mean growth rates of agribusiness output in the pre and post-merger and acquisition consolidation policy, suggested that the rate of investment in the sectors was not significantly higher as a result of the merger and acquisition consolidation policy. The mean numbers of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institution were 2,053.2 farmers and 5,247.9 farmers respectively. There was a significant difference (t = -15.743) in the mean number of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institution. This indicated that the mean number of loans granted to agribusinesses in Nigeria increased more between 2005 and 2014 due to merger and acquisition consolidation policy in the Nigerian banking institutions. This indicated that more farmers had access to credit from banks in Nigeria during the post-merger and acquisition consolidation policy in the Nigerian banking institution. Therefore, merger and acquisition consolidation policy in the Nigerian banking institution enhanced the number of loans granted to agribusinesses in Nigeria. Similarly, variations existed in the average rate of growth of number of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy of the Nigerian banking institution (Table 4.8). The average growth rates in the numbers of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy were 4.82% and 4.12% respectively. The difference in the average mean growth rates of number of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions was not significant (t=0.082). This indicated that the rate of growth in number of loans granted to agribusinesses in Nigeria had not been faster due to merger and acquisition consolidation policy in the Nigerian banking institutions. Therefore, number of loans granted to agribusinesses in Nigeria showed homogeneity in growth in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions. The mean value of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institution were ₦ 646.90 billion and ₦8, 138.9 billion respectively. There was a significant difference (t = -10.836) in the mean value of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institution. This indicated that the mean value of loans granted to agribusinesses in Nigeria increased more between 2005 and 2014 due to merger and acquisition consolidation policy in the Nigerian banking institutions. This indicated that more farmers had access to credit from banks in Nigeria during the post-merger and acquisition consolidation policy in the Nigerian banking institution. Therefore, merger and acquisition consolidation policy in the Nigerian banking institution enhanced the value of loans granted to agribusinesses in Nigeria. Similarly, variations existed in the average rate of growth of value of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy of the Nigerian banking institution (Table 4.8). The average growth rate value of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions were 22.3% and -3.76% respectively. The difference in the average mean growth rates of value of loans granted to agribusinesses in Nigeria in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions was not significant (t = -1.447). This indicated that the rate of growth in value of loans granted to agribusinesses in Nigeria had not been faster due to merger and acquisition consolidation policy in the Nigerian banking institutions. Therefore, value of loans granted to agribusinesses in Nigeria showed homogeneity in growth in the pre and post-merger and acquisition consolidation policy in the Nigerian banking institutions.

CONCLUSIONS

The merger and acquisition consolidation policy in Nigerian banking institutions has influenced the participation and accessibility of many smallholder agribusiness operators to credit facilities for production purposes. However, credit rationing characterized credit allocation behaviour of Nigerian banking institutions. This plays a mammoth role in the definition of the pattern of growth in the number and value of loans guaranteed to different sub-sectors in the agribusiness sector. The mean value of government capital investment in agribusinesses, agribusiness output, number and value of loans allocated to agribusiness enterprises was significantly higher during the post-merger and acquisition consolidation policy era in the Nigerian banking institutions than in the pre-merger and acquisition consolidation policy era. We had the same growth rate in government capital investments, agribusiness output, number and value of loans allocated to agribusiness enterprises in the pre and post-merger and acquisition consolidation policy era. More farmers had access to credit from banks in Nigeria during the post-merger and acquisition consolidation policy era in the Nigerian banking institution.

Finally, Merger and acquisition consolidation policy in the Nigerian banking institution enhanced the number of loans granted to agribusinesses in Nigeria.

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THE RELATIONSHIP BETWEEN CAPITAL FLIGHT AND POVERTY: THE CASE OF NIGERIA

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Abstract

The study investigated the relationship between capital flight and poverty in Nigeria. The time series data spanning from 1986 to 2014 was analyzed using Johansen co-integration test and error correction model. The Johansen co-integration results revealed that a long run equilibrium relationship exist between capital flight and poverty (proxied by discomfort index) in Nigeria. Similarly, the error correction term showed that the present value of discomfort index (a proxy for poverty) adjusted rapidly to changes in capital flight, real exchange rate, real gross domestic product growth rate and adult literacy rate by approximately 66.82 percent in the long run. On the other hand, capital flight had a positive relationship with discomfort index (a proxy for poverty). Similarly, real gross domestic product (GDP) growth rate and adult literacy rate related positively with discomfort index. Among other things, it was recommended inter alia that government should lift the stringent penalties due to money launderers in order to encourage repatriation of their investments, coupled with strict policies aimed at preventing and checking further siphoning of national wealth.

Key words: *capital flight, discomfort index, poverty*

INTRODUCTION

Over the years, Nigeria have been known and described as the giant of Africa given her wealth of natural resources and large economy which is predominantly hinged on large foreign exchange revenue emanating from the export of crude oil. With such wealth of resources, one would expect an average Nigerian to be swimming in a pool of economic comfort. Paradoxically, however, the reverse is the case. Poverty have been a problem for a large proportion of the population in the past decades, with surges over 60 percent (Daniel, 2011, and National Bureau of Statistics, 2014) [9]. Consequently, a natural question that arises is; why is Nigeria experiencing high rate of poverty and economic discomfort amidst her wealth of resources? To answer this question, researchers have identified several factors that drive poverty and economic discomfort such as, high unemployment rate, inflation, political instability, corruption, low level of savings, unfavourable investment climate, high level of illiteracy and low productivity (Daniel, 2011; and Onyedikachi and Chinweoke, 2013) [9, 28]. However, an important factor that have been largely neglected in the literature is the leakage of financial resources by way of capital flight.

Globally, capital flight represents a problem not only for economists, policy decision makers, government, financial experts, but also, for the welfare of common people in developing countries of the world. Going through the literature, there is no universally accepted definition of capital flight. As such, the definitions in the literature are as varied as the authors both in conceptual terms and their coverage of sectors, assets and data availability. While some authors chose to refer all outflows of capital as capital flight, others opined that it was only a fraction of all outflows (Boyrie, 2010, Waleru, 2013, Ndiaye, 2014 and Ndikumana, *et al.*, 2014) [6, 18, 20, 37]. Nevertheless, the phenomenon known as “capital flight” specifically refers to the exodus of financial resources from investments in one country to another so as to avoid country-specific risks such as, political upheaval, high rate of inflation, fear of confiscation and exchange rate volatility (Hermes & Lensik, 2001, Saheed & Ayodeji, 2012; Onoja, 2015, Uremadu *et al.*, 2016) [12, 31, 26, 36].

Literature abound that capital flight can be legal or illegal (Okoli, 2006) [24]. The legal perspective of capital flight is normally fleeing to safety and is expected to return to its country of origin when investment climate becomes attractive and rewarding. As such, the legal component is generally after-tax money, properly documented and remaining on the books of the entity from which it is transferred. There are ample evidences that such flows are often repatriated (Baker, 2000) [4]. Conversely, the illegal component is fleeing to secrecy to be accumulated secretly. As such, private bankers can rarely attest return to the country of origin (Baker, 2000) [4]. The illegal flight is improperly documented, following falsified transactions and it disappears from any record in the country of origin. The illegal perspective of the subject connotes money from activities such as money laundering, tax evasion, racketeering, child trafficking, drug trafficking, and the rest of them. Nevertheless, capital flight, in whatever form it appears would negatively affect capital formation in a capital scarce economy be it legal or illegal (Brada *et al.*, 2008; Adaramola & Obalade, 2013) [7,1].

According to Onyedikachi & Chinweoke (2013) [28], impaired access to capital resources explains poverty as the incapacity of gaining access to agricultural land, physical capital and financial assets; exposes the populace to impaired income level, unemployment and underemployment, undernourishment, and the rest of them. Generally, impaired access to resources shifts the focus on poverty and curtails the capability of an individual to convert available productive resources to a higher quality of life (Sen, 1997) [32]. Similarly, poverty can also be the outcome of inefficient use of common resources and wastages. This may result from capital flight due to weak policy and investment environment which results to inadequate infrastructure, weak access to technology, credit crunch, low domestic product and the end result being increased economic discomfort. As such, massive capital flight from a developing economy will further accelerate economic discomfort which manifests itself in upsurge of poverty among residents of the country as scarce domestic resources are allowed to freely flow abroad through legal and illegal routes.

Surprisingly, Nigeria with endowment of abundant human and natural resources, the sixth largest oil producer with more than 3.5 million barrels of crude oil output per day is enlisted among the most corrupt countries of the world, whose citizens suffer from high rate of poverty (African Development Bank and Global Financial Integrity, 2010 and Waleru, 2013) [2, 37]. Similarly, Kale (2012) [16] asserted that poverty in Nigeria is a paradox – despite the fact that Nigeria’s economy have continued to grow, the proportion of Nigerians living in poverty have accelerated every year. With the rate of almost $10 billion annual loss to capital flight Nigeria will remain in the snares of acute poverty, unless such capital flights are repatriated (Adaramola & Obalade, 2013) [1]. It was also reported that Nigeria is among many African economies that have experienced low savings and investments as a result of capital flight (Ndiaye, 2014; Raheem & Adeniji, 2015) [20, 30]. Such low level of investments due to high rate of capital flight in Nigeria also have multiplier effect on other aspect of the economy, including the rate of unemployment, poor standard of education, fiscal deficit, low infrastructures, as well as pronounced regressive effect on resource allocation (Uguru, 2016) [33].

Following the austerity theory, the poor undergo much distress due to capital flight. This is because they are exposed to excruciating austerity measures (such as, spending cuts, tax increases, or a mixture of both) by government with the aim of reducing budget deficit (Pastor, 1990) [29]. As such, poverty in developing countries reduces them to hewers of wood and drawers of water, while perpetrating international inequality and dependency and widening the gap between the rich countries and poor countries.

Therefore, a vicious circle of capital flight, fiscal deficit, poor economic growth, and poverty is created. Furthermore, the tax that the poor may pay is small, which again constrains the ability of government to muster enough resources to promote growth and poverty alleviation schemes. Consequently, with the upsurge of this economic epidemic known as capital flight, the government will resort to incurring more external debt to fill the fiscal gap which will further propel more flight of capital due to debt servicing (Beja, 2006) [5].

Consequently, bearing in mind that the effect of capital flight can be threatening to economic growth and development, this study proceeded to explore the factors identified in the literature to account for capital flight, and how such factors have influenced poverty (proxied by discomfort index) in Nigeria. The sole objective of this paper, is to specifically test the influence of capital flight on poverty in Nigeria as detailed by the austerity theory. The findings there from offered explanations to the dynamics of capital flight in developing economies, with emphasis on Nigeria. At the end, suggestions aimed at abating the problem of capital flight in Nigeria was made to policy makers.

Empirical literature

Uguru (2016) [33] studied the effect of capital flight on tax revenue in Nigeria using ordinary least squares (OLS) model was employed based on time series data quantifying capital flight under the hot money or balance of payment approach. It was found that a unit increase in capital flight caused a 2 percent decrease in tax revenue in Nigeria.

Uremadu *et al*., (2016) [36], examined the effect of capital flight on financial savings in Nigeria. The results showed that capital flight exerted a negative and significant effect on financial savings. It was recommended *inter alia* that investments be directed and focused on infrastructural development and the real sectors of the economy in order to accelerate the level of capital formation, induce further growth of both private and foreign investments which would equally generate additional savings for further investments in the long run.

Obidike *et al.,* (2015) [23], investigated the impact of capital flight on the economic development in Nigeria. They adopted Autoregressive Distributed Lagged model (ARDL). The result of the model showed that capital flight had a negative and significant impact on economic development. It was recommended *inter alia* that government should take concerted steps to improve security of lives and properties in the country because security lapses constitute threat to business activities.

Onoja (2015) [26], examined the dynamic effect of capital flight on real exchange rate of the naira, using quarterly times series data covering the period of 1981-2009. Specifically, the study investigated if a long-run relationship existed between real exchange rate and capital flight in Nigeria. The study found that capital flight had no significant effect on real exchange rate, even at 10 percent level of significance.

Raheem and Adeniyi (2015) [30], examined both the total effect and the individual effects of the sources of capital inflow (foreign direct investment), official development assistance (ODA), remittances and debt, as well as capital outflow (capital flight) on economic growth for 33 countries in Sub-Saharan Africa (SSA) from 1970 to 2010. Using system generalized method of moments (Sys-GMM), the findings indicated that capital flight and debt constituted significant drags on growth. The key policy implication drawn from the results was for policy makers to design policies that will ensure investment friendly environment.

Olawale and Ifedayo (2015) [25], examined the impact of capital flight on economic growth in Nigeria using time series data from 1980 to 2012. The results showed that capital flight, foreign reserve, external debt, foreign direct investment and current account balance co-integrated with gross domestic product (GDP) in Nigeria. It was also discovered that capital flight had a negative impact on the economy. Based on the empirical findings, it was recommended that the government should create an enabling environment for profitable investments in order to reduce the incidence of capital flight in Nigeria.

Dim and Ezenekwe (2014) [10], examined capital flight and savings gap, underscoring the socio-economic determinants of capital flight in Nigeria. Among the variables included in the model, only lagged capital flight, fiscal balance and exchange rate were found to be significant in influencing capital flight in the country. The study therefore concluded *inter alia* that unless sound macroeconomic measures were taken to address these factors, capital flight would continue to paralyze economic activities in Nigeria.

Ndiaye (2014) [20], examined the effect of capital flight on economic growth in the Franc Zone (FZ). For the period 1970 to 2010, real capital flights from these countries were found to be positive and massive with a magnitude of roughly US$86.8 billion (with the Adjusted World Bank method) or US$80.1 billion (with the Adjusted Morgan Guaranty method). At the same time, the FZ countries experienced low and very volatile investment and growth rates. The econometric analysis showed that capital flight significantly reduced economic growth in the FZ countries.

Ndikumana (2013) [9], examined the implications of capital flight and tax havens for economic development in African economies. Specifically, the paper investigated the impact of capital flight on domestic investments and the opportunity costs of capital flight in terms of forgone growth. From the results, it was concluded that capital flight had a negative and statistically significant effect on domestic investments and that this effect holds even when other important determinants of investments were accounted for in the specification.

Onyedikachi & Chiweoke (2013) [28] studied on poverty and economic growth in Nigeria for the period, 1990 – 2011. The empirical results from the regression model, though contrary to economic expectations, showed a zero–correlation between poverty, discomfort index and economic growth in Nigeria. None of the parameter estimates of Human Development Index (HDI) and Discomfort Index was statically significant in explaining economic growth in Nigeria. The result was attributed to poor attitude of the government towards human capital development.

Saheed & Ayodeji (2012) [31], employed the ordinary least square (OLS) method to analyze the secondary data obtained from Central Bank of Nigeria (CBN), and National Bureau of Statistics (NBS). The findings showed that capital flight had a positive and statistically significant impact on the exchange rate in Nigeria over the period studied.

Azziz *et al.,* (2014) [3], investigated the determinants of capital flight from Bangladesh using times series data from 1973 to 2013. Linear regression model was used and the method of ordinary least squares (OLS) function was applied to estimate the indicators of capital flight. It was identified that external debt, foreign direct investment, and foreign reserves to be the main causes of capital flight. Statistically, they proved that external debt was the major cause of capital flight from Bangladesh, and concluded that proper and efficient external debt management and utilization would be key strategy to combat the problem.

MATERIALS AND METHODS

With the sole objective of investigating the relationship between capital flight and poverty in Nigeria, *ex post facto* research design was used. By definition, *ex-post facto* study is a category of research design in which the investigation starts after the fact had occurred without interference from the researcher. The data set comprises of annual time series spanning from 1986 to 2014.

The method of inferential statistics was adopted for the analysis of data, and it involved the statement and testing of hypothesis. The model specified for this study was adopted from the empirical literature reviewed, specifically, Onyedikachi & Chinweoke (2013), and Raheem & Adeniji, (2015) with some modifications [28, 30]. The model was specified in multivariate form as follow:

$$DCI = \beta_0 + \beta_1 KF + \beta_2 RER + \beta_3 RGDP + \beta_4 ADLT + e \ldots\ldots\ldots\ldots Eqn\ (1)$$

The *a priori* expectations of the model are *ceteris paribus*:

$\beta_1 > 0; \beta_2 > 0; \beta_3 >< 0; \beta_4 < 0;$

where,
β_0 = Constant
β_1 - β_4 = Population parameters
DCI = Discomfort index (a proxy for poverty)
KF = Capital flight
RER = Real exchange rate
RGDP = Real gross domestic product growth rate
ADLT = Adult literacy rate
e = Estimated error term

Description of Research Variables

The variables (both dependent and independent) relevant for this study are briefly explained below.

Dependent Variable

(i)Discomfort Index (DCI): According to Oswald (2001) [27], economic discomfort (or misery index) is an economic indicator used to determine how the average citizen is doing economically. The assumption here is that both unemployment and inflation creates both economic and social costs for a country. As such, some studies have used this index to measure poverty (i.e. Onyedikachi & Chiweoke, 2013) [28]. As proposed by Arthur Okun, economic discomfort is computed thus:

$$DCI = UNMPR + INFR \qquad \text{. . . . .Eqn (2)}$$

where,
DCI = Discomfort index
UNMPR = Unemployment rate
INFR = Inflation rate

Independent Variables

(a)Capital Flight (KF): Capital flight denote the massive outflow of domestic resources from less developed countries to the developed countries. Theoretically, this phenomenon causes a negative effect on savings, investments and economic growth (Uremadu, *et al.*, 2016) [36]. Hence, with the persistent outflow of resources, the domestic economic performance will deteriorate significantly, with poverty rate on the increase. Capital flight was computed using the residual (World Bank, 1985 and Guaranty Trust Company, 1986) [17].

$$CFN = \Delta EXD + NFDI - (\Delta RSV + CAD) \text{.....} \text{..Eqn (3)}$$

Note: Capital flight was expressed as a ratio of real gross domestic product for the analysis.

(b)Real Exchange Rate (RER): Real exchange rate reflects the summary measure of the price of a country's product relative to those of other countries. Real exchange rate as an indicator of capital flight represents the notion that currency depreciation reduces purchasing power. Hence, capital flight arises as investors seeks to channel their investments cum savings abroad for higher returns due to depreciation of domestic currency (Saheed and Ayodeji, 2012; Onoja, 2015) [31, 26]. The real exchange rate between foreign countries *i* and the home country at time *t* is computed as follows:

$$RER_{i,t} = e_{i,t} \times \frac{P_t}{P^*_{i,t}} \qquad \text{. . . . . .Eqn (4)}$$

where,
p is the price level of the home country, p^*i is the price level in foreign country i, and e_i is the nominal exchange rate between the currencies of foreign country i and the home country, expressed as the number of foreign currency units per home currency unit so that e_i rises with an appreciation of the home-country currency.

(c)Real Gross Domestic Product: This is a measure of a nation's economic growth from one period to another. By definition, it is the monetary value of aggregate goods and services produced in Nigeria. Higher monetary values denote that domestic production is increasing, while lower values denote a decrease in domestic output. Hence, a negative growth rate will accelerate poverty rate and economic discomfort due to lack of goods and services for consumption and further generation of income in the economy (Ndiaye, 2014) [20].

(d)Adult Literacy Rate: This variable was computed as the ratio of educated adults to total population. High rate of adult illiteracy can cause economic discomfort (i.e. unemployment, low income, corruption and other social vices) by reducing the level of skilled labour and the labour force as a whole (Onyedikachi & Chiweoke, 2013) [28]. As such, high rate of unemployment becomes prevalent, and as poverty and economic discomfort persistently increase. As a result, the educated ones who couldn't secure gainful employments domestically resort to travelling abroad for better employment opportunities; leading to a phenomenon known as brain drain or human capital flight (Collier *et al.*, 2003) [8].

RESULTS AND DISCUSSIONS

The results obtained from the tests and data analysis were presented in Tables 1, 2, 3, 4, 5, and 6. These results includes the descriptive statistics, unit root test, co-integration test, error correction model and other diagnostic tests.

Descriptive Statistics

Prior to the econometric analysis, a brief description of the data set was given. The descriptive statistics was used to describe the basic features (i.e. mean, standard deviation, maximum and minimum numbers) of the data set collated from Central Bank of Nigeria statistical bulletin, National Bureau of Statistics, Saheed and Ayodeji (2012) [31], Onyedikachi and Chinweoke (2014) [28], International Financial Statistics and Global Financial Integrity (2008, 2013) [2]. The output from the descriptive statistics was presented in Table 1 below.

Table 1. Summary of Descriptive Statistics

	DCI	ADLT	RGDP	KF	RER
Mean	31.525	34.508	5.2050	158.14	109.85
Maximum	74.610	79.000	17.592	647.21	272.37
Minimum	10.540	10.300	-0.8214	0.0200	49.730
Std. Dev.	17.439	17.075	3.9441	195.14	60.455

Source: Authors Computations (2016) using Eview 8.0

The mean values in Table 1 shows that on average capital flight (KF) to real gross domestic product (RGDP) ratio was 158.14 percent, followed by real exchange rate (RER) 109.85 percent, adult literacy (ADLT) 34.508 percent, discomfort index (DCI) 31.525 percent and real gross domestic product (RGDP) growth rate (5.2050 percent).

Going through the mean of these variables, it can be observed that capital flight, discomfort index, adult literacy and real exchange are increasing at an alarming rate, while the low average of real gross domestic product growth rate shows that the Nigerian economic growth is slow.

The results also shows that discomfort index reached its maximum rate of 74.610 percent in 1995 and its minimum level was 10.540 in year 2000. Adult literacy rate was high in 1995 at 79 percent and decreased to 10.30 percent in 2007. Real GDP growth rate shows that the Nigerian economic performance have been poor, increasing from -0.8214 in 1991 to 17.592 percent in 2002 compared to its average of 5.2050 percent.

On the other hand, the maximum value of capital flight to real GDP ratio shows that capital flight was increasing faster than domestic production. Capital flight to real GDP ratio recorded a minimum of 0.02 percent in 1997, by 2007 (10 years after) it reached its maximum value of 647.21 percent. Similarly, real exchange rate hit its highest rate in ₦272.37/$1 in 1998, while the lowest rate of ₦49.73/$1 was experienced in 1992 denoting that the Naira have been depreciating significantly.

The standard deviation of the variables shows that capital flight to real gross domestic product ratio was highly volatile with an index point of 195.14, followed by real exchange rate (60.455), discomfort index (17.439), adult literacy (17.075) and real gross domestic product growth rate (3.9441) percent.

Augmented Dickey-Fuller Unit Root Test

This is the test of non-stationarity under time series variables in order to avoid spurious regression results.

Unit root tests are carried out on the individual variables in isolation; that is, it does not take into account any relationship that might be between the variables being tested and any variable selected to be in the model.

The study employed the Augmented Dickey – Fuller (ADF) tests presented in Table 2.

Table 2. Augmented Dickey Fuller (ADF) Test Results

Variables	**ADF @ Level**	**ADF @ 1^{ST} Difference**	**Decision**
DCI	-3.122884	-3.922354**	I(1)
KF	-2.683383	-5.755046***	I(1)
RER	-3.566754	-6.022959***	I(1)
RGDP	-3.233070	-7.201810***	I(1)
ADLT	-1.758872	-4.458024***	I(1)

Source: Authors Computations (2016) using E-views 8.0

Table 2 shows the unit root test results for the variables used in the analysis. The test was conducted using the Augmented Dickey Fuller (ADF) model. The results indicates that all the variables in the model were integrated of order one. Consequently, after taking the first differences of all the variables they became stationary. These results implies that the regression results that would be obtained from the model earlier specified would return a spurious result if there is no long-run relationship among the variables in the model. Hence, the need to ascertain the long run relationship using co-integration test.

Co-integration Test

Co integration is the statistical implication of the existence of long run relationship between the variables which are individually non-stationary at their level form, but stationary after difference (Gujarati, 2004) [11]. The Johansen test of co-integration uses the likelihood ratio to test for co-integration. Up to (r-1) co-integrating relationships may exist between a set of r variables. The hypothesis of co-integration is accepted if the number of co-integrating relationships is greater than or equal to one. If the likelihood ratio is greater than the critical value, the hypotheses of co-integration is accepted, if not it is rejected in favour of the null hypothesis of no co-integration. The co-integration results are presented in Table 3 below.

The results of the Johansen co-integration tests are as presented in Table 3. The results shows that the null hypothesis of no co-integration, that is 0 can be rejected using either max-eigen or trace tests statistics.

Table 3. Johansen Co-integration Test Results

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
None *	135.62	69.818	62.363	33.876
At most 1*	73.259	47.856	32.196	27.584
At most 2*	41.062	29.797	29.197	21.131
At most 3	11.865	15.494	8.5706	14.264
At most 4	3.2946	3.8414	3.2946	3.8414

Source: Computed by Authors (2016) Using E-view 8.0

The max-eigen and trace tests are both greater than their respective critical values. Consequently, these test results indicate that, discomfort index is co-integrated with the measures of capital flight, real exchange rate, adult literacy and real gross domestic product growth rate. After ascertaining that the variables are co-integrated, the error correction model (ECM) was used to capture the short run and long-run behaviour of the variables used in the study.

Error Correction Model

Given that a co-integrating relationship is present among the selected variables at level, an error correction model (ECM) model can be estimated, that is, a model that combines both the short-run properties of the economic relationships as well as the long-run information. The error correction model results are presented in Table 4.

From Table 4, capital flight (KF) and real exchange rate (RER) are in line with *a priori* expectation, while adult literacy rate (ADLT) which was expected to be negative surprisingly assumed a positive coefficient. However, real gross domestic product was expected to have either positive or negative coefficient depending the rate of growth.

The error correction term – ECM (-1) which has the expected negative sign, is significant at 1 percent with absolute value of 0.668218. The implication of this is that there is convergence in the long run, as was earlier revealed by the co-integration test. The coefficient indicates that the speed of adjustment from the short-run to the long-run is high, such that about 66.82 percent errors made in the previous year were corrected in the current year. This implies that the present value of discomfort index adjusted rapidly to changes in capital flight, real exchange rate, real GDP growth rate and adult literacy rate by approximately 66.82 percent in the long run.

Table 4. Error Correction Model Results

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(KF)	0.0179	0.0079	2.2707	0.0357
D(RER)	0.0279	0.0281	0.9949	0.3330
D(ADLT)	1.0456	0.1015	10.295	0.0000
D(RGDP)	0.8524	0.3118	2.7338	0.0136
C	1.6479	1.1422	1.4427	0.1663
ECM(-1)	-0.6682	0.1429	-4.6741	0.0002
R-squared	0.8714			
Adjusted R-squared	0.8357			
F-statistic	24.400			
Prob(F-statistic)	0.0000			

Source: Computed by Authors (2016) Using E-view 8.0

With respect to the general significance of the explanatory variables, the adjusted R-squared value implies that about 83.57 percent change in one period lag of discomfort index are explained by the variations in explanatory variables, denoting that the regression has good fit and is reliable. The F-statistic- a measure of the overall significance of the regression, shows that the explanatory variables are significant at the 1 percent level.

The constant (C) suggests that if all the explanatory variables (KF, ADLT, RER and RGDP) are held constant, poverty (proxied by discomfort index) in Nigeria will increase by approximately 164.79 percent. However, judging from the P-value (0.1668), the constant is not significant at 5 percent and even 10 percent level.

Discussion of Findings and Hypothesis Testing

The only hypothesis to be tested in this study is as stated in null form below.

Ho_1: Capital flight have no significant relationship with discomfort index in Nigeria.

The results presented in Table 4 suggest that capital flight fuelled poverty (proxied by discomfort index) in Nigeria. The coefficient of capital flight shows that 1 percent increase in one period lag of capital flight caused discomfort index (a proxy for poverty) to increase by 1.796 percent. This is in line with the austerity thesis of capital flight which holds that the poor suffer due to austerity measures by government to pay for debt obligations emanating from fiscal deficit. Again, it is also in line with *a priori* expectation that capital flight will increase economic discomfort (a proxy for poverty) by draining domestic resources. Again, other empirical literature that lend support to this finding are (Uguru, 2016, Azziz *et al.*, 2014, Ndikumana, 2013, and Ndiaye, 2009) [33, 3, 19, 21]. These resources, if available domestically will be used to salvage the economic welfare of Nigerian citizens. Judging from the P-value (0.0357) of capital flight which is less than 5 percent, the null hypothesis was rejected in favour of the alternative hypothesis that "capital flight have a significant relationship with poverty (proxied by discomfort index)". Hence, it was concluded that the austerity theory of capital flight have a force to bear in Nigeria given the results obtained for the study.

With regards to adult literacy, discomfort index (a proxy for poverty) increased by approximately 104.56 percent due to 1 percent increase in one period lag of adult literacy rate. This relationship is significant at 1 percent level. As such, it lends support to the findings of Onyedikachi & Chinweoke (2013) [28] who concluded that adult literacy had an adverse effect on economic growth in Nigeria. Such negative effect from adult literacy rate to economic growth could be a plausible reason for the result obtained in this study that adult literacy rate fuelled economic discomfort index (a proxy for poverty). Also, coupled with the limited employment opportunities and economic instability prevalent in Nigeria, the educated ones seek for employment opportunities in developed countries with better offers than Nigeria, hence, degenerating to brain drain (Collier e*t al.*, 2003) [8]. The implication of this finding is that changes in adult literacy rate low in Nigeria.

Also, from Table 4, one period lag of real gross domestic product growth rate caused discomfort index (a proxy for poverty) to increase by approximately 85.24 percent due to changes in domestic output of goods and services. This implies that due to low domestic production, economic discomfort (that is, poverty) increases as a result of lack of goods and services for domestic consumption. Literature abound that low GDP growth rate in Nigeria is a function of high rate of capital flight (Umoru, 2013, Ajayi 2014 and Obidike *et al.*, 2015) [35, 23]. As a result, exports reduce drastically and demand for imports increases. As such, domestic resources will be used to pay for such imported goods which have accounted for the depreciation of the Naira and high inflation in Nigeria. Also, over-reliance on crude oil for export earnings have not been encouraging due to the volatility of oil prices in the international market, especially in recent times.

Finally, the coefficient of real exchange rate suggests that a positive relationship exist between real exchange rate and economic discomfort index. This implies that, a 1 percent increase in one period lag of real exchange rate will cause economic discomfort to increase by approximately 2.79 percent. Literature such as Saheed and Ayodeji (2012) [31], Uguru *et al.*, (2014) [34] and Onoja (2015) [26] concluded that a positive relationship exist between capital flight and exchange rate, which lends support to the findings of this study. However, judging from the P-value (0.3330) real exchange is not significantly different from zero. This implies that in the short run, the real exchange rate does not influence economic discomfort (a proxy for poverty) in Nigeria. Rather other factors such as capital flight, real gross domestic product and adult literacy rate as earlier explained drive poverty (as proxied by discomfort index) in Nigeria.

Stability tests

According to Jason and Waters (2002) [14], most statistical tests are based on certain assumptions about the variables used in the analysis. When these assumptions are not met, the results may not be trustworthy resulting to a type 1 or type 2 error. Consequently, the tests to be carried out under the stability tests include serial correlation, normality, and multicollinearity tests. These tests results are summarized in Tables 5 and 6, respectively.

Normality and Serial Correlation Tests

Regression assumes that variables have normal distributions. Non-normally distributed variables can distort relationships and significance tests (Jason and Waters, 2002) [14]. Consequently, to test for normality of the data set, the Jarque-Bera statistic was employed. If the data comes from a normal distribution the Jarque-Bera test has a chi-squared distribution with two degrees of freedom, so the statistic can be used to test the hypothesis that the data set are normally distributed (Jarque and Bera, 1987) [13].

On the other hand, autocorrelation refers to the existence of a relationship between error terms across observations of a time series (Noula, 2013) [22]. In this study, autocorrelation was tested using the Breusch-Godfrey serial correlation LM test. The decision rule is to accept H_o if the probabilities of the F-statistic and the observed R^2 are greater than 0.05, which depict the absence of auto correlation and vice versa.

The Jarque-Bera test in Table 5 indicates the acceptance of the null hypothesis that the errors are normally distributed given its P-value (0.978249).

Table 5. Tests Results for Normality and Serial Correlation

Jarque-Bera Normality Test	**Prob.**	**Breusch Godfrey Serial Correlation LM Test**	**Prob.**
Jarque-Bera 0.043982	0.978249	F-statistic 2.472440	0.1160
		Obs* R-Squared 5.6665165	0.0588

Source: Authors Eview Output (2016)

Similarly, judging from the test results presented above, the probabilities of both the F-statistic (0.1160) and the observed R-squared (0.0588) are greater than 0.05. Therefore, the null hypothesis (Ho) was not rejected, implying that autocorrelation is absent.

Multicollinearity Test

Multicollinearity is a high degree of correlation (linear dependency) among two or more independent variables. It commonly occurs when two or more independent variables are incorporated in a regression model. It is because some of them may measure the same concepts or phenomena. Multicollinearity inflates the variances of the parameter estimates and hence this may lead to lack of statistical significance of individual predictor variables even though the overall model may be significant (Joshi, 2012) [15]. A common method of testing for multicollinearity is the use of variance inflation factor (VIF) which quantifies the severity of multicollinearity in an ordinary least- squares regression analysis. The VIF is calculated thus.

$$VIF = 1/\,(1- R^2) \qquad \text{..........................} Eqn\ (4)$$

where,
VIF = Variance inflation factor
R^2 = Adjusted coefficient of determination

Rule of Thumb: If the VIF exceeds 10, it implies that the associated regression coefficients are poorly estimated because of multicollinearity (Joshi, 2012) [15].

The VIF results are presented in Table 6 below.

Table 6. Summary of Variance Inflation Factor (VIF) Results

Variable	**Coefficient Variance**	**Uncentered VIF**	**Centered VIF**
D(ADLT)	0.010314	1.104106	1.101781
D(RGDP)	0.097229	1.284952	1.273437
D(KF)	6.26E-05	1.370411	1.367177
D(RER)	0.000790	1.334222	1.330674
C	1.304718	1.018161	NA
U(-1)	0.020438	1.344757	1.344708

Source: Authors Eview Output (2016)

Since none of the VIFs on Table 6, are not greater than 10, it was concluded that multicollinearity is absent. As such the explanatory variables used for the analysis are not correlated with each other. Hence, the null hypothesis that there is no multicollinearity among the explanatory variables was accepted.

CONCLUSIONS

This paper examined the relationship between poverty (proxied by discomfort index) and capital flight in Nigeria using time series data spanning from 1986-2014. The study revealed that persistent outflow of domestic resources due to capital flight have left a large proportion of Nigerian citizens to drown in the pool of poverty. Capital flow which occur as a result of exchange between countries have degenerated to an economic plague known as capital flight. Hence, if these large amount of money kept abroad by Nigerians are not repatriated, the menace of poverty will continue to deny Nigerian citizens of their national comfort. Due to the multiplier effect of capital flight on economic growth, real gross domestic product which is often seen as a remedy to the rising incidence of poverty in Nigeria have also failed to fulfill this expectation. Consequently, due to poor capital formation occasioned by capital flight, investments in infrastructures, especially in the educational sector and other key sectors of the Nigerian economy have declined which probably depleted the literacy rate, domestic production, and savings in Nigeria. In conclusion, it is glaring that the "marriage" that have lasted between capital flight and the Nigerian economy is begging for a "divorce".

Based on the findings from this study, the following suggestions were recommended:

-Policy makers should make efforts towards creating an enabling business and economic environment that will attract foreign investors. As such, proper diversification of the Nigerian economy is a good step towards achieving this fate.

-Since it is well known that Nigerian politicians hoard the resources they launder from the nation’s treasury. The government should lift some of the penalties due to these looters and allow them to invest in Nigeria coupled with stringent policies aimed at preventing further laundering of national wealth.

-Capital inflows and repatriation can be more effective if it is directed at improving and expanding managerial and labour skills in the domestic economy. In other words, the task of helping a “poor beggar” can be made more fruitful if it is directed at teaching him a trade rather than giving him food to eat. As such, the search for employment opportunities abroad (brain drain) will be reduced.

-To improve the growth rate in Nigeria, the government must acknowledge that the basic element in any prosperous development strategy should be to encourage residents first before considering foreign investors, due to the fact that they make up the bulk of investment activities in the economy. Thus, the most effective strategy for attracting foreign capital is to make the Nigerian economy very attractive and comfortable to Nigerian investors first.

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ANALYSIS OF FINANCIAL INDICATORS IN SC FITOPLANTAGRO LLC (2013-2015)

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Abstract

Company "Fito Agro Plant" was created in 2004 in order to serve farmers in the area of influence. Over time, the company opened three branches in Gorj (Targu Jiu) and Valcea (Mihăieşti and Ramnicu Valcea). The company's activity is quite complex, making the distribution of various types of inputs for agricultural production. In realization of the work and highlighting the financial results were used as tools to document comparison over time, and a number of specific indicators being operated at officiating (turnover, operating revenues, financial revenues, expenses operational, financial expenses, profit or loss, the rate of profit or loss, etc.).The specific activity conducted, it has expressed through favorable results for the years 2014 and 2015 (when achieved profit), but it also discusses situations and less convenient (2013 - losses of the unit).

Key words**:** *costs, loss, profit, revenue, turnover*

INTRODUCTION

The unit was established in 2004, being framed in the industry: Group 461 - Brokering activities in wholesale. The main activity is the Class 4611: trade in agricultural raw materials, live animals, textile raw materials and semi-finished goods.

The object of activity, according to NACE code comprises a wide range of activities [9].

The formation of the company was based on the association of two individuals, Romanian citizens, who have created a legal form of a limited liability company.

The declared company's headquarters are in the town Buleta, Valcea County, it may establish subsidiaries, as required by law. The company has opened stores in the cities: Ramnicu Valcea, Targu Jiu and Mihăieşti.

The life of the company is an unlimited one, and the subscribed capital was Lei 200 (50% for each partner), the increase or reduction of the capital and its transmission could be achieved in concrete terms stipulated in the founding document.

Based on these aspects, the company is an LLC classic fits in basic conditions "must have at least an associate and a maximum of 50 employees. The capital must have a minimum value of Lei 200, of which up to 60% can be contributed in kind and the rest in cash. [3].

Being included in the scope of activities for the provision of services for agriculture, the company must pay attention to the quality of the provided services. Quality of service is an important goal for both service providers and their clients. Service providers will get a higher exchange value (price) if they are concerned about the quality and/or strengthen their market position services [2].

The Company respects the findings theorists on that "stores are located in the strongest centers or villages in terms of agriculture, but also in the urban or regional markets and fairs" [4].

MATERIALS AND METHODS

To develop this research, the information needed were collected from the studied company where accountancy documents were consulted [10].

Thereby, it has operated under the profit and loss account so that integrates all expenditures and revenues, allowing the calculation of the indicators: disposable income, global production margin, self trading capacity [6]. Next, it took the group on homogeneous categories of indicators: income, expenses, profit. Besides of existing indicators in the profit and loss account, there were determined rates or loss of profits, according to the established methodology.

The principle of economic management is to cover the costs from agricultural income as the firms to be profitable.

The gross profit as the difference between revenues and costs, is diminished with the related tax resulting the net profit [7].

The study looked at the period 2013-2015, where a dynamic series of data was considered and the average of period was also used.

The evolution of the indicators level was examined, using indices with mobile basis.

RESULTS AND DISCUSSIONS

Indicators of income. Income express salable value of goods and services produced in a company [8].

Table 1 shows the indicators of income for the years 2013, 2014 and 2015.

The first indicator of income is represented by sold production. This indicator varied from Lei 22,215 in 2013 to Lei 3,324 in the year 2014 while the average period reached Lei 26,964.33 (Fig. 3.1.). The indicator increased by 50.1% in 2014 compared to 2013, followed by a reduction of 24% in 2015 (Lei 25,344) compared to the previous term of the dynamic series, while the average of the period outruns 1.06 times the situation specific to 2015.

Table 1. Indicators of income (Lei)

No.	Specification	2013	2014		2015		Average**	
		Ef.*	Ef.*	2014 /2013**	Ef.*	2015 /2014**	Ef.	Average /2015
1.	Production sold	22,215	33,334	150.1	25,344	76.0	26,964.33	106.4
2	Income from sale of goods	2,331,628	2,275,675	97.6	3,094,632	136.0	2,567,311.67	83.0
3	trade discounts	6,520	37,350	572.9	132,508	354.8	58,792.67	44.4
4	Net turnover (1+2-3)	2,347,323	2,271,659	96.8	2,987,468	131.5	2,535,483.33	84.9
5	Revenues from the production of tangible and intangible assets	-	-	-	16,926	100.0	5,642.00	33.3
6	Other incomes	11,426	-	-	20,934	183.2	10,786.67	51.5
I	Operating income (4+5+6)	2,358,749	2,271,659	96.3	3,025,328	133.2	2,551,912.00	84.4
7	Interest income	1,560	4	0.2	6	150.0	522.67	8711.2
8	Other financial income	1,708	226	13.2	641	283.6	858.33	133.9
II	Financial revenues (7+8)	3,268	230	7.0	647	281.3	1,381.67	213.6
III	Extraordinary revenues	-	-	-	-	-	-	-
IV	Total income (I+II+III)	2,362,017	2,271,889	96.2	3,025,975	133.2	2,553,293.67	84.4

* extracts from the profit and loss account (2013 – 2015);
**own calculation;

The revenue from sales of goods ranged from 2,275,675 lei to 3,094,632 lei in 2014 to 2015, the period average being 2,567,311.67 lei. The dynamics of the indicator is below in 2014 (97.6%) and the average of the period (83.0%) and above in 2015 (136.0%).

The trade discounts reached 6,520 lei in 2013, 37,350 lei for 2014 (+472.9%), 132,508 lei in 2015 (+254.8% in dynamics), and the period average was 587,92.67 lei (-55.6%).

As a result, income was mainly influenced by the sale of goods. It can be seen that the net turnover was between 2,271,659 lei in 2014 and 2,987,468 lei in 2015, and the average reached 2,535,483.33 lei. The dynamics of the indicator is similar to the one of the revenue from the sale of goods. So, it was observed a decrease by 3.2% in 2014 compared to the previous term of the dynamic series, a growth by 31.5% in 2015 compared with the previous term of the dynamic series and a decline by 15.1% in average compared to the situation of 2015.

The revenues from the production of tangible and intangible assets were present only in 2015, 16,926 lei, which resulted in an average of the period of 5,642 lei (33.3% in dynamics).

The company recorded other income related to the operating activities as follows: 11,426 lei in 2013 and 20,934 lei in 2015 (1.83 times in dynamics compared to the 2013) so that the average period reached 10,786.67 lei (51.5% in dynamics).

The operating income reached: 2,358,749 lei in 2013; 2,271,659 lei in 2014, 96.3% in dynamics; 3,025,328 lei in 2015, 133.2%; and 2,551,912 lei for the period average (-15.6%).

The unit recorded an interest income of 1,560 lei for the year 2013, 4 lei for 2014 (0.2% in dynamics) and 6 lei for 2015, so that the average of the period was 522.67 lei.

The dynamics highlights below par values in 2014 and above par in 2015 (+50.0%) respectively for period average (87.11 outrunning of reporting basis).

The unit also performed other financial income as follows: 1,708 lei for the year 2013, 226 lei in the year 2014, 641 lei in 2015, 858.33 lei average for the period.

In dynamics, the fluctuating developments occurred in 2014 were represented by a decrease compared to the first term of the dynamic series (-86.8%) and brought forward an increase compared to the reporting bases in 2015 and the period average (2.83 and 1.33 times).

The financial income is based on two sources mentioned above, so that they reached 3,268 lei in 2013, 230 lei in 2014, 647 lei in 2015 and 1,381.67 lei as the period average. Under these circumstances, the dynamics contains a subunit value (7.0% in 2014) and the two above par values (281.3 and 213.6% respectively for 2015 and the period average).

It is worth to mention that the company did not record extraordinary income during the period under review.

Starting from the three categories of revenues (operating, financial and extraordinary), it was constituted the total revenue of the unit, which was the following one: 2,362,017 lei for 2015; 2,271,889 lei in 2014, 96.2% in dynamics; 3,025,975 lei for 2015 (increase of 33.2% over the reporting basis); 2,553,293.67 lei for the period average (-15.6% compared to 2015 - reference term).

Indicators of expenses. Cost in agricultural production is an economic category which depends on production of goods, a manifestation of the law of value, directly linked to the process of obtaining goods and services [1].

Table 2 contains the indicators of expenditures for the period under review. It refers to operating expenses, financial expenses, extraordinary expenses and total expenses.

It may be noted that the unit achieved only operating costs and financial expenses (quite low compared to the first category). As a result, the total expenditure is influenced - largely - by amount of operating expenses.

The expenses with raw materials and consumables ranged from 71,677 lei in 2014 to 116,431 lei in the year 2013, while the average of the period was 90,282.67 lei.

The dynamics highlights the uneven trend of the indicator, some decreases in 2014 (-38.4% compared to 2013), being followed by an increase in 2015 (82,740 lei, 1.15 times more than in the previous term of dynamic series) and also an increase for the average of the period (1.09 times).

Other material costs have close levels in the years 2013 and 2014: 49,046 lei and 49,450 lei respectively. In 2015, the indicator was located to a quota of 82,721 lei, something which leads to a period average of 60,405.67 lei. In dynamics, a surplus was noticed compared to the terms of reference for 2014 and 2015 (+0.8 % and + 67.3%), but also decreases (-27.0%, for the period average).

Spending on goods recorded an average of 1,842,017.33 lei (-14.9%), value which is based on annual levels of indicator as: 1,556,638 lei in 2014 (86.2%), 1,806,135 lei in 2013 and 2,163,279 lei for 2015 (+39.0% in dynamics).

The company benefited from trade discounts for all years: 9,506 lei in 2013, 75,783 lei in 2014, 133,804 lei in 2015. This led to an average of the period of 73,031 lei. In these conditions, the dynamics experienced one below par value (period average - 54.6%) and two above par values in the years 2014 and 2015 respectively (7.97 and 1.76 times exceeded the terms of comparison).

A result of this situation, total expenses related to materials and goods ranged from 1,606,898 lei in 2014 to 2,198,861 lei for 2015, and in 2013 they reached the 1,967,405 lei. In these circumstances, the average of the period was 1,924,388 lei, which represented a decrease in dynamics by 12.5% over the reporting basis. The dynamics of the indicator is one uneven, the decreases of 18.3% in 2014, being followed by surplus over the reporting term in 2015: 1.36 times.

Table 2. Indicators of spending (Lei)

No.	Specification	2013	2014		2015		Average**	
		Ef.*	Ef.*	2014 /2013**	Ef.*	2015 /2014**	Ef.	average /2015
1	Raw materials and consumables	116,431	71,677	61.6	82,740	115.4	90,282.67	109.2
2	Other material expenses	49,046	49,450	100.8	82,721	167.3	60,405.67	73.0
3	Expenditure on goods	1,806,135	1,556,638	86.2	2,163,279	139.0	1,842,017.33	85.1
4	Other external charges (energy and water)	5,299	4,916	92.8	3,925	79.8	4,713.33	120.1
5	Trade discounts received	9,506	75,783	797.2	133,804	176.6	73,031.00	54.6
6	Total material expenses and related to goods (1+2+3+4-5)	1,967,405	1,606,898	81.7	2,198,861	136.8	1,924,388.00	87.5
7	Salaries	274,583	232,316	84.6	314,154	135.3	273,684.33	87.1
8	Insurance spending	68,832	56,095	81.5	65,813	117.3	63,580.00	96.6
9	Personnel expenses (6+7)	343,415	288,411	84.0	379,967	131.7	337,264.33	88.8
10	Value adjustments on tangible and intangible assets	89,887	83,983	93.4	52,143	62.1	75,337.67	144.5
11	Value adjustments on current assets	-5,630	105,215	-	1,313	1.2	33,632.67	2561.5
12	Expenditure on external services	96,310	97,753	101.5	131,844	134.9	108,635.67	82.4
13	Other taxes, duties and assimilated payments	7,439	8,157	109.7	11,358	139.2	8,984.67	79.1
14	Other expenses	6,121	1,645	26.9	11,762	715.0	6,509.33	55.3
15	Other operating expenses (external services, other taxes - taxes - contributions, donations compensation, assets transferred) (12+13+14)	109,870	107,555	97.9	154,964	144.1	124,129.66	80.1
I	Total operational expenses (6+9+10+11+15)	2,504,947	2,192,152	87.5	2,787,248	127.1	2,494,782.33	89.5
16	Interest charges	35,224	43,271	122.8	34,383	79.5	37,626.00	109.4
17	Other financial charges	1,971	-	-	1,916	-	1,295.67	67.6
II	Financial expenses (16+17)	37,195	43,271	116.3	36,299	83.9	38,921.67	107.2
III	Extraordinary expenses	-	-	-	-	-	-	-
IV	Total expenses (I+II+III)	2,542,142	2,235,423	87.9	2,823,547	126.3	2,533,704.00	89.7

[*] extracts from the profit and loss account (2013 – 2015)
[**] own calculations

Salaries went down from 274,583 lei in 2013 by 15.4% in 2014 (232,316 lei), and increased by 35.3% in 2015 (314,154 lei). The average period reached 273,684.33 lei, representing only 87.1% from the comparison term.

Insurance spending have averaged 63,580 lei (-3.4% compared to the reporting basis), with extremes of 56,095 lei in 2014 and 68,832 lei in 2013, and in 2015 the indicator reached 65813 lei. The dynamic is similar to that recorded for wages.

Based on salaries and insurance charges, the personnel costs were determined. This indicator had fluctuating values in the analyzed period, from 343,415 lei in 2013 to 288,411 lei for 2014, respectively 379,976 lei in 2015. It was noticed an uneven trend of the indicator, highlighted by the exceed of the reference 1.31 times in 2014, respectively by decreases towards it in 2014 and the period average (16.0% and 11.2%, the average actual level 337,264.33 lei).

Another item of expenditure appears as the adjustments to tangible and intangible assets, indicator which has a downward trend. The year 2013 is characterized by a value of 89,887 lei, that drops to 83,983 lei in 2014 (-6.6%) and 52,143 lei for 2015 (-37.9%). In these circumstances, the average of the period reached 75,337.67 lei (144.5% over the reporting basis).

Adjustments to current assets were negative in 2013 (-5,630 lei) and reached 105,215 lei in 2014, then dropped to only 1,313 lei in 2015. In this context, the average of the period was 33,632.67 lei.

Expenditure on external services were 96,310 lei in 2013, and increased by 1.5% in 2014 (97,753 lei), continued to grow (+34.9%) in 2015 (131,844 lei), while the average of the period was lower by 17.8% compared to the reporting term: 108,635.67 lei.

Costs with other taxes, duties and assimilated payments ranged from 7,439 lei in 2013 to 11,358 lei in 2015, while the average of the period was 8,984.67 lei. In the dynamics, it can be seen above par values for the years 2014 and 2015 (1.39 and 1.09 times overruns of reference terms) and subunit values for the period average, 79.1%.

For other expenses, the company recorded an average of 6,509.33 lei (-44.75 in dynamics), average, which is based on sequential values of 1,645 lei in 2014 (26.9% in dynamic), 6,121 lei for the year 2013 and 11,762 lei for 2015 (overflow 7.15 times the base of comparison).

According to the values referred for the last three indicators, there were determined other operating expenses, which registered: 109,870 lei in 2013, 107,555 lei in 2014 (97.9%), 154,964 lei for the year 2015 (144.1%). Based on these values, it was determined the average of the period, which was 124,129.66 lei, reflecting a decrease in dynamics by 19.9% over the reporting basis.

Total operating expenses were based on total material expenses, personnel expenses, adjustments of tangible and intangible value adjustments on current assets and other operating expenses. Based on the indicator values, previously named, there were reached the following sequential levels: 2,504,947 lei in 2013; 2,192,152 lei in 2014 (-12.5% in dynamics); 2,787,248 lei in 2015 (+27.1% compared to the benchmark); 2,494,782.33 lei period average (-22.5% in dynamics).

These values noted the fluctuating trend in operating expenses for the considered period.

The company carried interest expenses related to variables as follows: 35,224 lei in 2013, 43,271 lei in 2014 (+22.8% in dynamics), 34,383 lei in 2015 (-20.5%), 37,626 lei for the period average (+9.4%). Other financial expenses have averaged 1,295.67 lei (-32.4% compared to the previous term of the dynamic series), which is based on the average annual values sequential 1,916 lei in 2015 and 1,971 lei for 2013.

Total financial expenses ranged between 36,299 lei in 2015 (83.9% in dynamics) and 43,271 lei at the level of 2014 (116.3%). The average of the period reached 38,921.67 lei (107.2%).

Looking at the value of the indicator in the year 2013 (37,195 lei), we can say that it (indicator) has evolved unevenly for the period under review.

Regarding the total expenditure, it is noteworthy that it varies between 2,235,423 lei in 2014 (-12.1% compared to the basis term) and 2,823,547 lei in 2015 (+26.3%), and the average reached 2,533,704 lei (-10.3% in the dynamics). The evolution of indicator fluctuates.

Profitability indicators. Profits, in the broadest sense, can be regarded as profits made in cash, by those who initiates and organizes the economic activity [5].

Table 3 shows the profitability indicators for the period under review.

Profit or loss from operations is characterized by an average of 57,129.67 lei, value resulting from sequential annual levels -146,196 lei (loss) in 2013, 79,507 lei specific to 2014 and 238,080 lei in the year 2015.

These values underlines the upward trend of the indicator, breaches of reference terms in 2015 (2.99 times), while the average period occurred decreases (-76.0%).

The financial loss was 33,927 lei in 2013, 43,041 lei in 2014 and 35,652 lei in 2015 (dynamics values below par in 2014 and above par 2015, 126.9% and 82.8% respectively). A result of this situation, the average period reaches 37,540 lei, or 105.3% compared to the term of reference.

Profit or current loss showed as the previous indicators sum, so it was noticed a loss of 180,125 lei in 2013, 36,466 lei profit for 2014 - and 202428 lei in 2015, the average being 19,589.67 lei.

Table 3. Profitability indicators

No.	Specification	U.M.	2013	2014		2015		Average**	
			Ef.	Ef.	2014 /2013**	Ef.	2015 /2014**	Ef.	Average /2015
1	Profit - operating loss *	lei	-146,198	79,507	100	238,080	299.4	57,129.67	24.0
2	Profit - financial loss *	lei	-33,927	-43,041	126.9	-35,652	82.8	-37,540.0	105.3
3	Current profit or loss (1+2) *	lei	-180,125	36,466	100	202,428	555.1	19,589.67	9.7
4	Extraordinary profit or loss *	lei	-	-	-	-	-	-	-
5	Gross profit or loss (3+4) *	lei	-180,125	36,466	100	202,428	555.1	19,589.67	9.7
6	Income tax *	lei	-	-	-	17,868	100	5,956.00	33.3
7	Other taxes or levies *	lei	-	-	-	-	-	-	-
8	Net profit or loss (5-6-7) *	lei	-180,125	36,466	100	184,560	506.1	13,633.67	7.4
9	The rate of profit or loss from operations **	%	-5.83	3.63	100	8.54	235.3	2.29	26.8
10	The rate of profit or loss Current **	%	-7.08	1.63	100	7.17	439.9	0.77	10.7
11	Rate extraordinary profit or loss **	%	-	-	-	-	-	-	-
12	Gross profit or loss rate **	%	-7.08	1.63	100	7.17	439.9	0.77	10.7
13	The rate of net profit or loss **	%	-7.08	1.63	100	6.53	400.6	0.54	8.3

* extracts from the profit and loss account (2011 – 2013)
** own calculation

The dynamics of the indicator is characterized by an over-unit value of indices for the year 2015, and a sub unitary one for the period average (9.7%).

Gross profit or gross loss equals the current profit or loss of current, since the company did not record extraordinary profit or loss.

The Company paid income tax only in the year 2015 (17,868 lei), but it did not pay "other taxes". In these circumstances, the average period was 5,956 lei, a level which was only 33.3% of the basis of reporting.

Net profit is characterized by an average of 13,633.67 lei, while the extreme values of the indicator appeared in 2014: 36,466 lei in 2015 and 184,560 lei, and in 2013 the net loss was equal to the gross loss (-180,125 lei). Dynamics is one indicator uneven overruns of the reporting limit for 2015 was 5.06 times, while for the average period there was a decrease of 92.6% compared to the term of reference.

The rate of profit/loss from operations was -5.83% in 2013, 3.63% for 2014, 8.54% in 2015 and 2.29% for the average period. The evolution in time of the indicator takes the form of an uneven trend, exceeding the reference from 2015 was 2.35 times, followed by declines of 73.2% for the period average.

It can be seen that the rate of profit/loss of current is significantly less than the previous indicator: -7.08% in 2013, 1.63% in 2014, 7.17% in 2015, 0.77% for the average period.

The rate of profit/loss equals gross profit rate/current loss since the company did not record extraordinary profit or loss.

Last profitability indicator refers to net profit rate. It can be seen that this indicator has averaged 0.54% (8.3% compared to reporting base), with values of -7.08% for 2013, 1.63% for the 2014 and 6.53% by 2014. The consequence of this situation, the dynamics is one uneven.

CONCLUSIONS

The study les to the following conclusions:

- In the structure of total revenues, operating income dominates with 99.94%, financial income is only 0.06% of the total. Detailed structure of total revenues, highlights the contribution percentage: 99.30% turnover, 0.22% income from the production of tangible and intangible assets, other income 0.42% (Fig. 1.).
- In the structure of total expenditures the material costs and related goods are prevailing 75.95%, followed by personnel costs - 13.32%. Other operating expenses: 4.89% adjustments on tangible and intangible assets: 2.97%, financial expenses: 1.53% and adjustments on current assets: 1.33% (Fig.2.).
- The Company recorded operating profit and financial loss -57,129.67 lei respectively - 37,540 lei, which make up the current profit 19,589.67 lei.

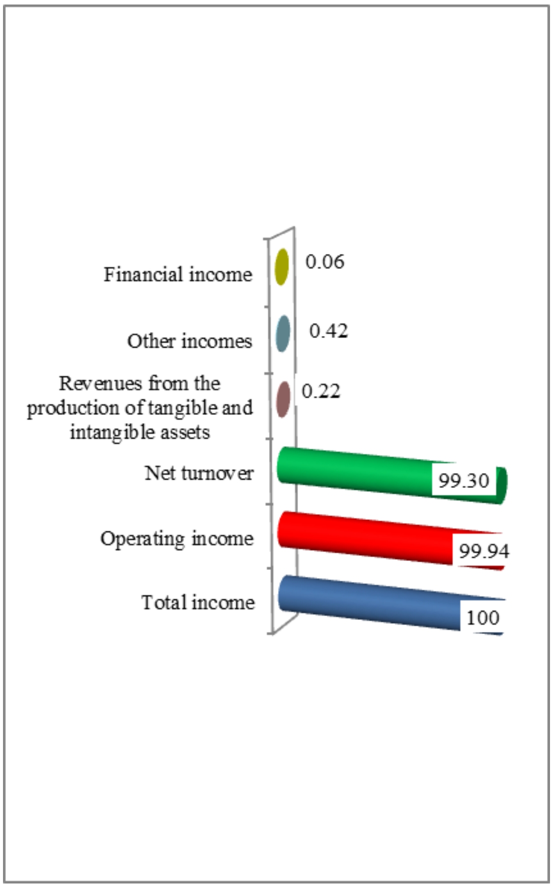

Fig.1. The ratio of total income and its main components (%)

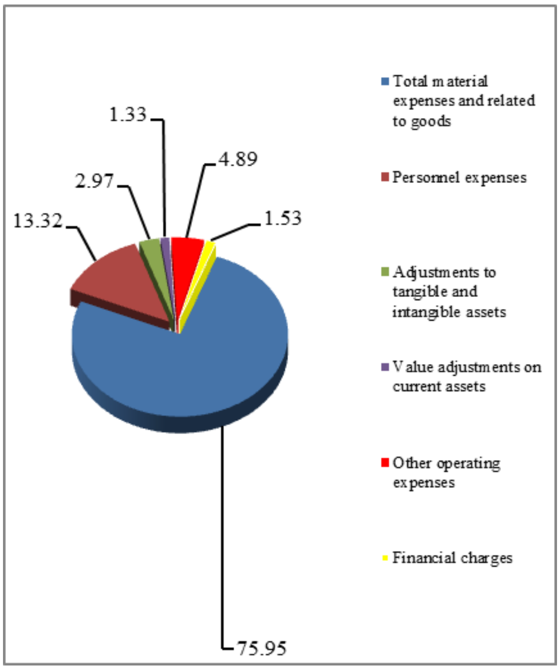

Fig.2. Total expenditure structure (%)

-Given that the unit did not record extraordinary profit or loss, we find similarity between the profit / loss of current and raw respectively, the latter decreasing by taxes paid, so as to arrive at a net profit of 13,633.67 lei.

- These results are influenced by the situations suitable for the years 2014 and 2015, and the specific losses of 2013.

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FISHING, A RESOURCE IN THE TOURIST RAZIM – SINOE AREA

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Abstract

Fishing is one of the tourist resources available to the Danube Delta area. Analysis of this resource highlights the link between this activity and the number of tourists arriving in the area contributes to the development of tourism in the Razim-Sinoe area. For this study, the statistical data provided by the National Statistics Institute, Tulcea County Department and the Danube Delta National Institute for Research and Development were used. The data were processed and converted into tables, graphs and then interpreted and analyzed. Ichtyofauna of the lagoon area is very diverse comprising dozens of species: catfish, carp, bream, crucian carp, rudd, rapacious, pike, zander, perch. Following the available data, there is a decrease by about 50 % in catches, between 2003-2013, both within each species and in total, from a quantity of 5,635 tons in 2003 to 2,307 tons in 2013. Catch experienced a dramatic drop caused by a number of shortcomings of fisheries. Such problems of fisheries are connected with the fishing law, but also with the fish marketing. Fishing facilities face a wide range of shortcomings of technical, organizational or management, making it difficult to start or materialize licensees projects. These deficiencies of fish facilities and that the authorities do not invest in their redevelopment, are observed in the number of tourists visiting this area, where there are 44 accommodation units. The number of visitors was 73,767 in the year 2014, of which 53,322 Romanian and 20,445 foreign tourists. The months with the highest number of tourists are July, August and September.

Key words*: *deficiencies, fisheries, fishing, natural water, tourists

INTRODUCTION

Fishing is the representative activity, often combined with agrotourism in the Razim-Sinoe area [4]. On the surface of the analyzed territory, fish farming on an industrial scale is the main economic activity, organized especially on designated areas [3].

Discussing about "Fisheries", we must think to fish biology, fishing methods and areas. From this point of view, fisheries can be classiefied into two major categories:(i)fisheries of freshwater fish (predominantly) and fisheries of marine fish in the marine area (often of a mixed profile) [1].

In this context, the paper purpose was to analyze fishing as a resource in the Razim-Sinoe area.

MATERIALS AND METHODS

The statistical data provided by the National Statistics Institute, Tulcea County Department and the Danube Delta National Institute for Research and Development were used in this study. Then, the collected data were processed and converted into tables, graphs and then interpreted and analyzed.

RESULTS AND DISCUSSIONS

Organization of fishing activities. Commercial fishing in inland waters is conducted in natural water basins constituting the national public domain, respectively Razim- Sinoe, with the adjacent canals and lakes.

Fishing is done with fixed gear or mobile, using small fishing boats. The number of fishermen formally comprises 414 people organized in 12 associations of professional fishermen located at: Sarichioi (29 employees), Sabangia (21employees), Dunavăţ (30 employees), Holbina (13 employees), Popina-Holbina (12employees), Jurilovca (178 employees), Iazurile (14 employees), Murighiol (56 employees), Plopu (11 employees), Istria (30 employees), Sinoe

(30 employees), Nuntași (15 employees). These companies have employees in the area and their number varies from one society to another [2] [10].

a)The marine sector. By 1980, the share of fisheries in the Black Sea coast was small, representing only 8% of the total catch of marine and oceanic fisheries, being produced by a stationary fishing along the coast between Sulina and Mangalia. Since the 80s, along with passive fishing when it took the active fishing by establishing inshore fishing fleet (vessels traler first 2 - 25m), catches have doubled. After 1990, the decline begins by gradually reducing fishing activities, especially fishing effort, the decrease in equipping.Capturile Plummeted by half, continuing a decline from year to year.

b)The internal waters. The fish production has decreased by nearly seven times until 1989. After 1990, after the privatization of the fishery, the total domestic fish production declined from 74,000 tons in 1989 to less than 10,000 tons at the moment. A similar evolution took and inland fisheries, which decreased from 19,582 tons to 8,000 tons at present. Before 1989 the total fish production of Romania (including ocean fisheries) reached 300,000 tons/year, and for this reason, Romania was situated on the 3-4 position in Europe [7].

Membership catches

(a)The marine catches. The number of fish species in the Black Sea fell from 50 species in 1960 to 10 species at present. A main cause of the decrease in the number of species in the Black Sea is the reduced salinity, which led to the disappearance of the last basic fishing species.

Regarding the Pelagic species, the own share of catches in the Romanian sector of the family Clupeidae is the main group of fish (over 70% of the total catches), represented by 4 species: sprat, gigiri, shad. Among them, an important contribution was brought by sprat (85-90% of the total catch), followed far away by the Black Sea sprat (3%) and mackerel (1.5%). In addition to these species, there are catches of anchovy, mackerel, mullet.

(b)The inland waterways sector. Ichtyofauna in the lagoon area is very diverse comprising dozens of species such as: catfish, carp, bream, crucian carp, rudd, rapacious, pike, zander, perch [9].

Table 1. The situation of the two catches recorded in the Razim-Sinoe during 2003-2013 (tons)

Year	Total	Caras	Roach	Flat-fish	Sleep	Carp	Zander	Luce	Perch	Other species
2003	5,635	2,276	647	524	45	119	214	7	13	378
2005	4,417	1,368	586	1,382	22	63	99	4	4	193
2007	2,908	998	289	1,032	20	41	85	28	3	58
2009	2,928	1,016	297	940	80	119	141	52	16	50
2011	2,592	920	272	822	110	125	80	78	27	55
2013	2,307	1,152	155	569	78	191	62	38	12	49

Source: National Institute of Statistics, Department of Statistics Tulcea, 2014

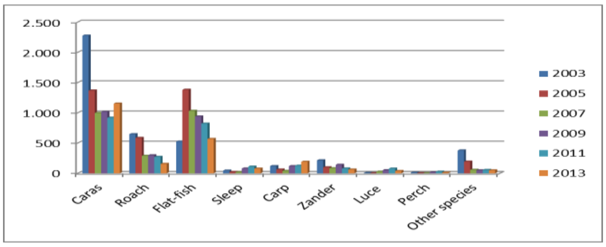

Fig. 1. The evolution of catches in the Razim-Sinoe area

Source: Own determination.

Watching the data (Fig.1), it was noticed a decrease in catches, between 2003-2013, both within each species and in total, from 5,635 tons in 2003 to about 50 % less, 2,307 tons in 2013.

Problems faced by fisheries. Studying the evolution of catches, one may find the reasons why it has experienced such a dramatic decline. In this respect, it was identified a number of shortcomings by fisheries:

a)Problems of fishermen: the decline of fisheries in line with the decline of valuable species of fish; changing the structure of catches of species; intensification of fishing; resource management divided among several institutions; faulty or nonexistent monitoring; lack of investment, administration and research.

b)Right to fish: divergences on the effectiveness of the way and the form of awarding fishing rights: allocation of fishing rights directly by fisheries ARBDD; the granting fishing rights of fishermen's private associations; the granting of fishing rights to private companies by auction.

c) Marketing of fish: a system of collecting fish from fishermen, inadequate market economy, deficiencies in the marketing of fish after collection stage.

Identifying deficiencies facing the fisheries arrangements. Fishing facilities face a wide range of shortcomings of technical, organizational or management, making difficult to start or materialize trade projects: most of the companies do not pursue the objectives set out in the specifications (are cases of land alienation and abandonment); companies using leased ponds for fish,pollute the river with some small amounts of pollutants; fishing facilities proposed to be subject to ecological reconstruction work registered major technical deficiencies such as: channels draining showing a higher degree of clogging, pumping stations are decommissioned, surface water of ponds is much diminished due to invasion of the emerged reeds vegetation, the basins are covered 40-50% by this vegetation [5].

Table 2. Classification of the fish facilities in the Razim -Sinoe area according to the degree of functionality

Functional facilities	Arrangements impaired	Dysfunctional infrastructure
	(proposed rehabilitation of infrastructure)	(suitable for ecological reconstruction work)
Sarinasuf	Iazurile III (400 ha)	Popina
Murighiol (242 ha)	Enisala	Ceamurlia I-II
Iazurile I-II (513 ha)	Lunca I-II-III (277 ha)	Enisala (92 ha)
6 Martie (Sălcioara)		Dunavăț I-II
Lunca I-II (779 ha)		Murighiol (2.018 ha)
Babadag și Sabangia		Holbina I-II

Source: Zonal Plan landscaping Danube Delta National Institute for Research and Development, Town Planning, Bucharest, 2008

It is observed from Table 2 that the number of functional improvements is 6, a number equal to those inoperative. Therefore, it is necessary to access European funds for their rehabilitation.

Regarding the technical characteristics of ponds in fish farming, they are classified into two categories: a consumption growth and growing brood fish. Depending on each destination, they can be used or not for fishing, and for attracting a large number of tourists in the area [8].

Thus, fish farming is directed to: growing brood (Summer I) in one of the ponds II, and the other being designed to increase fish consumption (Summer II) at Lunca I, III, 6 Martie, Babadag, Sabangia, Sarinasuf and Murighiol.

We will continue to analyze the technical deficiencies identified in the operation of fish facilities. These weaknesses leave a mark on the number of tourists arriving in the area for tourism or fishing purposes (Table 3) [10].

Table 3. Technical deficiencies identified in the operation of fish facilities

Fishery name	Concession area (ha)	Categories of technical infrastructure deficiencies
Babadag	1,800	-Dams degraded (90%) because peaty soils
Ceamurlia I,II	3,500	-draining channels clogged -ponds vegetation cover after (40-60%) -disused pumping stations -dams and hydro installations degraded
Dunavăț I,II	3,245	-ponds vegetation cover after (20-40%) -dams partially degraded
Enisala	420	-ponds vegetation cover after (60-80%) -Food draining clogged channels and channel partially clogged -disused pumping stations
Iazurile I,IV	600	-embankments damaged -subdivision damaged levees -salty soils
Lunca I,III,IV	1,934	- ponds vegetation cover after (40-60%) - draining channels and pits quality fishing - dams partially degraded
Murighiol	242	- ponds vegetation cover after(40%) - supply ducts and draining partially clogged
Popina	6,176	- hard cover pond vegetation and forest vegetation (willow, small willow) - supply ducts, exhaust, clogged drains - pumping stations inoperative - partially damaged mains
Sarinasuf	590	-ponds vegetation cover after(50%) - submersed vegetation - damaged levees
6 Martie	1,050	- ponds vegetation cover after(20-30%) - partially damaged levees

Source: Zonal Plan landscaping Danube Delta National Institute for Research and Development, Town Planning, Bucharest, 2008

These deficiencies of fish facilities and that the authorities do not invest in their redevelopment, are observed in the number of tourists visiting the area. In the area there are 44 accommodation units [7]. The tourist number accounted for 73,767 in the year 2014, of which 53,322 Romanian tourists and 20,445 foreign tourists. The months in which there is a large number of tourists are July, August and September [7].

If these deficiencies should be rectified in the shortest possible time, the area would be of a greater availability and attractiveness and the number of tourists will be higher. This would lead to the economic development of the area.

CONCLUSIONS

Catch experienced a dramatic drop caused by a number of shortcomings of fisheries. Such problems of fisheries are connected with the fishing law, but also with the fish marketing.

Fishing facilities are facing a wide range of shortcomings of technical, organizational or management nature, making difficult the materialization of trade projects: most of the companies do not pursue the objectives set out in the specifications (there are cases of land alienation and abandonment); companies using leased ponds for fish and pollute the river with some small amounts of pollutants; fishing facilities proposed to be subject to ecological reconstruction work are facing major technical deficiencies regarding: channels draining showing a higher degree of clogging, pumping stations are decommissioned, surface water of ponds is much diminished due to invasion of the reeds vegetation emerged, about 40-50% of the surface is covered by this vegetation.

These deficiencies of fish facilities and that the authorities do not invest in their redevelopment have a deep impact on the number of tourists visiting the area, where 44 accommodation units are waiting for them. The number of visitors was 73,767 in the year 2014, of which 53,322 Romanians and 20,445 foreign tourists. The months in which there is a large number of tourists are July, August and September.

Analyzing the weight of the number of tourists, it was noticed an important flow during the summer season.

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MANGALIA SPAS POTENTIAL, A POTENTIAL TOURISM RESOURCE OF THE ROMANIAN SEASIDE

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Abstract

Treatment Tourism is a specific form of rest tourism, destined to prevent certain illnesses or diseases. This is one form of the constant movement of a tourist relatively stable clientele. The paper analyzes the main forms of tourism in the area, referring in particular to the spa potential and its recovery. The study analyzes the main forms of tourism in Mangalia, focusing on spa treatment and the resources available in the city for bathing cures. The data from the National Institute of Statistics, Department of Statistics Constanta, regarding the flow of tourists in Mangalia were used. The data were processed and converted into tables, graphs and then analyzed and interpreted. The study pointed out that Mangalia is visited by tourists four months a year (June, July, August, and September), and tourists who spent their holidays in Mangalia are both of Romanian and foreign origin. The number of tourists in Mangalia fluctuated from 210,000 in 2010 to 240,000 in 2014. The average length of stay is 5 days in sanatorium, like in the rest of spas in the country. Of the total arrivals in Mangalia, only 2% tourists have treatment tickets. Customer categories have the following structure: 35% retired persons, 25% people with secondary education, 25% persons with higher education, 5% artists and sportsmen, 0.5% other professions.

Key words: *tourism, natural mineral water, vegetable slime, therapeutic gases*

INTRODUCTION

Since ancient times, by exploring the environment, man discovered the mineral waters. The archaeological discoveries have come to light parts of the ancient Roman baths used for spa in Herculane, Ocna Sibiului, Buziaş, Moneasa, Călan etc. [7].

During the time of the Roman Dacia, the war wounded or sick people used those waters to recover and to thank the gods they built shrines and worked commemorative stones in their honor. Since then, the Romanian balneology evolved and the resorts have come to mean true health centers with very good specialists in the field and endowed with modern medical equipment [1].

Today, health tourism is a form of tourism constant movement, one of the major tourism segments as it presents specific features represented by the inviting environment [2]. These factors can be used for a range of spa treatments. It stands out from other types of tourism because it has both economic and social benefits that bring positive effects on people's physical and mental condition.

Tourism treatment not only cater to people with medical problems but also to those who want to rest, to relax, to have a physical and mental condition, to regain their vitality[3].

In this context, the paper aimed to analyze Mangalia spa potential as a potential tourism resource on the Romanian Black Sea shore.

MATERIALS AND METHODS

The main methods used in this study were: comparative methods, inductive, deductive method of direct visual observation of the area and photographic methods. The data were collected from National Institute of Statistics, Department of Statistics Constanța. They regard the flow of tourists in Mangalia. The data were processed and sumarrized into tables, nicely illustrated in graphs and then interpreted and analyzed.

RESULTS AND DISCUSSIONS

The Romanian spas have natural therapeutic factors such as: mild climate, various natural mineral waters, mud and gas emanations.

In this article we will refer and analyze the seashore therapeutic factors that have driven the development of spa tourism in Mangalia [4].

a) **Beach** is a natural curative factor of the seashore. Its sand consists of marine sediments, rock fragments and remnants of shells. In Mangalia, the predominant component tcomes from limestone shells. An important character is the grain of sand but also its chemical composition especially in the treatment of sand called psamotherapy. In Mangalia, sand has a medium particle sand size. Due to its medium grain sand size in the Mangalia, sand could be easily heated reaching at midday even at + 44 ° C in summer season. Walking on the beach is a hydrotherapy spa procedure which helps blood and lymphatic circulation in the limbs. There are also the well known "baths of sand", which are arranged in a hollow, where a thick layer of sand is left in the sun for about an hour after heating, and the same patient will lie down in that hole and covered with a thin layer of sand, and after that will take a bath in the sea[11].

b)**Thalassotherapy** is another sort of salt bath where both the waves and sea water temperature have a combined effect. An important therapeutic factor is the sea and its chemical composition. Seawater is hypertonic (13-18g ‰), containing important minerals such as: sodium, magnesium, sulphate and chlorinated [10].

c)**Sunrays** have the strongest radiation around midday, being 4 times more powerful than in the morning because of the atmosphere that pervades almost vertical. Sunbathing are essential because they activate metabolic processes in the body and causes redness, pigmentation.

d)**Sludge from Mangalia**. The peat mud is well hydrated (water 826 g ‰) and rich in various minerals. This requires no further processing prior therapy because it is well decomposed.

e)**The mineral springs in Mangalia** is another important therapeutic factor used both internal and external cures. These are meso temperature springs of +20 to + 25 °C, the heat comes from the depth thereof where the layers of gypsum are decomposed by bacteria and debris sulfur. They have a poor mineralization and contain hydrogen sulfide. It comes from sand and pyrite from Sarmatian sandstones [10].

Harnessing these resources is achieved largely at Mangalia Sanatorium which was established in 1975 under the Ministry of Health as a specialized medical unit of national interest. It is structured in 2 pavilions: Pavilion A and Pavilion B. Pavilion A comprises a hotel, a clinical ward, a treatment center, cafeteria, administrative offices, laundry, heating, water pumping station and a substation high. It is approximate 1 km to Pavilion B. Pavilion B comprises: a treatment center, a central heating, laundry and a substation.

The procedures performed are the following ones: massages handmade by specialized professionals with various ointments, mud and massage-type shower-massage; hydro mud which consists partially or totally of different baths: salty, sulfurous hot herbal baths, herbal whirlpool, sauna; physical therapy can be made both in a group and individually, and it is another form of hydro-kinetotherapy which works with seawater pool or sulfur; pneumotherapya is performed using aerosols which may be individual drug substances, seawater and sulfur mineral water buffered; electrotherapy which is made with currents: ionization bathrooms Stanger, shortwave, ultrasound; electro magnetic therapy can be done by local or general or diapuls: high frequency pulsating with anti-allergic effects, anti-inflammatory effects; phototherapy, relying on infrared light. Other treatments: gynecological, acupuncture, infiltrations.

The therapeutic indications in the treatment of recovery are: respiratory diseases, orthopedic injuries, impairments, neurological, gynecological, dermatological, and digestive diseases.

The tourism infrastructure in Mangalia

There is wide range of accommodation units in the city, including hotels dating back many years (Callatis, Corsa, President, etc.) and various villas and apartments leased by private citizens.

The hotels in Mangalia are prevalent as accommodation units. The number of beds rose to 1,400 in the city hotels and resorts, and the housing capacity in terms of seats reached about 52,000 beds.

Located on the seafront, at 50 m distance from the town, the Mangalia Sanatorium has a two-star hotel with a capacity of 200 seats, two clinical sections each with 75 beds and two modern treatment, serving both wards with beds the sanatorium and ambulatory - located in Matei Basarab street no. 3 Mangalia, with a total capacity of 1,000 patients per day. Tourists choose this destination both for leisure and for treatment [6].

Tourist flow for spa purposes. Tourists come in Mangalia, obviously for coastal and others for spa treatment. In this way, they can visit the city's main attractions because many tourists come for a longer stay. Mangalia is visited by tourists in four months of the year (June, July, August, and September). In the rest of the year, many of the accommodation units are closed and the number of tourists is insignificant. The tourists who spend their holidays in Mangalia are both Romanians and foreigners [5].

Table 1. Number of tourists arriving in Mangalia in the period 2010-2014

Year	Tourists arrivals
2010	210,000
2011	220,000
2012	240,000
2013	210,000
2014	240,000

Source: National Institute of Statistics, Department of Statistics Constanța

Spa tourism in Mangalia strongly fluctuated until 2012 (Table 1) reaching a total of 240,000 tourists in 2014, but this number has recorded a significant decrease to 210,000 people in 2013. But, since 2014, it started to rise again recording 240,000 tourists, like in 2012 (Fig. 1) [5].

The average length of stay is 5 days in sanatorium, like in the rest of spas in the country.

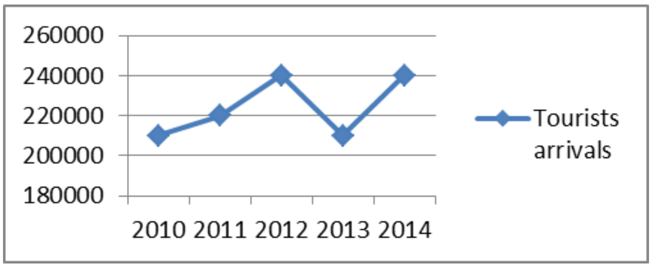

Fig.1. Tourists arrivals in the establishments of tourists' reception with functions of tourists in Mangalia City in the period 2010-2014
Source: Own determination.

In Mangalia, the capacity utilization index includes accommodation and coastal component of the total count, but even so this index is below the average value in the country. The employment index manages to exceed even 35% in 2012 (Table 2) in high season, but hide the fact that accommodation is closed in winter [5].

Table 2. Use index of accommodation capacity in Managalia from 2010 to 2014

Year	Use index of accommodation capacity (%)
2010	30%
2011	33%
2012	37%
2013	35%
2014	35%

Source: National Institute of Statistics, Department of Statistics Constanța

In Fig. 2 is presented the evolution of the accommodation capacity index. The highest capacity index was recorded in 2012, approximately 37% and 35% in 2013 and 2014. This indicator hides the attractiveness of the seaside in winter due to the lack of alternative solutions based on both on the sea and the natural resources of the sea [6].

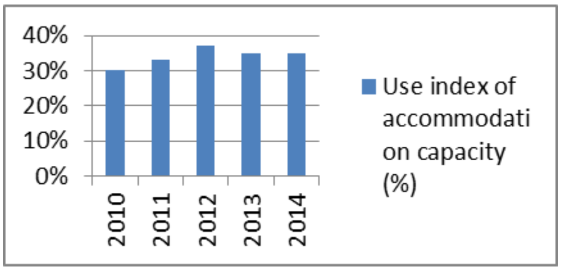

Fig. 2. Evolution of the use of accommodations in Mangalia
Source: Own determination.

Of the total arrivals in Mangalia, only 2% of tourists have treatment tickets, this being due to the related resorts that have a much larger clientele in summer. However, the number of tourists who have treatment tickets does not decrease. In Table 3 it is presented the ticket number 5,200 settled in 2012 and 2014 a total of 4,900 tickets. Fig. 3 shows the evolution of the number of discounted tickets during the three years [5].

Table 3. Number of tickets settled from 2012 to 2014

Year	Number of tickets settled
2012	5,200
2013	4,800
2014	4,900

Source: National Institute of Statistics, Department of Statistics Constanța

If Mangalia would provide alternative leisure and would develop products like thalassotherapy and complete spa in winter, it could become a tourist destination that can extend the season as such and the stay of tourists in the low season [6].

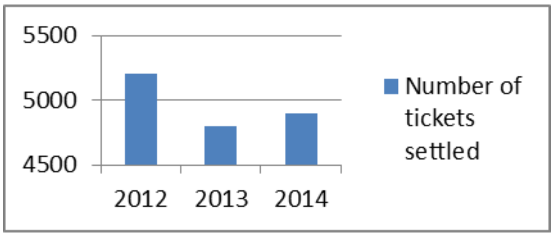

Fig. 3. The evolution of treatment vouchers settled in Mangalia, 2012-2014
Source: Own determination.

By treatment tourism, tourists satisfy their needs such as: feeling good both physically and mentally, they begin to know and better understand various physical problems, begin to adopt a new lifestyle and why not a catering much healthier [8]. The average stay is 12-18 days customers.

The customer categories have the following structure: 35% retired, people with secondary education 25%, persons with higher education 25%, 5% artists and athletes, other trades 0.5% (Table 4) [5].

Tourists choose to practice this form of tourism because many of them suffer from various diseases and follow treatments once or twice a year at the doctor recommendation.

Table 4. Structure categories of customers in Mangalia

Customers	%
Retirees	35
Frames with secondary	25
Frames with higher education	25
Artistes and Athletes	5
Other trades	0.50

Source: National Institute of Statistics, Department of Statistics Constanța

Tourists entering the nursing home follow a particular treatment and spend much time inside it, because they want to recover their staying but also to establish social relationships with other people [9].

CONCLUSIONS

The study provides a number of general conclusions as presented below:

Spa tourism is a tourism constant form of movement, a major segment in tourism due to the presence of curing factors. It is addressed not only to people with medical problems but also those who want to relax or rest. It is based on a permanent potential that can be practiced throughout the year.

Natural healing factors are: climate, natural mineral waters, therapeutic muds, therapeutic gases.

The seashore therapeutic factors are: beach, sea baths, sunlight, mud, mineral springs in Mangalia.

Mangalia Sanatorium is a specialized medical unit established in 1975. It comprises two pavilions: A Pavilion and B Pavilion.

Mangalia is visited by tourists four months a year (June, July, August, September), and the rest of the year many of accommodation units are closed. Tourists vacationing in Mangalia are both Romanians and foreigners.

The number of tourists in Mangalia fluctuated from 210,000 in 2010 to 240,000 in 2014.

The average length of stay is 5 days sanatorium, like in the rest of spas in the country. Of the total arrivals in Mangalia, only 2% of tourists have treatment tickets.

The customer categories have the following structure: 35% retired, people with secondary education 25%, 25% with higher education, artists and sportsmen 5%, 0.5% other professions.

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"PAULOWNIA SPECIES" GROWING FOR SAPLINGS IN POTS IN ROMANIA: TECHNOLOGICAL ASPECTS AND COMPARATIVE EXPENSES, INCOMES AND PROFIT

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Abstract

The paper aimed to comparatively analyze the economic efficiency of Paulownia Species, Shan Tung variety, grown for producing 10,000 saplings in pots at SC Galya 3000 SRL, Cerneteaz Commune, Timis County, Romania in the year 2016. The research includes three alternatives for producing 10,000 saplings in pots as follows: V1- saplings in pots 7x7x8 cm, V2- saplings in pots of 19 cm, and V3-saplings in pots of 36 cm. In case of V3, the production cost for 8 months to produce saplings of 1-1.5 m height in a pot of 36 cm was Lei 8.95, 2 times higher compared to V2, where the cost per sapling of 50 cm in a pot of 19 cm was Lei 4.06 and 7.16 times higher than in case of V1, where the cost per sapling of 4 cm in a small pot of 8 cm was Lei 1.25. The income is 6 times higher in case of V3 compared to V1 and 2 times higher compared to V2, and as a consequence, the gross profit increases from V1 to V3, while the profit rate decreases from 300.14 % in case of V1 to 235.04 % in case of V3. Therefore, the profit rate is enough high to consider Paulownia growing a real business for all the three variants. As a final conclusion, Paulownia tree growing is a real business for farmers interested to get income and profit in a short period of time varying from1.5 months to 8 months. Also, the plants could be grown in plantations for fuel and furniture wood whose price is much higher if the wood is sold in the international market.

Key words: *economic efficiency, growing, Paulownia Species, Shan Tung variety, saplings in pots*

INTRODUCTION

Paulownia Sp. has its origin in China, where about 2,600 years ago it was used for timber. At present, the plant is largely spread in China, Vietnam, Laos, Japan, Korea, in general in Asia, but also it is cultivated in Australia and America.

The name of *Paulownia* was given in honour of Anna Paulowna, Queen consort of the Netherlands (1795–1865), daughter of Tsar Paul I of Russia. For this reason, the plant it is named "princess tree".

From a botanical point of view, it belongs to the "*Pauloniaceae family*", consisting of a large number of species. At present, there are many *Paulownia* species, among the most important being: P. tomentosa, P. fortunei, P. elongata, P. albiphloea, P.catalpifolia, P. australis, P. kawakamii, P. taiwaniana, P. fargesii, P. glabrata [8].

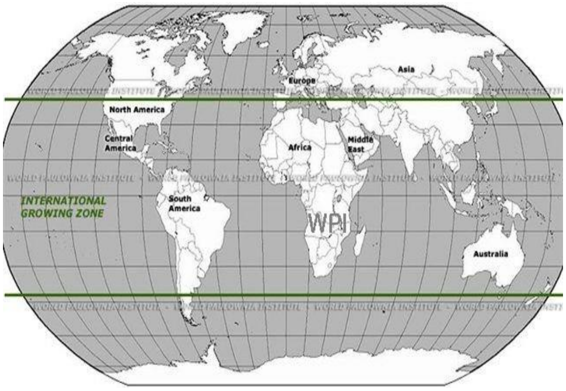

Fig.1.World zones where *Paulownia* is grown
Source: http://www.worldpaulownia.com/international-map/ [14]

The species are able to adapt easily to different climate and soil conditions. But the plant has better results when it is cultivated on fertile soils, deep lose sandy soils. The only condition is as the water table to be deeper than 1.5 m. Also, the optimum temperatures for *Paulownia* growing are ranging between - 20 and + 45 Celsius degrees. However, the plant requires a lot of water to grow well and mainly in the warm seasons, because the tree has a high transpiration rate.

It is a fast growing tree, at the age of 6-7 years reaching about 15 meters height and the age of 10 years it has about 30-40 diameter and 0.3-0.5 m^3 volume of timber. The timber is strong and dries easily, its grain is fine and it is resistant to deformation, cracking or wrapping.

For this reason, the *Paulownia* tree has a large range of uses, being cultivated for the following purposes: (i)fuel wood, (ii) furniture of high quality, plywood and musical instruments (guitars etc), wood for planes and ships, because the word can be easily carved, (iii) for intercropping in agriculture, as it is able to develop a suitable climate for agricultural crops increasing yields, (iv) an organic fertilizer because the leaves are rich in Nitrogen, (v) the leaves can be also used as animal fodder, (vi) fuel pellets for heating, (vii) the flowers are rich in nectar completing the picking alternatives for bee families and contributing to an increased honey production, (viii) for landscape architecture in the urban and rural areas, (ix) for protecting rods, farms, houses etc, against wind and snow storms, (x)for reclamation of the areas affected by mining, (xi) for the afforestation of various areas where forests were cut or are insufficient, (xii) the flowers and leaves have medicinal properties. [11, 15]

The *Paulownia* leaves contain: protein 22.6 %, Organic matter 91.4 %, Phosphorus 0.6 %, Calcium 2.1 %, Iron 0.6 %, Zinc 0.9 %, 7.8 % ash, metabolizable energy 15-18 MJ/kg. [3]

The *Paulownia* wood is surnamed "the wood aluminum". About 2 thirds of a tree could be used for timber, and one third for biomass for producing green energy. The price of one cubic meter of timber is about Euro 500. [9]

Paulownia can be multiplied from seeds, roots or stem cuttings. In order to produce genetically uniform clones of high quality for agro-forestry, micropropagation techniques are largely applied by various researchers [1, 5].

Another important method for Paulownia propagation is seedlings production.

The seeds are very small. In one gram of seeds there are 2,666-3,333 seeds, or 1,000 seeds weigh 0.17-0.25 g depending on variety. The seeds germination rate also depends on hybrid and ranges between 70 % up to 90 %.

In Romania, the researches on *Pawlonia Sp.* started since 1984-1986 for finding possibilities to produce wood with special uses and reduce wood import. [10]

In the last decade, *Pawlonia Sp.* was cultivated on various surfaces in different regions of Romania. At present, *Pawlonia* growing for saplings and wood has become a real business.

Paulownia tree has a special chemical composition and a high energetic value, a reason to be suitable to produce bioetanol in Romania. [7]

In Romania, the Shan Tong hybrid, which is a selected clone resulted from the combination of two species: P. tomentosa x P. fortunei, has started to be recently cultivated. Its main qualities are: the well developed saplings of one year old which can be easily planted directly in the field and the high quality of timber plantations, as the tree lignifies faster.

In Romania, other researches on *Paulownia* trees were done in nurseries created in greehouses and in the field at ICAS Ștefănești, Simeria and Hemeiuș, Transilvania, [2] and the behaviour of the plantation of *Paulownia tomentosa* created based on pot seedlings was also studied. [4]

În 2014 there were created *Paulownia* plantations over 100 hectares in 10 counties of Romania (Timiş, Constanţa, Galaţi, Teleorman, Călărași, Sălaj, Cluj, Satu Mare, Sibiu, Suceava, and Bihor. [6]

In Romania, the cities Baia Mare, Cluj-Napoca, Băile Herculane, Timisoara, Arad, București, Buzău, Horezu-Mănăstire, Govora Băi, Caracal, Craiova, Miniș, Slatina, Tîrgu Jiu,Vaslui have old *Paulownia trees* whose age varies between 30-50 years. [13]

In this context, the objective of the paper was to present three business alternatives of

Paulownia production as saplings in pots and the related costs, income, profit and profit rate to prove that this tree could be a big deal for the Romanian farmers.

MATERIALS AND METHODS

The experiments were carried out at the firm SC Galya 3000 SRL [12], situated in Cerneteaz Commune, Timis County, in the West part of Romania. The period of experiments lasted 8 months from February till September 2016.

The *Paulownia* hybrid used in this experiment was Shan Tung variety, imported as phytosanitary certified seeds from China.

A number of 10,000 saplings were considered the goal of the experiment.

The project designed in this research includes three alternatives for producing 10,000 saplings in pots as follows: V1- saplings in pots 7x7x8 cm, V2- saplings in pots of 19 cm, and V3-saplings in pots of 36 cm.

For each experimental variant, it was presented the production technology and the related costs, income, profit and profit rate.

The results for the three variants were comparatively analyzed regarding this indicators.

RESULTS AND DISCUSSIONS

The calendar for producing *Paulownia* plants was the following one: *February* was the month when the experiments started. The small seeds were put into cell trays in a special room where the temperature was about 27-28 Celsius degrees. After germination, in maximum 10 days from sowing, the small plants have appeared. The germination rate was 75 %, therefore 25 % seeds were lost. In *March,* at the age of 1-1.5 months, the plants reached about 4 cm height, when they were transferred from the cell trays into small pots of 7x7x8 cm. About 16.66 % losses were recorded after the plant transfer in small pots. In *April,* the plants continued to grow and in *May,* they reached 10 cm height. From this moment, there are two alternatives to use the small plants: (a) to move the plants of 10 cm height and 1-1.5 cm diameter in a *Paulownia* nursery, and (b) to transfer the plants from the small pots 7x7x8 cm into pots of 19 cm. In ors experiments, the small plants were moved into pots of 19 cm. In *June and July,* the plants growth continued so that in *August*, they reached 50 cm height. In *September*, the plants could be used in four directions: (i) to be moved from the post of 19 cm into post of 36 cm and continue their growing or to be sold as such on the market, (ii) to be moved in larger pots of 50 cm when they have 60 cm height; (iii) to be planted directly in the field in pits of 0.8-1 m depth; (iv) to remain to be grown in pots of 19 cm till December. In this experiment, the plants were transferred from small pots of 19 cm into pots of 36 cm in order to be sold as such in the market.

V1-Producing 10,000 saplings in small pots 7x7x8 cm.

Seeds. The average number of seeds used in this variant was 3,000/g. For producing 10,000 saplings in small pots, it was needed 16,000 seeds imported from China, as phytosanitary certified seeds. It was needed to take into account that the sprouting rate is 75 % and at the transfer of the plants from cell trays into pots of 7x7x8 cm, there are 16.66 % plant losses. Therefore, 5.4 g of seeds were bought at the price of USD 2.66/g (all taxes included). The cost of seeds acquisition totalized USD 14.36, or, at an exchange rate 1 USD= Lei 3.95, this meant Lei 56.72.

Cell trays. The seeds are put into special cell trays. In this experiment there were used the trays with 104 cells, whose price is Lei 1.7/tray. Therefore, for sowing 16,000 seeds, there were needed 154 trays, whose total cost was Lei 261.8.

Sprouting substratum is represented by TS 3 peat, which has a fine granulation (0-7 mm) and ph= 5-5.5. This sort of peat is imported from Lithuania. To fill the 104 cells of a tray, it is needed 500 g peat, therefore for all the 154 trays it was needed the amount of 77 kg peat. Peat is commercialized in sacks of 200 liters (equivalent to about 50 kg peat) and the price is Lei 63/sack. Therefore, two sacks of peat are enough and their cost is Lei 126.

After sowing, the small plants of 1 cm height will appear in 10 days and they will continue their growth till they reach 3-4 cm height at the age of 1-1.5 months.

Photo 1. *Paulownia* seedlings in a cell tray.
Source: Original photo.

Watering is compulsory to help the sprouting process and plants to grow. For 50 plants, its i needed 2 liters water/one watering and 3 waterings are enough per week at this stage of vegetation. To water 16,000 seeds and seedlings it is required an amount of 1,920 liters (1.92 m^3) water, which is supplied at the price Lei 4.50/ m^3. Therefore, water cost is Lei 8.64.

The water needs to be assured by a Submersible Pump QDX 1.4 32 M, 1.4 KW engine power and 5,000 liters/hour (5 m^3) water flow. The pump price is Lei 239. For pumping 1,920 liters water, it is consumed 0.53 KW and taking into account the price of electricity Lei 0.2734/KWh, this means Lei 0.15 expenses.

Biostimulation for germination and growth. At the same time with the water assurance, it is needed to apply Atonik biostimulator (1 ml/1 liter water), more exactly 2 liters for the whole amount of water 1,920 liters. The price of biostimulator is Lei 165.7/liter, therefore, the two liters cost was Lei 331.4.

Heating in spring season. When it is cold outdoors, like in February and March, in the room where the plants are grown in cell trays, it is needed to assure 27-28 Celsius degrees for germination and plant growth. In this purpose, an electric heater of 2,000 W, with a consumption of 48 KW/day is needed for a period of about 45 days when the plants are in this stage of vegetation. For the whole period, the electricity consumed by heater totalize 2,160 KWh, and at the price Lei 0.2734/KWh, this means Lei 590.50 total cost with heater electricity consumption.

Labor force required to fill the 154 trays with peat, to sow the seeds and wet the plants is represented by one permanent employee for the duration of 45 days and one worker working only 7 days for filling the cell trays with peat and 2 days for sowing the seeds. At a tariff of 100 lei/working day, the total labor cost accounted for Lei 5,400.

Transfer of 12,000 small plants from cell trays into small pots 7x7x8 cm. Taking into account that the germination rate is 75 %, therefore 4,000 plants were lost 925%), only a number of 12,000 plants will be moved into small pots.

(a)*The acquisition of the 12,000 small pots* 7x7x8 cm at the price Lei 0.08/pot, lead to Lei 960 total cost.

(b)*The substratum in small pots,* was represented by 14 sacks of TS 3 peat, bought at the price Lei 63/sack of 200 liters. Therefore, the total cost with peat substratum in small pots is Lei 882.

(c)*Watering the plants in small pots* needed 7,200 liters water, whose cost was Lei 32.4, considering that a plant in a pot must receive 150 ml water two times a week for a period of two weeks.

(d)*The Atonik biostimulator* was also used to help plant growth in small pots, in the same concentration ratio (1 ml biostimulator/1 liter water). For the amount of 7,200 liters of water required to wet the plants, the related cost with Atonik biostimulator accounted for Lei 1,205.7.

(e)*The submersible pump* has to operate 3.6 hours to assure the needed water volume, and this means 5.04 KWh and electricity cost is Lei 1.38.

(f)*The labor force* required to transfer the small plants from cell trays into small pots 7x7x8 cm is represented by 4 workers who must work 6 days for a tariff of Lei 100/working day, totalizing Lei 2,400 labour cost. The number of working days was established taking into account that a worker is able to transfer only 500 plants/working day from cell trays into small pots.

The expenses related to the production technology for producing 10,000 *Paulownia* saplings in pots 7x7x8 cm are presented in Table 1.

Table 1. The expenses related to the production technology for producing 10,000 *Paulownia* saplings in pots 7x7x8 cm

Crt. No.	Cost item	Total Expenses (Lei)
	MATERIALS	
1	Seeds	56.72
2	Cell trays	261.80
3	Small pots 7x7x8 cm	960.00
3	Peat substratum, of which: -for sprouting in cell trays -in small pots 7x7x8 cm	1,008.00 126.00 882.00
4	Watering, of which: -seeds and plants in cell trays -plants in small pots 7x7x8 cm	41 .04 8.64 32.40
5	Submersible pump 1.4 KW, 5 m^3/h	239.00
6	Atonik biostimulator, of which: - for seeds and plants in cell trays -for plants in small pots 7x7x8 cm	1,537.10 331.40 1,205.70
7	**TOTAL MATERIALS**	**4,103.66**
8	SERVICES WITH THIRDS	
9	Electricity, of which: -for pumping water for seeds and plants in cell trays -for heating in spring season -for pumping water for plants in small pots 7x7x8	592.03 0.15 590.50 1.38
10	**TOTAL SERVICES WITH THIRDS**	**592.03**
11	LABOR	
12	Labor force, of which: -for working with seeds and plants in cell trays -for working with plants in small post 7x7x8 cm	7,800 5,400 2,400
13	**TOTAL LABOR**	**7,800**
14	**TOTAL PRODUCTION EXPENSES**	**12,495.69**

Source: Own calculation

Therefore, for producing 10,000 saplings in small pots of 7x7x8 cm, the production costs are Lei 12,495.69, of which the expenses with the required materials represent 32.84 %, the labor costs represent 62.42 % and the cost with the thirds for electricity delivery represent 4.74 %.

V2-Producing 10,000 saplings in pots of 19 cm diameter

Seeds. In this case, it is needs to start with 16,900 seeds, which at a germination rate of 75 % will led to 12,675 small plants in cell trays. After the transfer from cell trays into small pots of 7x7x8 cm, 2,112 plants (16.66%) will be lost. Taking into account that after the transfer from small pots 7x7x8 cm into pots of 19 cm, the loss of plants is small, more exactly 5.34 % (563 plants), finally, 10,000 saplings at a height of 50 cm in pots of 19 cm could be sold in the market.

Therefore, the 16,900 seeds means 5.63 g seeds, which are bought at the price USD 2.66/g. This means USD 14.98 or, at the exchange rate of 1 USD=Lei 3.95, this means Lei 59.17, total cost with the seeds acquisition.

Cell trays. For 16,900 seeds it is needed 163 trays (a tray with 104 cells), which are bought at the price Lei 1.7 lei/tray. Therefore, the acquisition of all the trays totalizes Lei 277.1.

Substratum for germination and plant growth. In this purpose, it is used TS 3 peat (0-7 mm granulation), ph= 5-5.5, imported from Lithuania. The amount of peat to fill the cells of a tray with 104 cells is 500 g peat. Therefore, for 163 trays it is needed 81.5 kg peat. Because, it is known that a sack of peat has 200 liters (50 kg), it is needed to buy 2 sacks and at the price Lei 63/sack, the total cost with peat acquisition is Lei 126.

Watering. It is known that for 50 plants in this stage it is needed 2 liters water/watering and 3 times a week, totalizing 6 liters. For 16,900 seeds and plants, it is needed 2,028 liters water, at the price Lei 4.50 m^3, this means Lei 9.14 watering cost.

Submersible pump QDX 1.4 32 m, 5 m^3/h water flow costs Lei 239.

Electricity for water pumping. Taking into account that the pump has 1.4 KW power and gives 5,000 liters/hour, it is needed 2,028 liters water to be pumped, and this means 0.57 KWh electricity consumption. At the tariff Lei 0.2734/KWh, this means Lei 0.16 cost with electricity.

Biostimulation for germination and growth. For V2**,** it is needed to apply Atonik biostimulator (1 ml/1 liter water), more exactly 2 liters for the whole amount of water 2,028 liters. The price of biostimulator is Lei 165.7/liter, therefore, the two liters cost was Lei 331.4.

Heating in spring season. Taking into account that, the electric heater of 2,000 W will operate daily in February, March and April, that is 89 days, this means 4,272 KW consumed and at the tariff Lei 0.2734/KWh, this means Lei 1,168, heating cost.

Labor force. For filling the 163 trays with peat and taking care of plants from February to May, that is 89 days, it is needed one permanent employee and one worker to fill the 163 trays with 81.5 kg peat in 2.5 days and to put 2,500 seeds/day in trays, he needs about 7 working days. At the tariff Lei 100/day, the total labor cost accounts for Lei 9,850.

Transfer of 12,675 small plants from cell trays into small pots 7x7x8 cm.

(a)*The acquisition of the 12,675 small pots* 7x7x8 cm at the price Lei 0.08/pot, lead to Lei 1,014 total cost.

(b)*The substratum in small pots,* was represented by 14 sacks of TS 3 peat, bought at the price Lei 63/sack of 200 liters. Therefore, the total cost with peat substratum in small pots is Lei 882.

(c)*Watering the plants in small pots.* Knowing that a plant receives 150 ml water 2 times a week, and the duration of watering is 8 weeks from the middle of March to the middle of May, this lead to 2.4 liters/plant in pot and multiplied by 12,675 pots (plants), it totalizes 30,420 liters water, i.e. 30.42 m^3, and the tariff Lei 4.5/ m^3, it results Lei 136.89 watering cost.

(d)*The Atonik biostimulator* for plants in small pots is used to help plant growth, in the same concentration ratio (1 ml biostimulator/1 liter water). For the amount of 30,420 liters of water required to wet the plants, the related cost with Atonik biostimulator accounted for Lei 5,059.30, because there were bought 30 liters at the price Lei 165.70 /liter and 500 ml Atonik at the price Lei 88.30/dose of 500 ml.

(e)*The electricity consumption made by the submersible pump.* Knowing that the pump of 1.4 KW provides 5,000 liters/hour, for 12,675 plants and for a period of 8 weeks, it is needed the amount of 30,420 liters water. In this purpose, the pump must operate 6.084 hours, consuming 8.52 KWh and at the tariff Lei 02.734/KWh, the total cost with electricity for pumping is Lei 2.33.

(f)*The labor force* required to transfer the small plants from cell trays into small pots 7x7x8 cm is
represented by 4 workers who are able to transfer 500 plants/working day, this means about 6.5 working days and at the tariff Lei 100/day, the total labor cost is Lei 2,600.

Transfer of the plants of 10 cm height from small post 7x7x8 cm into pots of 19 cm

(a)*The acquisition of the 12,675 pots of 19 cm* at the price Lei 1.01/pot, lead to Lei 12,801.75 total cost.

(b)*The substratum for plants in pots of 19 cm* is a mixture consisting of manure, sand, perlit, peat with big granulation and garden ground. For the 12,675 pots, there were required the following amounts of these components of the mixture: 2,281.50 kg manure, 1,267.5 kg sand, 126.75 liters perlit, 633.75 kg peat and 633.75 kg garden ground. As a consequence, there were bought:

(i)156.1 sacks manure at the price Lei 10/sack, meaning Lei 1,521 manure cost;

(ii) 0.75 m^3 sand at the price Lei 40/ m^3 sand, meaning Lei 30;

(iii) 2 sacks of perlit at the price Lei 85/a sack of 100 liters, meaning Lei 170;

(iv) 51 sacks of peat at the price Lei 20.24/ an Agro CS sack of 50 liters, meaning Lei 1,032.24;

(v) 13 sacks of garden ground of 50 kg each at the price Lei 23/sack, meaning Lei 299. Therefore, the total expenses with the substratum mixture needed to fill the 12,675 pots of 19 cm account for Lei 3,052.24.

(c)*Labor for transferring the plants from small pots 7x7x8 cm into pots of 19 cm.* Because 2,000 plants/working day could be transferred by 4 workers, there are needed 6.5 working days and the tariff per day is Lei 100/person. In this case, the labor cost for this operation account for Lei 2,600.

(d)*Watering the plants in pots of 19 cm.* In this purpose, it is needed a Kärcher sprinkler with a complete rotation, PS 300, 703 m^2, with a sprinkling ray 30 m, and water flow 18 liters/min (1,080 liter/hour). The sprinkler price is Lei 66.59/piece. Arranging the pots in a squared shape, 113 pots of 19 cm on the side of the square and 114 pots on the other side, the surface covered by the 12,675 pots of 19 cm totalize 465 m^2. In this case, the sprinkler is placed in the middle of the square with pots.

Table 2. The expenses related to the production technology for producing 10,000 *Paulownia* saplings in pots of 19 cm

Crt. No.	Cost item	Total Expenses (Lei)
	MATERIALS	
1	Seeds	59.17
2	Cell trays	277.1
3	Small pots 7x7x8 cm	1,014
4	Pots of 19 cm	12,801.75
5	Peat substratum, of which: -for sprouting in cell trays -in small pots 7x7x8 cm	1,008.00 126.00 882.00
6	Substratum mixture for plants in pots of 19 cm, of which: -manure -sand -peat -perlit -garden ground	3,052.24 1,521 30 1,032.24 170 299
7	Watering, of which: -seeds and plants in cell trays -plants in small pots 7x7x8 cm -plants in pots of 19 cm	437.63 9.14 136.89 291.60
8	Submersible pump 1.4 KW, 5 m^3/h	239.00
9	Sprinkler PS 300, 703 m^2, 30 m sprinkling ray, 18 liters/min water flow	66.59
10	Atonik biostimulator, of which: - for seeds and plants in cell trays -for plants in small pots 7x7x8 cm	5,390.70 331.40 5,059.30
11	**TOTAL MATERIALS**	**24,346.18**
12	SERVICES WITH THIRDS	
13	Electricity, of which: -for pumping water for seeds and plants in cell trays -for heating in spring season -for pumping water for plants in small pots 7x7x8 -for pumping water for the plants in post of 19 cm	1,175.46 0.16 1,168.00 2.33 4.97
14	**TOTAL SERVICES WITH THIRDS**	**1,175.46**
15	LABOR	
16	Labor force, of which: -for working with seeds and plants in cell trays -for working with plants in small post 7x7x8 cm -for working with plants in pots of 19 cm	15,050 9,850 2,600 2,600
17	**TOTAL LABOR**	**15,050**
18	**TOTAL PRODUCTION EXPENSES**	**40,571.64**

Source: Own calculation

The water amount used to wet the 12,675 post of 19 cm was calculated taking into consideration that the sprinkler water flow 1,080 liters/hours, the need to wet the plants for two hours and three times a week for a period of 10 weeks. This totalize 64,800 liters or 64.8 m^3 and at the tariff Lei 4.5/ m^3, it results Lei 291.6 water cost.

The 64,800 liters water are pumped by the pump of 1.4 KW and 5,000 liters/hour water flow, meaning that there are required 13 hours. In this case, the electricity consumption is 18.2 KWh and at the tariff Lei 0.2734/KWh, it results Lei 4.97 electricity cost for pumping.

Therefore, the total expenses with watering the pots of 19 cm account for Lei 363.16.

As mentioned at the beginning of the V2 presentation, during the growth of plants in post of 19 cm, it is recorded a loss of 5.34 % plants, that is 563, finally, remaining 10,000 saplings at a height of 50 cm in pots of 19 cm to be sold in the market

The expenses related to the production technology for producing 10,000 *Paulownia* saplings in pots of 19 cm are presented in Table 2.

Therefore, for producing 10,000 saplings in small pots of 19 cm, the production costs are Lei 40,571.64, of which the expenses with the materials represent 60.00 %, the labor costs represent 37.09 % and the cost with the thirds for electricity delivery represent 2.01 %.

V3-Producing 10,000 saplings in pots of 36 cm diameter. All the technological and economical aspects of V2 are available for V3 till the moment of saplings transfer from the pots of 19 cm into the pots of 36 cm diameter.

The plants of 50 cm height at the age of 4 months in the month of May are transferred from the pots of 19 cm into pots of 36 cm, where they are grown till they attains 1-1.5 m height at the age of 8 months, that is at the end of August, and the beginning of September.

(a)*The acquisition of the 10,000 pots of 36 cm* at the price Lei 3.3/pot, means Lei 33,000 total cost.

(b)*The substratum for plants in pots of 36 cm* is represented by the same mixture consisting of manure, sand, perlit, peat with big granulation and garden ground used in case of V2.

For the 10.000 pots of 36 cm, there are required the following amounts of these components of the mixture: 2,700 kg manure, 1,500 kg sand, 150 liters perlit, 750 kg peat and 750 kg garden ground. As a consequence, there bought:

(i) 180 sacks manure at the price Lei 10/sack, meaning Lei 1,800 manure cost;

(ii) 0.89 m^3 sand at the price Lei 40/ m^3 sand, meaning Lei 35.6;

(iii) 2 sacks of perlit at the price Lei 85/a sack of 100 liters, meaning Lei 170;

(iv) 60 sacks of peat at the price Lei 20.24/ an Agro CS sack of 50 liters, meaning Lei 1,214.4;

(v) 15 sacks of garden ground of 50 kg each at the price Lei 23/sack, meaning Lei 345.

Therefore, the total expenses with the substratum mixture needed to fill the 12,675 pots of 19 cm account for Lei 3,565.

(c)*Labor for transferring the plants from pots of 19 cm into pots of 36 cm.* Because only 240 plants/working day may, this means that all the 10,000 plants will be transfer in about 42 days. But, normally, this operation must be done in maximum one week.

For this reason, there are needed 6 workers, who are able to move 1,440 plants per day and in 7 days to finish the whole number of pots.

The total expenses for 1 permanent worker working 4 months (May, June, July and August) and for other 5 workers totalize Lei 11,900 for a tariff of Lei 100 for working day.

(d)*Watering the plants in pots of 36 cm.*

The arrangement of pots to be wet could be made in a square shape as in case of the pots of 19 cm. If we put 100 pots on one side of the square and other 100 pots on the other side, the surface of the square occupied by 10,000 pots of 36 cm is S= 1,296 m^2.

But we have to take into account that the plants have more leaves, the vegetative mass is larger and larger, and at a moment they need more space to develop. In his case, it is required a larger surface of irrigation.

But, even under this condition, it is known that a plant in a pot of 36 cm needs about 2 liters water a day and 3 waterings a week for a period of 16 weeks (4 months) from May to the end of August.

Therefore, for the whole period of time, a plant in a pot of 36 cm needs 96 liters water, and for the 10,000 saplings it is required 96,000 liters or 96 m^3, which at the tariff Lei 4.5/ m^3, means Lei 432 water cost.

Having in mind, that it is needed as water to cover a surface larger than 1,296 m^2, it is not enough only one sprinkler.

In this case, it is required to buy an additional Kärcher sprinkler, PS 300, 703 m^2, with 30 m sprinkling ray, and 18 liters/min (1,080 liter/hour) water flow. The sprinkler price is Lei 66.59/piece at the market price.

The 96,000 liters water must be supplied by the pump of 1.4 KW and 5,000 liters/hour water flow, meaning that there are required 19.2 hours.

In this case, the electricity consumption is 26.88 KWh and at the tariff Lei 0.2734/KWh, it results Lei 7.35 electricity cost for pumping.

Therefore, the total expenses with watering the pots of 36 cm account for Lei 505.94.

Photo 2. *Paulownia* saplings of 50 cm height in pots of 36 cm.
Source: Original photo.

The expenses related to the production technology for producing 10,000 *Paulownia* saplings in pots of 36 cm are presented in Table 3.

Table 3. The expenses related to the production technology for producing 10,000 *Paulownia* saplings in pots of 36 cm

Crt. No.	Cost item	Total Expenses (Lei)
	MATERIALS	
1	Seeds	59.17
2	Cell trays	277.1
3	Small pots 7x7x8 cm	1,014
4	Pots of 19 cm	12,801.75
5	Pots of 36 cm	33,000
5	Peat substratum, of which: -for sprouting in cell trays -in small pots 7x7x8 cm	1,008.00 126.00 882.00
6	Substratum mixture for plants in pots of 19 cm, of which: -manure -sand -peat -perlit -garden ground	3,052.24 1,521.00 30.00 1,032.24 170.00 299.00
7	Substratum mixture for plants in pots of 36 cm, of which: -manure -sand -peat -perlit -garden ground	3,565.00 1,800.00 35.60 170.00 1,214.40 345.00
8	Watering, of which: -seeds and plants in cell trays -plants in small pots 7x7x8 cm -plants in pots of 19 cm -plants in pots of 36 cm	869.63 9.14 136.89 291.60 432.00
9	Submersible pump 1.4 KW, 5 m^3/h	239.00
10	Sprinklers PS 300, 703 m^2, 30 m sprinkling ray, 18 liters/min water flow	133.18
11	Atonik biostimulator, of which: - for seeds and plants in cell trays -for plants in small pots 7x7x8 cm	5,390.70 331.40 5,059.30
12	**TOTAL MATERIALS**	**61,409.77**
13	SERVICES WITH THIRDS	
14	Electricity, of which: -for pumping water for seeds and plants in cell trays -for heating in spring season -for pumping water for plants in small pots 7x7x8 -for pumping water for the plants in pots of 19 cm -for pumping water for the plants in pots of 36 cm	1,182.81 0.16 1,168.00 2.33 4.97 7.35
15	**TOTAL SERVICES WITH THIRDS**	**1,182.81**
16	LABOR	
17	Labor force, of which: -for working with seeds and plants in cell trays -for working with plants in small post 7x7x8 cm -for working with plants in pots of 19 cm -for working with plants in post of 36 cm	26,950 9,850 2,600 2,600 11,900
18	**TOTAL LABOR**	**26,950**
19	**TOTAL PRODUCTION EXPENSES**	**89,542.58**

Source: Own calculation

Therefore, for producing 10,000 saplings in pots of 36 cm, the production costs are Lei 89,542.58, of which the expenses with the materials represent 68.58 %, the labor costs represent 30.09 % and the cost with the thirds for electricity delivery represent 1.33 %.

Photo 3. *Paulownia* at 1.5 m height at the age of 8 months
Source: Original photo.

Photo 4. *Paulownia* flowers.
Source: Original photo.

Photo 5. *Paulownia* tree plantation at one year age and the farmer Eng. Liviu Sabau, the owner of SC Galya 3000 SRL
Source: Original photo.

Photo 6. *Paulownia* tree at two years from planting.
Source: Original photo.

Table 4. The comparative economic efficiency in *Paulownia* growing for producing 10,000 saplings in pots in the three variants V1, V2 and V3

Indicator	V1- 10,000 saplings in pots of 7x7x8 cm	V2- 10,000 saplings in pots of 19 cm	V3-10,000 saplings in pots of 36 cm
Production costs (Lei)	12,495.69	40,571.64	89,542.58
Production cost per plant (Lei/plant in pot)	1.25	4.06	8.95
Sale price	5	15	30
Income from sold pots (lei)	50,000	150,000	300,000
Gross profit (Lei)	37,504.28	109,428.36	210,457.42
Profit rate (%)	300.14	269.72	235.04
Net profit (Lei)	31,503.60	91,919.83	176,784.24

Source: Own calculation

The comparative economic efficiency in *Paulownia* growing for producing 10,000 saplings in pots in the three variants presented in this paper is shown in Table 4.

CONCLUSIONS

All the three variants to produce 10,000 *Paulownia* saplings in pots are profitable. This aspect is important for the farmers interested to develop such a business.

In case of V3, the length of the plant growing is about 8 months, and the production cost are the highest ones, accounting for Lei 89,542.58. The production costs are 7.16 times higher than in case of V1 and 2.2 times higher than in case of V2.

The production cost per plant increases from V1 to V3. In case of V3, the farmer can pay Lei 8.95 to produce saplings of 1-1.5 m height in 8 months. The production cost is more than double in case of V2, when there are produced samplings in 4 months at 50 cm height, and 7.16 times higher than in case of V1, when a farmer could produce a plant of 4 cm height in 1-1.5 months.

The sale price is higher when the plants have a higher height and are commercialized in larger pots.

The income is 6 times higher in case of V3 compared to V1 and 2 times higher compared to V2.

Gross profit increases from V1 to V3, proving again that the plants with the highest height are more vigorous and better sold. The net profit has a similar increasing trend from V1 to V3.

The profit rate declines from V1 to V3, but it is enough substantial to prove that Pawlonia tree culture is profitable.

Therefore, as a final conclusion, farmers interested to grow *Paulownia* for saplings could get a substantial profit in 1.5 months, 4 months or 8 months.

Paulownia could be successfully grown in Romania for saplings in pot. Also, it could be sold as cut plants with roots which could be directly planted in the field to develop plantations for fuel wood and mainly for furniture wood which is required for export and the best paid.

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SOME CONSIDERATIONS ON THE DYNAMICS OF FRUIT AND APPLE PRODUCTION AND CONSUMPTION IN ROMANIA IN THE PERIOD 2007-2014

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Abstract

The purpose of the paper was to analyze apple contribution to fruit production and consumption in Romania. The main trends regarding the area with apple plantations, apple production, yield, consumption and price were studied, as well as Romania's position as producer and consumer of apples among the EU-28. Romania has 145.4 thousand ha covered by orchards of which 39.5% are apple tree orchards. Apple is on the top position with a share of 48 % in fruit output, which accounted for 1,115.2 thousand tons in 2014. Average apple consumption is 23.5 kg/capita, with a good self-sufficiency rate, compared to fruit consumption which is not satisfactory yet compared to other EU countries. Romania is an important fruit and mainly apple producer, coming on the 3rd position for the apple tree orchards area, on the 8th position for apple production and for the 9th position for apple consumption in the EU. An average consumption of 73.7 kg fruit/capita, meaning about 202 g of fruit/day, reflects that the Romanian population must eat more fruit according to the WHO recommendations. Due to the classic technologies applied on 64 % of the orchards plantations and only 36 % intensive plantations, apple price at the farm gate accounts for Euro 62/ton, being very high compared to other EU countries. Due to its high potential for fruit production, and especially for apple production, Romania's fruit sector must continue to growth and become more competitive under the condition as the small producers to join their efforts in associative forms allowing them to set up modern plantations, to obtain farm inputs at a lower price, to assure a modern infrastructure, to apply intensive and super-intensive growing technologies, to conclude commercial contracts with the beneficiaries and sell better their fruits, increasing the economic efficiency across the whole fruit chain. In this way, domestic production is encouraged and fruit imports can be diminished, better satisfying consumers' preference for Romanian fruits.

Key words*: apple, cultivated area, production, consumption, price, Romania*

INTRODUCTION

Fruit are very important for human diet because of their content in vitamins, minerals, antioxidants, carbohydrates, and acids, which help the organism to have a normal metabolism, to be healthy and protected against cancer, diabetes, heart diseases and cholesterol growth. [4].

Fruit and vegetables are recommended to be consumed daily in the amount of more than 400 g, divided into 5 portions of 80 g every day, of which 3 portions vegetables (240 g) and 2 portions fruit (160 g). [17, 19, 22, 26, 27]

Other authors recommend even more fruit and vegetables a day, 500-800 g. [7].

In Europe, fruit and vegetables consumption varies from a country to another. For instance, in Denmark, it is recommended more than 600 g a day [36].

In Europe, average fruit and vegetable consumption accounts for 386 g per day, of which main fruit intake is 166 g/day. However, fruit intake varies from a region to another, being higher in t**he** Central and Eastern European countries, followed by the Southern countries [13].

Only Poland, Germany, Italy and Austria respect the WHO (World Health Organization) recommendation to consume more than 400 g fruit and vegetables a day. In more than 50 % European countries, fruit and vegetable consumption is lower than 400 g/day and in 33 % countries the intake is smaller than 300 g/day [35].

The dietary habits are determined by a large range of factors such as: income, educational background [11], fruit and vegetable market price, awareness of healthy eating habits, gender (women eat more fruit and vegetables than men), age (the adults and old people consume more fruit and vegetables than the young people) [5, 16, 31], family factors, social factors [20], preferences, beliefs [29].

Apples are among the most common fruit consumed in the world besides bananas and oranges. The apple tree has its origins in the Caspian and the Black Sea region, proving that man consumed apples for more than 750,000 years [18].

From a botanical point of view, *Malus Domestica Borkh*, the cultivated apple tree, belongs to Rosaceae family, Pomoideae subfamily. Apple tree is suitable to be grown in various regions, in the hilly and also in the plain areas, on various soils and climate conditions, and in various range of technologies. It is very important for producing high nutritive and therapeutic value fruit [28].

The rich content in vitamins, minerals, and acids of the raw apple make it indispensable for a healthy body. The English saying "An apple a day keeps the doctor away" underlines its perennial importance since 1860s and later in 1922 when this proverb was launched [12, 34].

An apple 182 g weight (skin included) supplies 95 kcal, 19 g carbohydrates, 4 g dietary fiber and 195 mg Potassium [32].

The apple it is also rich in phenolics and flavonoids having an antioxidant effect on human body, protecting it against cancer [23, 33].

Apple trees are largely spread in the world, the North hemisphere supplying about 90 % of the world apple production. By continent, Asia comes on the 1st position (45%), being followed by Europe (23%) and North America (10%). China is the largest apple producer in the world.

Romania is among the top producers of apples in the EU both concerning the cultivated surface with apple orchards and apple production. The most important apple producers in the EU are France, Italy, Germany, Spain, Poland, Hungary and Romania.

About 3,500 domestic and also foreign cultivars are used in Romania to assure apple production in the market. Golden Delicious, Jonathan, Starkrimson, Jonagold, Idared, Prima, Florina, Romus 1, 2, 3, Generos, Pionier, Voinea, Frumos de Voineşti, Rădăşeni, Fălticeni, Roşu de Cluj etc are among the most important apple varieties cultivated in Romania.

About 77 % of apples are used as fresh fruit and 23 % are processed in natural juice, nectar, syrup, gem, marmalade, canned fruit, candies, ice cream, frozen fruit, dried fruit etc. [9, 25].

Apple quality depends on cultivars and it is perceived in a different way by consumers. Apple quality is given by a large variety of characteristics such as: size, shape, colour, skin, flavour, taste, juiciness, firmness etc, features which can be easily identified by consumers, and also quality depends on the growing applied technologies [1, 6, 30].

A recent study regarding consumer perception and preferences related to apple quality in close relationship to variety revealed that some Romanian consumers prefer to eat Braeburn, Golden Delicious and Jonagold apples, while other consumers does not like Granny Smith variety of apple. This is an alarm sign for the Romanian market which is invaded by imported apples. As long as the local apples are more tasty, flavoured and juicy, the demand/offer ration must be balanced in favour of the Romanian varieties well adapted to the local conditions. Also, it was not found any statistical correlation between apple quality and apple price, as a consequence of the average low income per household, a reason to buy apples or any other food to assure the lowest cost per the " daily food basket" [10].

Another research analyzed apple consumption habits in seven European countries on a sample of 4,271 respondents and found that there are important differences regarding apple intake in close relationship to consumer nationality. Poland was found with the highest apple consumption, as 55 % interviewed persons affirmed that they consume more than five apples a week. In the Italy, 39.3 % respondents consumed 3-5 apples a week, while the respondents from Netherlands and Spain recorded the lowest apple consumption. Concerning age, it was confirmed that the respondents older than 61 years prefer to eat more apples than the young ones [21].

In this context, the paper purpose was to analyze apple contribution to fruit production and consumption in Romania. In this purpose, there were identified the main trends of the cultivated surface with apple orchards, apple production and consumption, apple price. Also, it was studied Romania's position as producer and consumer of apples among the EU-28.

MATERIALS AND METHODS

The research was based on a large range of information sources, mainly the database provided on line by National Institute of Statistics, text books, scientific articles published in Romanian and international journals, press articles etc.

The analysis of the following indicators characterizing the fruit production, and especially apple production in Romania: orchards area, apple tree plantations area, fruit production, apple production, fruit and apple consumption, apple producer and consumer price.

These indicators were studied in their dynamics for the period 2007-2014, the data being collected from National Institute of Statistics Tempo-on-line data base.

The main methods used in this study were the following ones: index method, and also comparison method for reflecting the differences between the indicators level in Romania and other countries.

The results were tabled and graphically illustrated and interpreted.

RESULTS AND DISCUSSIONS

The dynamics of orchards area. The fruit tree plantations cover an important area of Romania representing about 1.4 % of the total agricultural land surface. The orchards area declined by about 30 % from 206 thousand ha in 2007 to 145.4 thousand ha in the year 2014.Therefore, in 7 years, many orchards have been destroyed, either because they were too old (over 30 years) and inefficient from an economic point of view due to the old technologies, determining a low fruit production and quality, or they could not be replaced by new modern plantations which have high costs. (Fig.1).

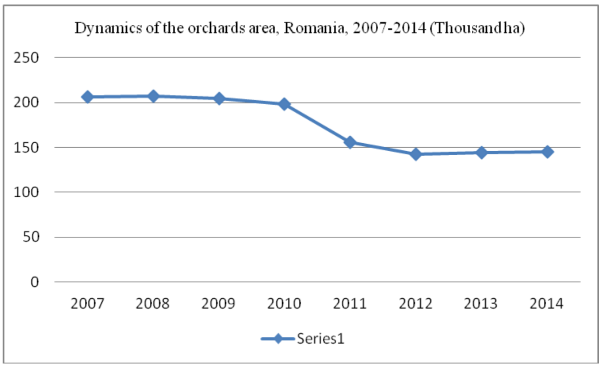

Fig.1. Romania's orchards area in the period 2007-2014 (Thousand ha)

Source: Own design based on NIS Tempo-online database 2015

Romania has the following age structure of the fruit trees plantations: 55% plantations older than 25 years, 25 % plantations between 15-24 years old, 13 % plantations between 5-14 years and just 7 % plantations are younger than 5 years.

Also, the density of plantations is not satisfactory. This is because about 64 % of the total number of fruit tree plantations are traditional plantations, 36 % are intensive plantations and zero % are super-intensive plantations. This situation does not make Romania a competitive country compared to other EU countries. This general situation also characterize apple orchards [2, 3].

The apple orchards registered a similar descending trend. However, the decline was only 6.2 % from 61.3 thousand ha in 2007 to 57.5 thousand ha in the year 2014.(Fig.2.).

The share of apple orchards in the total area covered by fruit tree plantations increased from 29.7 % in the year 2007 to 39.5 % in the year 2014. This was the consequence of the fact that other fruit tree species were more affected by the reduction of surface and the second reason is that apples give the most important contribution to fruit production.(Fig.3.).

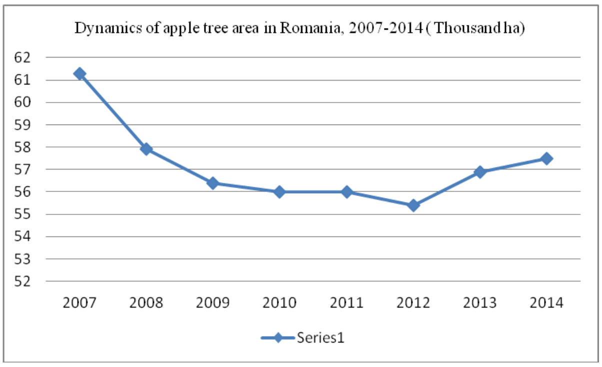

Fig.2. The evolution of Romania's apple tree orchards area in the period 2007-2014 (thousand ha)
Source: Own design based on NIS Tempo-online database 2015

Photo 1. Apples in apple trees plantation.

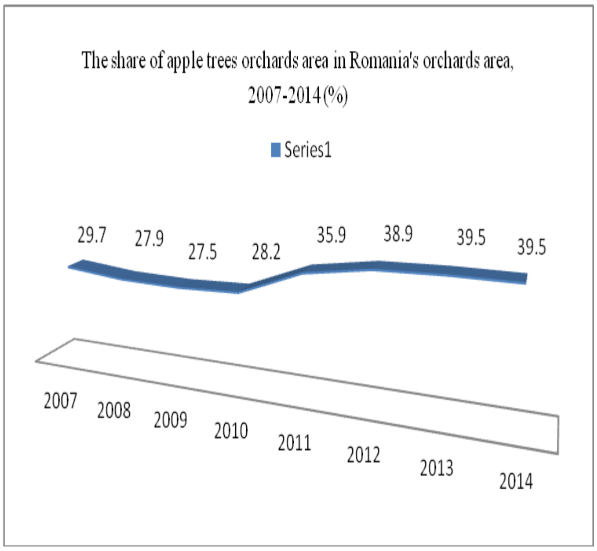

Fig. 3. The share of apple trees orchards area in Romania's orchards area, 2007-2014 (%)
Source: Own design based on NIS Tempo-online database 2015

The most orchards belong to individual householders and in general have a small size. About 49 % of apple orchards have less than 5 ha utilized agricultural area (UAA).

Regarding the surface with apple plantations, Romania comes on the 3rd position in the EU-28, according to [14]. Romania has 51,226 ha apple orchards, representing 3.97 % of the EU-28 apple orchards area, accounting for 449,629 ha.

Apple tree is the most important fruit tree in the EU-28 as its share in the orchards area accounted for 35 % in the EU-28 orchards surface in 2013.

The major countries with large surfaces of apple orchards are: Poland (143,113 ha), Italy (52,251 ha), Romania (51,226 ha), France (36,741 ha), Germany (31,739 ha), Spain (26,753 ha) and Hungary (25,265 ha). Due to the EU enlargement, in the period 2002-2012, the apple orchards area has become more than double.

The apple tree plantations in the EU have 449,629 ha, representing 34.86 % of the total area of all the plantations of fruit trees in the EU in 2013, when it accounted for 1,289,693 ha.

Among the most important apple varieties cultivated in the EU, there are: "Golden Delicious", with a share of 17.6% in the apple orchards area, "Idared" with 10.3 % and "Jonagold/Jonagored" with 9.3 % [16].

The fruit production. In Romania, the production of fruit increased by 2.7 % in the analyzed period, from 1,085.8 thousand tons in 2007 to 1,115.2 thousand tons in 2014(Fig.4.)

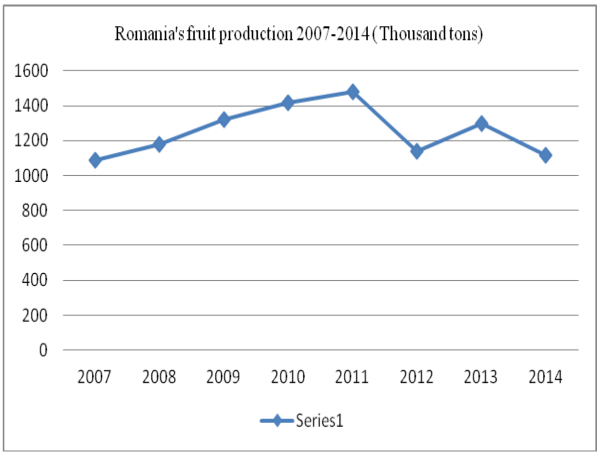

Fig. 4. The evolution of Romania's fruit production in the period 2007-2014 (thousand tons)
Source: Own design based on NIS Tempo-online database 2015

Photo 2. Fruit production

The apple production increased faster by 12.6 %, from 475.4 thousand tons in 2007 to 535.1 thousand tons in 2014. In this way, apple keeps the 1st position among the fruits produced in Romania. (Fig.5.)

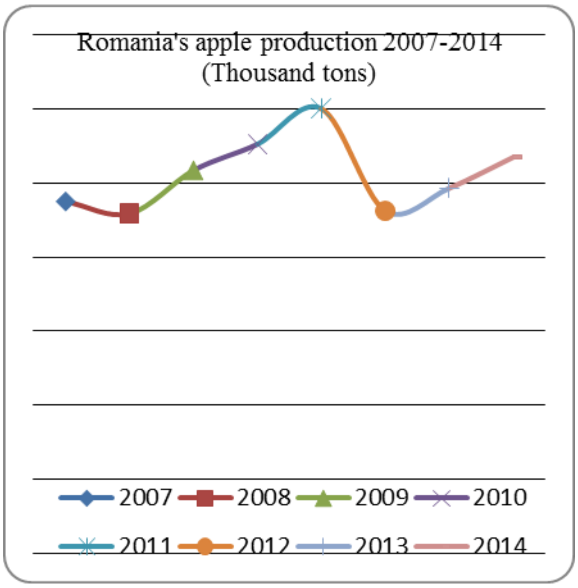

Fig. 5. The evolution of Romania's apple production in the period 2007-2014 (thousand tons)
Source: Own design based on NIS Tempo-online database 2015

In Romania, 92 % of fruit production and 85 % of apple production is supplied by the individual households. About 80 % of fruit production is represented by apples and plums [2, 3].

In 2014, the EU-28 produced 14,304 thousand tones apples. The main producing countries are Poland, Italy and France. With 503 thousand tons apples in 2014, Romania comes on the 8th position as an apple producer in the EU, after Poland (3,195 thousand tons, 22.3 %), Italy (2,454 thousand tons, 17.1 %), France (1,892 thousand tons, 13.2 %), Greece (1,533 thousand tons, 10.7 %), Germany (1,116 thousand tons, 7.8 %), Hungary (779 thousand tons, 5.4%), and Spain (621 thousand tons, 4.3 %) [8, 15].

Apple yield registered an important growth of 20 % in the analyzed period. In 2014, apple yield accounted for 9,306 kg/ha compared to 7,755 kg/ha in 2007. In the year 2012, the severe drought affected apple yield, which decreased to 8,355 kg/ha, being by 22.14% lower compared to the amount of 10,730 kg/ha, the maximum yield achieved in 2011. Of course, apple yield had a strong influence on apple production, which in the year 2012 accounted for 462.9 tons.

Photo 3. Apple production.

The evolution of apple yield reflects a continuous increasing trend from 2007 to 2010 and then, after the decline in 2012, a recover, so that in 2014, apple yield became 9,306 kg/ha, being by 7.3 5 higher than in 2012.(Fig.6.).

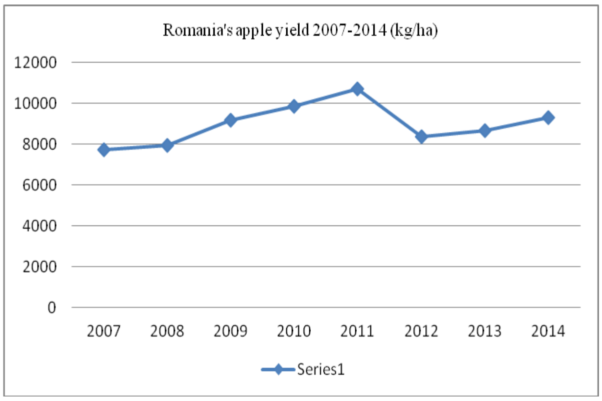

Fig. 6. The evolution of Romania's apple yield in the period 2007-2014 (kg/ha)
Source: Own design based on NIS Tempo-online database 2015

According to Eurostat, apple yield is smaller in Romania, only 9.8 tons/ha, coming on the 8th position in the EU-28, among other EU countries such as: Greece 176.1 tons/ha, France 51.5 tons/ha, Italy 46.9 tons/ha, Germany 35.2 tons/ha, Hungary 30.8 tons/ha, Spain 23.2 tons/ha, Poland 22.3 tons/ha [15].

The fruit consumption/inhabitant. In Romania, fruit consumption increased due to the more intense recommendations as population to consume more fruit and vegetables. In 2013, fruit consumption was 73.7 kg/capita by 5.4 % higher than in 2007, when it recorded 69.9 kg.

Apple consumption/inhabitant registered a slight decline, in 2013, being 23.6 kg/capita compared to 23.6 kg in 2007. The share of apples in fruit consumption decreased by 5.3 % from 33.8 % in 2007 to 31.9 % in 2013(Fig.7.).

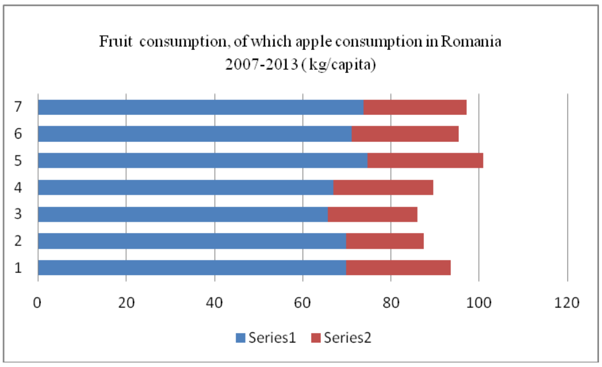

Fig. 7. Fruit consumption, of which apple consumption in Romania, 2007-2013 (kg/capita)

Source: Own design based on NIS Tempo-online database 2015

Regarding apple consumption/inhabitant, Romania comes on the 16th position in the world, with 23.5 kg/capita and on the 9th position in the EU, after Austria (53 kg), Slovenia (36 kg), Netherlands (34), Hungary (31 kg), United Kingdom (27 kg), Luxembourg (26 kg), Croatia (25 kg), and Portugal (24 kg).(Table 1).

Table 1. Apple consumption per inhabitant in the top 16 countries in the world in 2015 (kg/capita)

	Country	Apple consumption		Country	Apple consumption		Country	Apple consumption
1	Austria	53	7	Iceland	33	13	Luxembourg	26
2	Montenegro	43	8	Hungary	31	14	Croatia	25
3	Switzerland	38	9	Kazakhstan	31	15	Portugal	24
4	Slovenia	36	10	Turkey	29	16	Romania	23
5	Netherlands	34	11	Australia	28			
6	Norway	34	12	United Kingdom	27			

Source: http://www.statsmonkey.com/bar/20935-list-of-countries-by-apple-consumption-per-capita.php [37]

Fruit production/inhabitant increased by 8.7 % from 51.4 kg/capita in 2007 to 55.9 kg/capita in 2014. It was the result of the production growth and also of the decline in Romania's population. (Table 2)

Apple production/inhabitant registered an increase by 19.6 % from 22.4 kg/capita in 2007 to 26.8 kg/capita in 2014.

As a consequence, the share of apple production/inhabitant in the fruit production/capita increased by 10.1 % from 43.5 % in 2007 to 47.9 % in 2014. (Table 2).

Table 2. Fruit production/inhabitant and apple production/inhabitant, Romania, 2007-2014 (kg/capita)

	2007	2008	2009	2010	2011	2012	2013	2014	2014/2007 %
Fruit prod./Capita	51.4	57.1	64.7	69.9	73.2	56.6	64.9	55.9	108.7
Apple prod./Capita	22.4	22.2	25.3	27.2	29.7	23.0	24.6	26.8	119.6
Share (%)	43.5	38.9	39.1	38.9	40.6	40.6	37.9	47.9	110.1

Source: Own calculation based on National Institute of Statistics, Tempo On-line Database, 2014, [24]

The differences between fruit and apple consumption and fruit and apple production/capita are explained as follows: (i) when the difference between consumption and production is a positive one, this means that consumption is covered both by domestic production and also by imports: (ii) when the difference between consumption and production is a negative one this means overproduction and the surplus could be exported (Table 3).

Table 3. Differences between fruit and apple consumption and fruit and apple production per inhabitant (kg/capita)

	2007	2008	2009	2010	2011	2012	2013	2013/2007 %
Fruit differences	+18.5	+12.7	+1.0	-2.9	+1.5	+14.5	+8.8	47.5
Apple differences	+1.2	-4.5	-5.0	-4.7	-3.5	+1.3	-1.1	90.9

Source: Own calculations.

Fruit consumption is difficult to be established. However, usually researches involves questionnaire based surveys on consumer panels to indentify consumer preferences and eating habits regarding fruit and apples.

In 2013, such a study concluded that about 95 % of the Romanian consumers prefer to consume fresh fruit at least one time a week, 43.4 % respondents prefer to consume fruit every day, 40.9 % individuals prefer to consume 2-3 times a week and 11 % prefer to consume fruit one time a week.

In Romania, the most consumed fruit are apples (88.9%), followed by bananas (85.1%), oranges (73.5 %), lemons (63.6 %), kiwi (43.1 %), grapefruit (37.4 %).

Regarding the place where the fruit are purchased, the interviewees responded as follows: 94.9 % respondents used to buy fruit and 22 % used to receive fruit from their relatives and friends from the countryside. Of the consumers who used to purchase fruit, 81.3 % prefer to buy them from a supermarket, 64.8 % prefer to buy them directly from the market where producers sell their fresh products, and 40.1 % prefer to buy fruits from specialized fruit shops.

Self-sufficiency rate in fruit sector values below 100 %, reflecting that internal production is not able to meet consumers' demand. In case of apple, self-sufficiency has higher rates reflecting a better situation.(Table 4).

Table 4. Self-sufficiency rate (SSR) in fruit sector in Romania, 2007-2013 (%)

	2007	2008	2009	2010	2011	2012	2013	2013/2007 %
Fruit SSR	77	77	83	81	81	75	79	102.5
Apple SSR	103	108	105	103	100	84	95	92.2

Source: [2]

Average consumer's apple price. The average consumer's apple price increased by 23.3 % from Lei 2.23 per kilogram in the year 2007 to Lei 2.75 in the year 2014. The price level was influenced by demand/offer ratio in the market.

In the years 2012 and 2014, the average consumer's apple price in Romania was lower than in other EU countries such as: Germany, Italy, Spain and Czech Republic.

Also, it was equal to the average apple consumer's price in Bulgaria and higher compared to the average apple price in Poland (Table 5).

Table 5. Average consumer's price for apples in Romania compared to other EU countries, in 2012 and 2014 (Euro/kg)

Year	Romania	Bulgaria	Poland	Germany	Italy	Spain	Czech Rep.
2012	0.9	0.9	0.8	1.8	1.7	1.7	1.3
2014	0.8	0.8	0.6	2.0	1.9	1.8	1.2

Source: [2]

Average producer's apple price is higher in comparison with producer's price in other EU member states. In 2014, average producer's price for apples accounted for Euro 62/100 kg, being 4.7 times higher than in Poland, 2.5 times higher than in Hungary, 1.67 times higher than in Italy, 1.44 times higher than in Spain, 1.36 times higher than in Germany. The producer price is higher in Romania because of the high price for farm inputs, the old technologies, the low fruit quality and the lack of organization on the fruit chain (Table 6).

Table 6. Average producer's price for apples in Romania compared to other EU countries, in 2005, 2010 and 2014 (Euro/kg)

Country	2005	2010	2014	2014 %
Romania	48	51	62	100.0
Poland	12	18	13	476.9
Hungary	16	28	24	258.3
Italy	32	40	37	167.5
Spain	28	35	43	144.1
Germany	32	40	45	137.8

Source: [2]

Descriptive statistics for the main studied indicators is presented in Table 11.

The variation coefficients for orchards area, apple tree area, fruit production, apple production, fruit consumption and apple consumption are small, ranging between 4.63 % in case of fruit consumption and 17.66 % in case of orchards area.

This reflect that the data series for each indicators were homogenous and the average was a representative one.

However, in case of orchards area, the coefficient of variation of 17.66 % is closer to the threshold 20 % between a homogenous indicator and a relatively homogenous one.

Table 7. Descriptive statistics for the main indicators characterizing fruit and apple sector in Romania in the period 2007-2014

Descriptive Statistics	Orchards area (Thou ha)	Apple tree area (Thou ha)	Fruit production (Thou tons)	Apple production (Thou tons)	Fruit consumption (kg/capita)	Apple consumption (kg/capita)
Mean	175.47	51.17	1,255.15	512.13	70.27	22.58
Standard deviation	31.00	1.86	147.26	49.39	3.26	2.79
Median	177.10	56.65	1,239.6	505.45	69.9	23.5
Kurtosis	-2.64	3.79	-1.45	-0.22	-0.99	0.52
Skewness	-0.03	1.81	0.39	0.71	-0.01	-.079
Minimum	142.2	55.4	1,085.8	459	65.7	17.7
Maximum	207	61.3	1,479.9	600.9	74.7	26.2
Variation Coeffic. (%)	17.66	3.63	11.73	9.64	4.63	12.3

Source: Own calculation.

Fruit chain organization. In Romania, the degree of organization in fruit sector either in fruit producers groups or producers organizations is very small, about 1 %, compared to other EU countries like Netherlands and Italy where the fruit chain is very well organized. This is because of an inadequate percentage ratio between the value of commercialized production and the value of gross production in the fruit sector.

The main features of the fruit chain are the following ones: the large number of fruit producers, the small size of plantations, the old age of plantations, the lack of modern super-intensive technologies, the lack of modern endowment regarding: irrigation systems, logistics, climate-controlled warehouses, utilities etc, a reduced number of partnerships and commercial contracts with the beneficiaries and the reduced number of associative forms [2, 3].

CONCLUSIONS

In the analyzed period, the orchards area registered a decline because of the plantations aging, the application in the most of cases of the classic technologies lacked of productivity, a low economic efficiency. Just a small surface is represented by new modern orchards.

However, fruit production has grown due to the increased performance in fruit yield, conditioned by the large range of fruit trees varieties.

Apple plantations represent 39.5 % of the orchards area and contribute by 48 % to the fruit output. Romania comes on the 3rd position regarding the apple tree orchards and on the 8th position in the EU-28 for apple production.

Fruit consumption increased in Romania due to the orientation of the population to a healthier diet based much more on fruit and vegetables. With 23.5 kg/capita apple consumption, Romania is situated on the 9th position in the EU-28 and on the 16th position in the world.

However, the domestic production is not enough to cover consumers' needs, as reflected by the self-sufficiency rate and for this reason fruit imports were required. But apple self-sufficiency rate is satisfactory excepting the years when internal production is affected by climate conditions.

In Romania, both apple producer price (Euro 62/ton) and apple consumer price (Euro 80/ton) are very high compared to other EU countries in 2014.

The study identified that the main directions to develop fruit sector in Romania, a country with a high fruit production potential, are the following ones: the organization of small producers into associative forms allowing them to set up modern plantations, to get cheaper farm inputs, to assure a modern infrastructure, to apply intensive and super-intensive growing technologies, to conclude firm contracts with retailers and whole sellers, and sell better their fruit, increasing the economic efficiency across the whole fruit chain.

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SOME CONSIDERATIONS ON VEGETABLES AND TOMATOES PRODUCTION AND CONSUMPTION IN ROMANIA IN THE PERIOD 2007-2014

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Abstract

The purpose of the paper was to analyze vegetables and mainly tomatoes contribution to fruit production and consumption in Romania. Based on the statistical data for the period 2007-2014, it was studied the dynamics of the surface cultivated with vegetables and tomatoes, vegetable and tomatoes production, tomatoes yield, vegetable and tomatoes production per inhabitant, and also consumption and producer's price. Although vegetable and tomatoes cultivated area declined by 22 %, and respectively by 10 %, vegetable production reached 3,808 thousand tons and tomatoes production 711 thousand tons in 2014. For this reason, Romania comes on the 8th position among the top tomatoes producers in the EU-28. The vegetable intake of 186 kg and tomatoes consumption of 38 kg per capita and year, Romania exceeds WHO's recommendations assuring a healthy offer to its inhabitants. Tomatoes are a top vegetable contributing by 18.3 % to the cultivated area with vegetables and by 18.9 % to vegetable production. But, tomatoes yield of 15.1 tons per ha in 2014 is still small compared to other top producers. And tomatoes price at farm gate is Euro 73/100 kg much higher than in other countries. For this reason, to increase productivity and efficiency along the product chain, it is needed to extend tomatoes growing in green houses by investing in modern farms where modern technologies to be implemented. Producers must join their capital and efforts into an associative forms, to enlarge farm size for getting cheaper farm inputs, for applying modern technologies, for better selling their products. An EU financial support is required, but the EU criteria should be revised and much better tailored to the concrete conditions of Romania's small holdings, which are the most numerous in the Community.

Key words: *consumption, production, tomatoes, trends, vegetables, yield, Romania*

INTRODUCTION

Tomatoes, scientifically named *Lycopersicon lycopersicum* (L.) H. Karst, have their origin in Central America, from where they were brought in Europe in 1556 [6].

Tomatoes are grown in the whole world and they occupy the top position among fruit, being followed by bananas, apples, oranges and melons [10].

Tomatoes are a very important fruit and vegetable as well, because of their energetic value (150 calories/100 g) and high nutritive value, given by the chemical composition, including many nutrients such as: minerals (P, N, Ca, Mg, and traces of Fe, Cu, Zn, Mn), vitamins (C, E), lycopene (a natural antioxidant which destroy the free radicals and protect human body against cancer, heart and lung diseases), beta carotene an important pigment, fibers, water [13].

In a tomato of 102 g, it is 93.9 % water, 0.62 % ash, 1.82 % fiber, 0.9 % protein, 9.93 % glucose, 1.02 % fructose [22].

Also, in 100 g tomato there are 250 mg K, 17 mg C vitamin, 1 mg E vitamin, 700 µg beta carotene and 16 µg folats.

Tomatoes have not only a nutritive value but also an energetic one. In 100 g of tomatoes there are 150 calories [23].

Due to their chemical composition, tomatoes have a therapeutic importance being recommended to be consumed for assuring an alkaline environment in the human body, for preventing and treating cancer, heart, stomach and lung diseases, for assuring a normal physiological activity of the organism [17].

Tomatoes are consumed as fresh vegetables in salads as such or combined with other vegetables, and also like processed vegetables (sauces, pastas, ketchup, juices etc).

There are not specific amounts of tomatoes which must be consumed daily, but it is firmly recommended vegetables intake including a large variety of vegetables for assuring the requirements of human body in vitamins (A,C,E,K), minerals (K, Ca, P, Mg, Cl, Fe, Se etc), carbohydrates, proteins, fats and water.

FAO recommends about 350 g vegetables per day for the people older than 12 years and 100 g intake per day for younger people [9, 14].

In Romania, tomatoes find good soil and climate conditions to be cultivated in the field mainly in the South, South West and South-East parts of the country. But they are also cultivated in greenhouses for covering market demand in extra seasons [19].

Tomatoes growing in green houses and plastic tunnels is more and more extended for increasing productivity by applying modern technologies, which allow tomatoes cultivation in non specific production areas like Transilvania Region of Romania [21].

Also, because the domestic production is not enough to entirely cover consumption in the unfavorable years, important amounts of tomatoes are imported from Italy, Spain, Netherlands, Greece, Bulgaria etc.

In Europe, the vegetable supply is higher in the Southern countries and lower in the Northern regions. For instance, in Greece, the average supply per day is only 756 g (276 kg/person), while in Finland, the average supply is 3.9 times smaller, i.e. 195 g/person a day (71 kg).

Regarding the consumption of fresh vegetables, based on household data, it was found that the vegetable consumption varies between 109 g/day in Norway and 284 g/day in Cyprus. Concerning the processed vegetables, the highest consumption is in Italy 56 g/day and the lowest in Cyprus (4 g/day) [5].

In Europe, the average vegetable intake (pulses and nuts included) is 220 g/day [8].

In general, WHO recommends more than 400 g vegetables and fruit per day, but only Poland, Germany, Italy and Austria meet this recommendation.

In this context, the paper aimed to analyze the main trends in vegetable and mainly tomatoes production and consumption in Romania based on the statistical data, and to identify the major problems and suggest solutions to develop tomatoes production in the future.

MATERIALS AND METHODS

The documentation was based on various information sources: scientific articles, books, press articles etc.

In order to set up this study, the empirical data were collected from the National Institute of Statistics Tempo-on line database, from Ministry of Agriculture and Rural Development Reports on Agriculture and from Eurostat Statistics Explained Database.

The analysis was focused on the following indicators: the area cultivated with vegetable, and with tomatoes, vegetable and tomatoes production, tomatoes yield, tomatoes price, vegetable and tomatoes consumption, the major problems the vegetable sector is facing.

These indicators were analyzed in dynamics for the reference period 2007-2014.

The empirical data were processed by usual methods such as index method and comparison method.

The tables and graphs included in the article text show the main results in an illustrative manner.

RESULTS AND DISCUSSIONS

Vegetables and tomatoes cultivated area. Romania has important surfaces cultivated with vegetables. However, in the analyzed period, the cultivated area with vegetables declined by 5.5 % from 253.4 thousand ha in 2007 to 239.5 thousand ha in 2014 (Fig. 1).

The same descending trend was followed by tomatoes cultivated area. Tomatoes were cultivated on 43.9 thousand ha in 2014, by 4.6 % smaller in comparison with the year 2007 when they were cultivated on 46 thousand ha (Fig. 2).

The share of the area cultivated with tomatoes in the cultivated land with vegetables registered a slight increase of 1.1 %, from 18.1 % in 2007 to 18.3 % in 2014.

The cultivated area with vegetables by Romania represented 7.3 % of the total cultivated area with vegetables in the EU-28 in the year 2015, which accounted for 2.075

million ha [7].

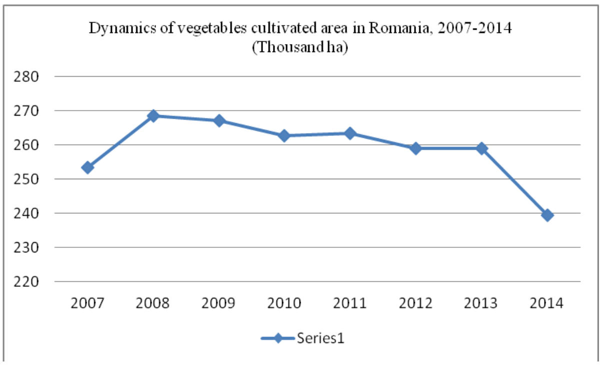

Fig. 1. Dynamics of the vegetables and tomatoes cultivated area in Romania, 2007-2014 (Thousand ha)
Source: Own design based on NIS Tempo-on line database

Photo 1.Vegetables and fruits.

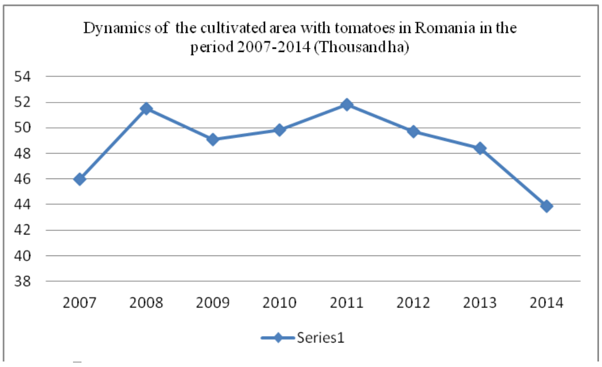

Fig. 2. Dynamics of the cultivated area with tomatoes in Romania in the period 2007-2014 (Thousand ha)
Source: Own design based on NIS Tempo-on line database

Vegetable and tomatoes production. Vegetable production increased by 22.1 % from 3,116.8 thousand tons in 2007 to 3,807 thousand tons in 2014 (Fig. 3).

Also, tomatoes production followed a similar increasing trend, raising by 10.9 % from 640.8 thousand tons in 2007 to 711 thousand tons in 2014, reflecting the need to cover much better the domestic market by internal output and to reduce imports (Fig. 4).

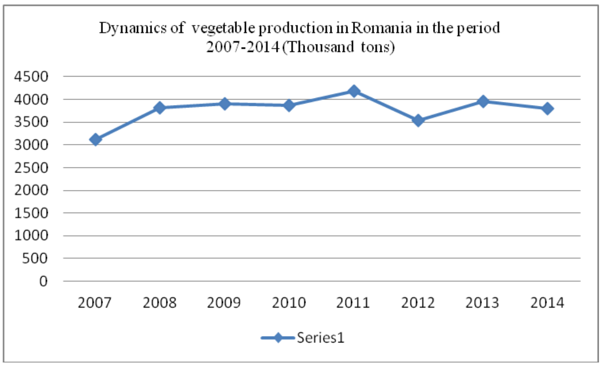

Fig. 3. Dynamics of vegetable production in Romania in the period 2007-2014 (Thousand tons)
Source: Own design based on NIS Tempo-on line database

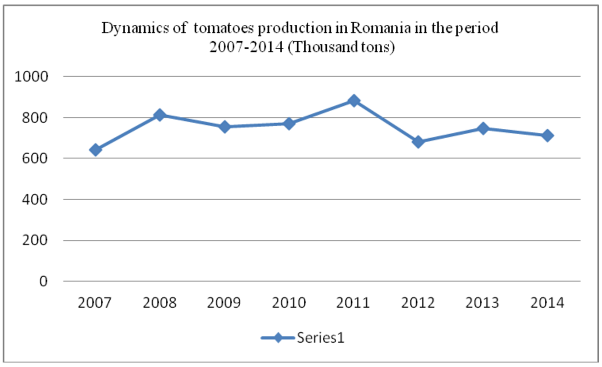

Fig. 4. Dynamics of tomatoes production in Romania in the period 2007-2014
Source: Own design based on NIS Tempo-on line database

Photo 2. Tomatoes production.

Vegetable and tomatoes production per inhabitant. As a result of the dynamics of vegetable and tomatoes production and of Romania's population, vegetable production per capita recorded an increasing trend in the analyzed period. In 2014, vegetable production per inhabitant this indicator reached 191 kg, being by 29.3 % higher than in 2007, when it accounted for 147 kg/capita. The only decline was registered in 2012, when production/inhabitant accounted for 176 kg due to the reduction of output caused by drought. In the next years, production/capita has been recovered. (Table 1).

Table 1. Vegetable and tomatoes production/inhabitant in Romania in the period 2007-2014 (kg/capita)

	2007	2008	2009	2010	2011	2012	2013	2014	2014/2007 %
Vegetable production/ inhabitant	147	185	191	190	207	176	198	191	129.9
Tomatoes production/ inhabitant	30.3	39.4	36.9	37.9	43.6	33.9	37.4	35.6	117.5

Source: Own calculations based on the data provided by [15].

Tomatoes production per inhabitant has also recorded an ascending trend, so that in 2014, it accounted for 35.6 kg/capita, being by 17.5 % higher than in 2007.

The only inflexion was noticed in 2012, when per inhabitant only 33.9 kg tomatoes were produced, by 22.25 % less than in 2011 (43.6 kg).

With a little bit more than 35 kg tomatoes/capita, Romania is situated over the EU-28 average of 35 kg/capita.

Tomatoes yield. Despite that the cultivated area declined by 4.6 %, tomatoes production increased by 10.9 % in the analyzed period and this was due to the yield growth by 16.5 %, from 13.9 tons/ha in 2007 to 16.2 tons/ha in 2014 (Fig.5.).

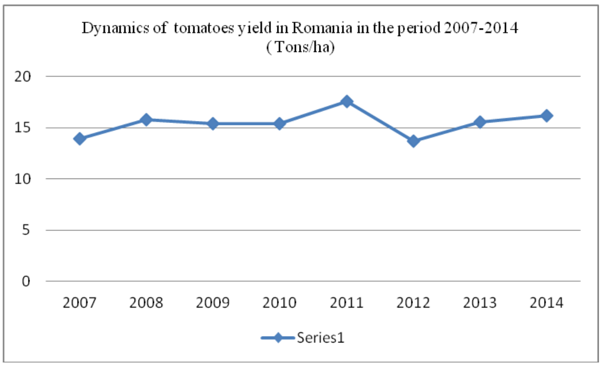

Fig. 5. Dynamics of tomatoes yield in Romania in the period 2007-2014 (Tons/ha)

Source: Own design based on NIS Tempo-on line database

Regarding tomatoes yield, Romania comes on the 8th position in the EU, after France, Portugal, Spain, Greece, Italy, Bulgaria and Poland, reflecting that it has a high potential to produce tomatoes (Table 2).

Table 2. Tomato yield in Romania and other EU countries

Country	2007	2008	2009	2010	2011	2012	2012/2007 %
France	174.3	174.3	161.1	137	140.8	146.8	84.2
Portugal	83.5	80.3	80.1	84.7	74.6	90.4	108.2
Spain	76.6	69.6	76.5	72.7	76.6	83.5	109.0
Greece	53.1	53.5	54.0	58.1	59.4	59.4	111.8
Italy	62.1	51.8	54.5	50.7	57.4	53.9	86.7
Bulgaria	27.8	38.3	34.7	32.7	23.0	27.6	99.3
Poland	24.1	24.5	23.9	15.5	23.3	22.3	92.5
Romania	15.6	17.7	17.0	14.5	20.1	15.2	97.4

Source: Own calculations based on the data provided by Eurostat, 2013

In Romania, the yield increased due to the farmers wish to produce more in green houses, using high productive hybrids and applying modern technologies with drip irrigation system. Tomatoes productivity is deeply influenced by cultivars, the Romanian ones being better adapted to the local conditions. Among the cultivars of high potential there are: Siriana F1, Pontica 102, Viorica, Darsirius, Buzau 47, Kristinica, Carisma, Carolina [18].

Also, other varieties were imported to be tested regarding their performance under Romania's conditions and to find the possibilities to increase production. In 2012, about 90 % of tomatoes cultivars used in Romania were hybrids achieved by the Romanian research stations and just 10 % were represented by imported varieties [19].

Tomatoes quality is an important production and marketing aspect with a deep impact on product rice and consumer behaviour. Tomatoes quality depends on cultivars and it is reflected by a large range of fruit features such as: fruit height, spherical shape, flesh aspect, firmness. The strong correlation, r = 0.784 between tomato fruit shape index and its firmness shows that the flesh is firm if the shape is spherical. This aspect is important for producers and traders, because tomatoes with a firm flesh are resistant to handling and losses are lower. But, from the consumers' point of view, tomatoes with a firm flesh are not so juicy. Fruit thickness is also important both for producers and traders, but also for consumers, assuring a longer period of preservation and a reduced percentage of losses. The tomatoes quality is also given by the chemical composition of the fruit, mainly by the content in dry matter, carbohydrates and titrated acids. The content in dry matter is strongly correlated with fruit weight (r = 0.843), and, of course, with tomatoes yield [4, 20].

Photo 3. High quality tomatoes.

Average vegetable and tomatoes producer's price. Both the average price of vegetables and of tomatoes recorded an increasing trend. However, sometimes, the average price for tomatoes was almost similar with the average price of vegetables and sometimes even it exceeds it, as shown by the statistical database of the National Institute of Statistics.

For instance, in 2011, both the averageprice at the farm gate for vegetables and for tomatoes accounted for Lei 1.41 per kg, while in 2007 it was different, Lei 1.22/kg vegetables and, respectively Lei 0.82/kg tomatoes.

In the period 2008-2010, the average tomatoes price exceeded the average vegetable price by 29.2 %, 0.9 % and, respectively 68.2 % [16].

Tomatoes price, and in general, vegetable price in Romania is higher than in other EU countries.

For instance, producer's price for tomatoes produced in the field increased by 7.3 % from Euro 68/100kg in 2007 to Euro 73/100 kg. In the period 2007-20145, Poland registered the highest tomatoes price growth (+ 166 %) from Euro 15/100 kg in 2007 to Euro 40/100 kg in 2014.

However, in Poland, tomatoes producer's price is by 45.21 % lower than in Romania. In Italy and Greece, in 2014, tomatoes price was by 60 % and, respectively 10 % higher than in Poland (Table 3).

Vegetable and tomatoes consumption per inhabitant. The average vegetable consumption has followed a sinuous trend from 169.2 kg/capita in 2007 to the maximum level 191.8 kg/capita recorded in the year 2011.

After the year 2011, in the year 2012, the mean vegetable consumption was 177.4 kg/inhabitant, explained by the lower internal production and the high price in the market caused by the high producer's price.

In the period 2010-2014, the mean tomatoes consumption declined from 40 kg/capita in 2010 to 38.1 kg (- 4.8 %) in 2014. This was caused by the higher and higher price of tomatoes in the market. (Table 4).

Table 3. Average price for tomatoes produced in the field in Romania and other EU countries in the period 2007-2014 (Euro/100 kg)

	2007	2008	2009	2010	2011	2012	2013	2014	2014/2007 %
Romania	68	65	49	80	50	68	54	73	107.3
Italy	60	60	62	60	65	72	68	64	106.7
Greece	60	64	53	63	48	47	44	44	73.3
Poland	15	20	15	26	22	30	37	40	266.6

Source: Own calculation based on the data from [2, 7].

Table 4. Average vegetable and tomatoes consumption in Romania in the period 2010-2014 (kg/capita)

	2010	2011	2012	2013	2014	2014/2010 %
Vegetable consumption	184.6	198.8	177.4	180.7	186	100.7
Tomatoes consumption	40	38.6	38.4	35.4	38.1	95.2

Source: NIS, Romania's Statistical Yearbook, 2015 [16].

The descriptive statistics regarding mean, standard deviation, median, kurtosis, skewness, minimum and maximum value and the coefficient of variation for cultivated vegetable area, cultivated tomatoes surface, vegetable production, tomatoes production and tomatoes yield is presented in Table 5.

The variation coefficient recorded small values in case of all the indicators mentioned in the table. The small values ranged between 3.57 % in case of the vegetable area and 10.02 % in case of tomatoes production.

These results reflect that each the series of values for each indicator are homogenous and that the calculated average is a representative one.

Table 5. Descriptive statistics for the main studied indicators characterizing vegetable and tomatoes sector in Romania in the period 2007-2014

Descriptive Statistics	**Vegetable area (Thou ha)**	**Tomatoes area (Thou ha)**	**Vegetable production (Thou tons)**	**Tomatoes production (Thou Tons)**	**Tomatoes yield (Tons/ha)**
Mean	259.07	48.77	3,772.7	750.41	15.45
Standard deviation	9.27	2.57	319.21	75.22	1.24
Median	260.85	49.4	3,841.75	752.3	15.50
Kurtosis	2.54	0.19	2.24	-0.18	0.40
Skewness	-1.47	-0.86	-1.28	0.36	0.13
Minimum	239.5	43.9	3,116.8	640.8	13.7
Maximum	268.6	51.8	4,176.3	881.0	17.6
Variation Coeff. (%)	3.57	5.26	8.46	10.02	8.02

Source: Own calculation.

The major problems of the tomatoes sector. Tomatoes are produces mainly in small subsistence and semi-subsistence farms, where in most of cases technical endowment is low, technologies applied are traditional ones, production is risky due to the climate change and the appearance of the extreme meteorological phenomena (storms, floods, severe drought etc), causing substantial damages, production costs are high, tomatoes selling is difficult, because only a few number of the producers are members of associative forms. But tomatoes are also produced in green houses and tunnels, where modern technologies are applied and the use of certified seeds is the guarantee of a high production performance. Also, in vegetable production there are not climate controlled ware houses for vegetables preservation. For this reason, after harvest, most of the small producers used to sell their production to intermediaries at a low price a little bit over the production cost. The tomatoes chain is therefore fragmented, and we can discuss about direct sale in the market, but about a medium chain including producer - intermediary (whole seller) - retailers, which led to a high consumer price [1].

Also, another major problem is related to the restrained access of the Romanian vegetable producers to the EU payments according to CAP Pillar One. More than this, because the small size of the farms, more than 50 % of the Romanian producers remained outside the eligible criteria mentioned by Pillar Two [12].

CONCLUSIONS

While the cultivated area with vegetable and tomatoes had a decreasing trend from 2007 to 2014, in the last year of the analysis, accounting for 239.5 thousand ha and, respectively for 43.9 thousand ha, vegetable and tomatoes production increased by 22 % and, respectively by 10 %, reaching 3,808 thousand tons, and respectively 711 thousand tons in 2014. This had a positive impact on production per inhabitant which accounted for 191 kg vegetables and 35.6 kg tomatoes in the year 2014.

With a consumption of 186 kg vegetables and 38 kg tomatoes/capita, Romania exceeds World Health Organization's recommendations and shows that Romanians could benefit of a healthy diet.

Tomatoes are the main vegetable in Romania contributing by 18.3 % to the cultivated area with vegetables and by 18.9 % to vegetable production.

Romania is among the main producers in the EU-28, coming on the 8th position. With 15.1 tons/ha tomatoes yield, Romania produces much less than France, Portugal, Spain, Greece, Italy, Bulgaria and Poland. More than this producer's price is Euro 0.73/kg much higher than in other countries.

For improving tomatoes efficiency along the product chain, it is required to extend tomatoes growing in green houses by investing in modern farms where modern technologies to be implemented.

Producers must join their capital and efforts into an associative forms, to enlarge farm size in order to get cheaper farm inputs, to apply modern technologies, to assure a better marketing of their products, to grow productivity and competitiveness.

An EU financial support is required, but the EU criteria should be revised and much better tailored to the concrete conditions of Romania's small holdings, which are the most numerous in the Community.

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ANALYSIS OF THE BARRIERS LEADING TO FAILURE OF LAND CONSOLIDATION OF THE FIELDS

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Abstract

The biggest problem in transition from traditional agriculture to modern and up-to-date agriculture is the lack of land consolidation of the fields. The present study aimed to analyze the barriers to effective land consolidation of fields in the city of Urmia. This study is a descriptive survey research. It is practical and data was gathered by field study. Data was gathered by a questionnaire which its content validity was approved by supervisors and consultants and its reliability was approved with Cronbach's alpha with the value of 0.837. The statistical population was all the landowner farmers of Dehestans (A type of administrative divisions of Iran. It's above the village and under the Bakhsh) of Urmia, Iran, of which 330 were randomly selected with Morgan's Table and cluster sampling. The Pearson correlation coefficient results showed that there is a 1 % statistical significance between the variables of economic barriers, social barriers, political and governmental barriers, domestic and natural barriers, and field structure and failures in land consolidation and multiple regression analysis indicated that the economic, social, political, governmental, domestic, and natural barriers and field structure have a %69 effect on failures in land consolidation. Significant positive effect of different barriers on land consolidation is as follows: Economic barriers, 47.4 %; social barriers, 23.2 %; political and governmental barriers, 21.1 %; domestic barriers, 10.5 %; and natural barriers and land structure 9.5 %.

Key words: *domestic barriers, economic barriers, lack of land consolidation, political and governmental barriers, social barriers, natural barriers and land structure, Urmia, Iran*

INTRODUCTION

Exploitation systems have always had important role in agriculture development and was always one of the fundamental issues regarding water and soil source usage in the agriculture of Iran. Its importance is due to the fact that exploitation system management type can affect or cause limitations in the production amount, attribution and usage of agriculture technologies and equipment of fundamental issues, usage of machinery, and optimum usage of sources with proper yield and planners have always searched for ways to minimize the management deficiencies and problems in these systems [13].

Primary agriculture exploitation systems (yeoman, farmer, rent, ownership) that have no production systems enter cooperative production systems (joint stock, traditional cooperation, production cooperation, joints) and finally private systems (Land capitalism, Agro-Industrials) [11]. Although the system parts in exploitation include production sources (water and soil, land and technology), system activist (villagers, farmers, managers, source owners), and system environment (natural, social, economic, cultural, political environment), we should not forget a key, subtle, and forgotten element related to this system and that is wrong planning, wrong decision making by internal decision makers or opposite decisions dictated by foreign countries [19].

Small production units and scatter of the parts cause problems for fundamental equipment, watering yield increase, agriculture machinery usage, and mechanization which are barriers to the usage of advanced production methods [12].

All these elements and lack of proper exploitation system, have negative effects on financial efficiency, sources, and production factors in agriculture; so much that in many cases, not only does not lead to increase of production efficiency and optimum usage of production elements and sources, also in many cases lead to environmental waste and destruction of water and soil sources [3].

Development of agriculture in our society is not only a basic need but is also inevitable and it is unavoidable to change traditional structures, improve production amount, reduce poverty, and create new capacities. However, this is only possible with change of attitudes and improper beliefs on development in general and specifically development in agriculture [1].

Environmental and national elements of exploitation systems, in turn, are affected by global environment and we know- through experience- that global changes affect national environments directly and indirectly and agriculture exploitation systems indirectly and can have positive and/ or negative effects [4].

The exploitation systems' challenges are almost the same as agriculture challenges. We can divide them into two main groups: a) challenges out of agriculture field and b) challenges inside agriculture [17].

There are many challenges against land consolidation and some of them are: the lands being small and outspread, the number of parts in each ownership, lack of sufficient infrastructure in agriculture field, inability of micro and farmer systems in saving and investment and usage of new technologies, agriculture credits, lack of water and improper use of it in agriculture, and lack of production in surface unit [14].

Zarifian et al.[21] studied family exploitation systems and urban production cooperation's stability in Agh Ghala, Golestan, Iran. The results indicated that 14.7 % of the exploitations studied (cooperative and family) were very unstable; 42.1 %, unstable; 22.1 %, averagely stable; 20.3 %, stable; and only 0.9 % very stable. Comparison of stability mean of two exploitation systems studied showed that stability of cooperative exploiting system in economic, social, environmental dimensions is in better condition compared to family exploitation. The results also indicated that the six variables of investment, age of the exploiter, amount of cooperation, field size, access to institutions, and machinery have direct effects and the variables of agriculture information resources exploitation and literacy level of the exploiter have indirect effects on stability level of exploitation systems.

Fe'li et al.[6], studied farmer exploitation (yeoman) in a research and argued that the best substitute is the village cooperative production exploitation system.

Fe'li et al. [6] studied the challenges and problems of farmer exploitation (yeoman) in a research and argued that their challenges are lack of proper infrastructures, smallness of fields and non-consolidation of lands, presence of non-experts in agriculture, low mechanization coefficient, and use of traditional methods. So they suggested the village cooperative production exploitation system instead of yeoman systems for more productivity of villagers.

Rousta & Teimoori [15], studied the priorities in deterrent factors to land consolidation in Darmian, Khorasan Razavi Province, Iran and concluded that the social factor is the main deterrent factor for land consolidation plans and on the next level were the cultural, economic and structural factors. They suggested education and promotion, building trust, and giving credit and financial facilities to implement land consolidation.

Hejrati & Afshari [10], studied the role of land ownership in village development in a case study of Paein Rokh Dehestan in Torbat-e-Heydarieh, Iran. The results showed that although the vastness of fields leads to increase in productivity per surface, the minor villagers did not have any interest in organizing and thought it would lead to joblessness and preferred the traditional cultivation method to the modern one.

Zarifian et al. [21], studied the effective elements on land consolidation in Kabootarahang villages in Hamedan, Iran and concluded that consulting the experts, agriculture background, membership in organizations, number of fields, amount of income, and field size were effective factors in accepting land consolidation by farmers.

Haghighat et al. [9], studied the obstacles in accepting the land consolidation in Fars

Province farmers' idea. According to the results the effective obstacles are agricultural, executive, socio-cultural, and financial. These factors determine 66.128 % of the general variance.

Sabates & Wheeler [16], suggested in a study that land consolidation in family fields close to each other happens spontaneously and informally with low costs and the outside efforts for legal and formal consolidation of scattered fields is not accepted.

Vitikainen's [20], studies in Europe indicated that the most justified reason for profitability of land consolidation is the size of the field and reduction of the number of the fields. The difference in accessibility of some fields to roads and water sources makes many problems for land change and consolidation.

Bahadur & Siegfried's [5], studies in Nepal indicated that access to credits, educational level, non-agricultural income, promotion services, projects implanted in this field, field size, and farmer's experience had significant effect on decision to accept the consolidation.

Variables like farm size, number of promotion contacts, and amount of technology yield are effective factors on the farmers' decision to accept the consolidation in Saka et al.'s [18] study in South-west of Nigeria.

The results of Gergievsk's [7] study by the title of "Land Consolidation as One of the Modes for the Enlargement of Agricultural Land in Macedonia" show that dispersion of lands was one of the main barriers to agriculture development in Macedonia and establishing village cooperation and technical support from the government are important elements on implementation of land consolidation.

Gonzalez Garcia [8], research in Spain indicated that consolidation programs were important steps towards improvement of workforce efficiency and optimum productivity of fields and awareness increase in farmers on the financial and social results of land consolidation, transfer of useful information to farmers by propagators and governmental supportive programs are important factors in accepting this program.

The study of Akkaya Aslan et al. [2], in Turkey also showed that farmers' tendency to use pressurized irrigation and mechanization in their fields affect acceptance of land consolidation.

Agriculture in West Azerbaijan, Iran, provides important part of income and general welfare of more than 300 thousand people directly and another 300 thousand, indirectly. These people earn their living in 148 factories and firms of alterant and supplementary industries with the capacity of 984,500 tons and 190 industrial fridges with the capacity of 457,000 tons by harvesting, sorting, packing, marketing, and selling of the products.

At the moment, the biggest challenge for us is the high rate of yeoman and management of the fields by large number of farmers who are the managers and owners of them, too. This causes reduction of products and improper use of facilities and therefore, reduction of income. Hence, this paper surveys the barriers causing the failure of land consolidation in Urmia, Iran so that we can determine these elements and work on removing them to see what are the most important reasons for failure in land consolidation programs.

MATERIALS AND METHODS

This study is a descriptive research and has practical goals and uses field study to collect data. The statistical population was all the farmers and farm owners of Urmia, Iran. According to the statistics of Agriculture Jihad Organization, the number of yeomen in this city is 16,000. Sample size was determined as 330 ones by Krejcie and Morgan Table and they were chosen randomly by cluster sampling in each village. In this study we used a questionnaire to collect data which its content validity was approved by supervisors and its reliability was approved with Cronbach's alpha (0.837). The results were analyzed by SPSS software.

RESULTS AND DISCUSSIONS

The results showed that mean age of owners was 47 with the minimum 17 and the maximum 76. Most of the participants were in the 41-50 range of age. 42 respondents were women and 286 of them were men. 80 of them had attended school up to high school level and 70 of them had the diploma. Cultivation history mean was 27 years with the minimum of 2 and maximum of 55 years. Highest cultivation history was in 0-20 years' range. 256 respondents had their own house and 68 were tenants. 160 of them were self-employed and 120 of them had farming as their job. 280 of them used the help of their family and 45 of them used seasonal workers as human force. 270 of them used their own machinery and 60 of them used the rented ones to supply the machinery needed.

Pearson correlation coefficient was used to investigate the relationship between the variables of the study. The results showed that there is a 1 % of statistical significance between the variables of economic barriers, social barriers, political and governmental barriers, family and natural barriers, and field structure and failures in land consolidation. The results are shown in Table 1.

Table 1. Correlation Coefficient between variables of the research according to the responders

Variables	Correlation Coefficient with Failure in Consolidation Rs	P significance
Economic Barriers	0.745**	0.000
Social Barriers	0.693**	0.000
Political and Governmental Barriers	0.715**	0.000
Family Barriers	0.202**	0.000
Natural Barriers and Land Structure	0.453**	0.000

**P≤0.01

The results of multiple regression indicate that multiple correlation coefficient rate is R=0.831 and determination coefficient rate was R2=0.690.

Table 2. Linear Regression of Survey on Effective Factors on Failure in Land Consolidation

Correlation Coefficient (R)	Determination Coefficient (R2)	Adjusted Determination Coefficient (R2)	F	P
0.831	0.690	0.685	129.506**	0.000

**P≤0.01

The amount of determination coefficient shows that economic, social, political, governmental, family, and natural barriers and field structure have a 69 % effect on failures in land consolidation and the F calculated in statistical level of %1 shows that these effects were positive and significant. The results are shown in Table 2.

According to the values of β in Table 3, the formula is written as:

$$Y = 21.735 + 0.474\ X1 + 0.232\ X2 + 0.211\ X3 + 0.105\ X4 + 0.095\ X5$$

The results showed that the positive significant effect of various barriers on land consolidation failure is as follows: Economic barriers, 47.4 %; social barriers, 23.2. %; political and governmental barriers, 21.1. %; domestic barriers, 10.5 %; and natural barriers and land structure 9.5 %. The results are in consonance with those of the results of Pearson correlation coefficient.

Table 3. Effect Size of Effective factors on Land Consolidation

Variables	B	Standard Deviation	β	t	P
Constant	21.735	1.143	-	14.643	0.000
Economic Barriers (X1)	0.348	0.031	0.474	4.199	0.000
Social Barriers (X2)	0.169	0.042	0.232	4.025	0.000
Political and Governmental Barriers (X3)	0.122	0.033	0.211	3.655	0.000
Family Barriers (X4)	0.085	0.030	0.105	2.467	0.014
Natural Barriers and Land Structure (X5)	0.077	0.035	0.095	2.171	0.021

CONCLUSIONS

According to the researcher, the economic barriers are of the most important factors in land consolidation and as long as the economic conditions of the farmers are adjusted and facilities updated and financial sources provided, they cannot succeed in land consolidation and they will not cooperate with each other on this field.

The results of this study are in complete consonance with those of the study by Haghighat et al. [9], that studied the obstacles in accepting the land consolidation in Fars Province farmers' idea. And according to the results of factor analysis, concluded that the effective obstacles are four elements of agricultural, executive, socio-cultural, and financial. These factors determine 66.128 % of the general variance in general.

The results of this study are in complete consonance with those of the study by Bahadur & Siegfried [5], in Nepal indicating that access to credits, educational level, non-agricultural income, promotion services, projects implanted in this field, field size, and farmer's experience had significant effect on decision to accept the consolidation.

According to the researcher, the social barriers are of the most important factors in land consolidation. Lack of trust to each other, lack of interest in cooperation, and different sizes of fields are some of important social factors. Farmers should show interest in cooperation and work together to solve this problem and move towards land consolidation.

The results of this study are in complete consonance with those of the study by Haghighat et al. [9] that studied the obstacles in accepting the land consolidation in Fars Province farmers' idea. And according to the results of factor analysis, concluded that the effective obstacles are four elements of agricultural, executive, socio-cultural, and financial. These factors determine 66.128 % of the general variance.

The results of this study are in complete consonance with those of the study by Vitikainen [20], in Europe that indicated the most justified reason for profitability of land consolidation is the size of the field and reduction of the number of the fields. The difference in accessibility of some fields to roads and water sources makes many problems for land change and consolidation.

The results of this study are in complete consonance with those of the study by Saka et al.[18], which indicated that variables like farm size, number of promotion contacts, and amount of technology yield are effective factors on the farmers' decision to accept the consolidation in South-west of Nigeria.

According to the researcher, political and governmental factors are the beginning point for land consolidation. If the government does not take proper and calculated decisions and execute necessary rules, the program will fail and this will disappoint the farmers and become the biggest barrier in the cooperation of the farmers.

The results of this study are in consonance with those of the study by [17], which showed that mental factors; communication and information; personal inabilities; position of paddy fields; environmental factors; local institutes; and credit, promotional and governmental support of paddy field farmers in Mazandaran province, Iran, were effective in accepting the and consolidation.

The results of this study are in consonance with those of the study by Gergievsk [7], about land consolidation as one of the modes for the enlargement of agricultural lands in Macedonia. This study shows that dispersion of lands was one of the main barriers to agriculture development in Macedonia and establishing village cooperation and technical support from the government are important elements on implementation of land consolidation.

The results of this study are in consonance with those of the study by Gonzalez Garcia [8], in Spain which indicated that consolidation programs were important steps towards improvement of workforce efficiency and optimum productivity of fields and awareness increase in farmers on the financial and social results of land consolidation, transfer of useful information to farmers by propagators and governmental supportive programs are important factors in accepting this program.

According to the researcher, family is the main pillar of consultation between people and their ideas in motivating or preventing from cooperation with other farmers to consolidate lands are very important. Finding proper ways to help consolidate lands should start from home with the help of promotion and training programs of agriculture Jihad Organization.

The results of this study are in consonance with those of the study by [9], which showed that mental factors; communication and information; personal inabilities; position of paddy fields; environmental factors; local institutes; and credit, promotional and governmental support of paddy field farmers in Mazandaran province, Iran, were effective in accepting the and consolidation.

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According to the researcher, natural barriers and land structures are important factors in land consolidation. The position of fields in relation to each other and also facilities like roads and other elements is very important and leads to motivation or prevention of farmers in land consolidation.

The results of this study are in consonance with those of the study by Fe’li et al. [6], that studied the challenges and problems of farmer exploitation (yeoman) in a research and argued that their challenges are lack of proper infrastructures, smallness of fields and non-consolidation of lands, presence of non-experts in agriculture, low mechanization coefficient, and use of traditional methods.

The results of this study are in consonance with those of the study by Zarifian et al[21], that studied the effective elements on land consolidation in Kabootarahang villages in Hamedan, Iran. They concluded that consulting the experts, agriculture background, membership in organizations, number of fields, amount of income, and field size were effective factors in accepting land consolidation by farmers.

The results of this study are in consonance with those of the study by Gergievsk [7], about land consolidation as one of the modes for the enlargement of agricultural lands in Macedonia. This study shows that dispersion of lands was one of the main barriers to agriculture development in Macedonia and establishing village cooperation and technical support from the government are important elements on implementation of land consolidation.

The results of this study are in consonance with those of the study by Akkaya Aslan et al. [2], in Turkey that showed farmers’ tendency to use pressurized irrigation and mechanization in their fields affect acceptance of land consolidation.

The general results indicated that the factors and barriers studied (economic barriers, social barriers, political and governmental barriers, domestic barriers, and natural barriers and land structure) are of the most important reasons and factors in prevention of success in land consolidation. The starting point of change in any country is the government that should provide the situation that leads to trust by farmers so that they would willingly move towards consolidation and cooperate and share knowledge with other farmers. On the other hand, family has a great role, too. It should provide the proper conditions in all aspects- from financial to educational- in order to increase the role of the family. Making villas and changing farms into recreational sites should be avoided and fragmentation of lands in inheritance issues should be prevented and save them for yield increase by land consolidation for a better future for the country. Because human feeding is related to agriculture and its products and agriculture has a strategic and key role in today’s world.

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POLICY OF WASTE MANAGEMENT OF HAZARDOUS TOXIC (WASTE B3)

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Abstract

Mining activities have the potential to affect the health of the ecosystem and reduces its ability to provide goods and services needed for human welfare and the environment. The importance of a healthy environment for future generations is a pillar of sustainable development. To be more environmentally friendly, more mining operations carried out in a manner that minimizes its impact on the surrounding environment. A number of management strategies and technologies are being developed and used by the mining industry to reduce the environmental impact of mining. One of the potential considerable environmental pollutions may occur in the mining sector is pollution due to hazardous wastes and toxic (it's called B3 waste). Compliance with the Indonesian Government Regulation number 101 of 2014 has been a challenge for the coal mining company given the B3 waste management requirements are very detailed and rigorous. B3 waste management challenges become more complex than other business sectors because of the typical mining company-wide working area and the number of workers involved lots. The mining company must prepare a special strategy in the management of B3 waste to be able to adhere to all requirements. The study was conducted at Mining Company "X" in terms of the effectiveness of the management of B3 waste by using Regulation of the Governor of East Kalimantan, Indonesia number 05 of 2014 concerning Performance Rating Program Activity In Coal Mining Environmental Protection and Management. The purpose of this study are: (1) To determine and analyze the effectiveness of the Waste Management Policy B3 on Mining Company "X" is based on Government Regulation No. 101 of 2014; (2) To determine and analyze the added value of B3 Waste Management Policy in Mining Company "X" (it's called MC "X").

Key words: *environment, waste management*

INTRODUCTION

Sustainable development is one of the major tasks facing society today. Sustainable development is most commonly defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs [10]. The principles of sustainable development involve the integration of economic activities with environmental integrity, social issues, and effective governance systems [8]. These principles have a growing influence on the development of environmental and social policies in recent decades and has been adopted and promoted by a number of international organizations, including the UN and the World Bank [22]. Environmental protection is a very important part in achieving this goal. Environmental problems could endanger the lives of future generations. All efforts were made to minimize environmental impacts such as waste reduction and recycling, and waste must be disposed of in an environmentally friendly way [1].

Mining activities have the potential to affect the health of the ecosystem and reduce its ability to provide goods and services needed for human welfare and the environment [9]. These services include air purification, water, and decomposition of waste materials. The importance of a healthy environment for future generations is recognized as the "pillars" of sustainable development. To be more environmentally friendly, more mining operations carried out in a manner that minimizes its impact on the surrounding environment. A number of management strategies and technologies are being developed and used by the mining industry to reduce the environmental impact of mining.

Supervision of the potential environmental impacts that would arise, the Government requires all mining operations can begin only when the mining operations have had an environmental permit, it's called AMDAL AMDAL or environmental permit refers to the Law of the Republic of Indonesia [2] and Government Regulation of the Republic of Indonesia [3]. This shows that the commitment of environmental management becomes crucial for mining companies both in terms of regulatory compliance, maintain the quality of the environment and to ensure continuity of mine production.

One of the potential considerable environmental pollutions may occur in the mining sector is pollution due to hazardous wastes and toxic (it's called Waste B3). Hazardous and toxic waste (B3) has a different nature and characteristics of the waste in general, mainly because of the nature of unstable, stability B3 material is influenced by several external factors such as temperature, pressure or friction, mixed with other ingredients. This may trigger B3 material properties such as the nature of reactive, explosive, flammable or toxic nature. Given these risks, it is necessary that every industry activities can generate B3 waste to a minimum and prevent the entry of B3 waste into the work environment [2].

In accordance Government Regulation [5] B3 waste is defined as the residue of a business and / or activities that contain hazardous and toxic materials. According to the regulation of the activities of the B3 waste management which includes storage, transport, collection, processing, use and stockpiling must have permission from the government.

Compliance with the Government Regulation [10] has been a challenge for the coal mining company given the B3 waste management requirements are very detailed and rigorous. B3 waste management challenges become more complex than other business sectors because the typical mining company has wide working area and the number of workers involved lots. The mining company must prepare a special strategy in the management of B3 waste to be able to adhere to all requirements. Coal company's called "X" is a coal mining company located in the East Kutai Regency of East Kalimantan Province. B3 waste generated largely in mining activities is derived from mining heavy equipment maintenance activities and some of the activities of laboratories, power plants, clinics, and some minor activities supporting mining activities. Coal mining activities are supported by 46 workshop units generating B3 waste. This indicates that the B3 waste through from 46 unit workshops work. Mining Company "X" managing waste through minimal outlay has 46 gates of B3 waste and could have been more than 46 gates expenditure B3 waste because there are some units that have more than one work location.

The number of a gate of expenditure of B3 has the effect on adherence to regulatory compliance and the cost of waste management B3. In normal conditions the unit cost should increase every year, it is possible because of the increased cost of wages, transportation costs, and wastes management costs. If the predicted waste management costs increased by 10% each year, then it should be the increased unit cost of 0.59 USD / kg in 2009 to 0.95 USD / kg in 2014.

Challenges faced in managing B3 waste of coal mine are:

1) Compliance aspects, namely: (1) Target 100% adherence to regulatory provisions, especially the Government Regulation [5]; (2) to manage all waste B3 generated in the region works included by the Contractor.

2) Complexity, namely: (1) a large amount of B3 waste with different types and characteristics; (2) The amount of waste generated at the point of a considerable distance (46 units); (3) Some differences in waste management systems at several large contractors; (4) The number of people involved, especially as B3 waste; (5) the detailed reporting to the government should be sent every 3 months.

Challenges above makes Mining Company "X" set the one-gate of policy to B3 waste management or one gate policy "Every single hazardous waste generated, either by Mining Company "X" or Contractor must be disposed through Mining Company "X" Licensed Temporary Hazardous Waste Storage. This policy is expected to facilitate the Mining Company "X" to control B3 waste produced and adhere to Government Regulation [5].

Implementation of a one-gate policy of B3 waste management is expected Mining Company "X" (it's called MC "X") and all contractors working in the concession MC "X" can comply with all requirements of applicable legislation. However, a one-gate policy of B3 waste management at MC "X", whether it has been effective in terms of compliance to rules . Some contractors had proposed to manage B3 waste independently on each unit without following a one-gate policy. The One-gate policy of B3 waste management questioned by employees of MC "X" because it is considered inconvenient. Proposed independent B3 waste management is not implemented because some stakeholders in MC "X" judged that the one gate can still be implemented. The author considers that there is an unstable condition where at any time one-gate policy of B3 waste management at MC "X" may be changed without consideration and in-depth assessment. The One-gate policy of B3 waste management questioned by employees of MC "X" because it is considered inconvenient. Proposed independent B3 waste management is not implemented because some stakeholders in MC "X" judged that the one gate can still be implemented. The policy change could be made if the personnel involved did not understand the main purpose of the implementation of the policy of a gate and the impacts that may arise if the one-gate policy of B3 waste management cancelled.

Based on the description of the background, the problem is formulated as follows:

1) Is the policy of "One Gate Policy" Toxic Waste Management of Hazardous Materials (it's called B3 waste) is effective based on Government Regulation [5] ?

2) Is the policy of "One Gate Policy" B3 Waste Management at MC "X" has given added value?

The research objective is set as follows:

1) To know and analyze the effectiveness of the policy of "One Gate Policy" B3 Waste Management at MC "X" is based on Government Regulation [5].

2) To determine and analyze the added value of the policy of "One Gate Policy" B3 Waste Management at MC "X".

MATERIALS AND METHODS

Research Coverage

One-door policy effectiveness studies MC “X” in terms of waste management B3 author will using criteria as for the B3 waste management Any other criteria such aspects of water quality, air quality, and reclamation are not included in the measurement criteria [8]. Data B3 waste management costs using cost data B3 waste management in MC “X” Sangatta, East Kutai, Indonesia.

The research data used such as: (1) B3 waste management workflow process at MC “X”; (2) Type and volume of waste generated; (3) Facilities and systems supporting one-door policy B3 waste management; (4) The evaluation criteria for success in achieving policy objectives using criteria corresponding Governor Regulation [8]; (5) Data administration and compliance data related technical B3 waste management according to the criteria specified. Sample compliance will be taken at a point that will be set by the author consider the waste type and amount; (6) Other data that support the author to finish this article.

Test equipment effectiveness

The analytical tool used this study is to assess the percentage of achievement of the performance of B3 waste using a proper assessment standard [8] and [29]. Weights, assessment B3 waste management is 15 % of the total value, details of which can be seen in Table 1.

From table weight rating then developed a checklist [29], the checklist can be seen in Table 2.

Appropriate checklist criteria table 3 each question will be divided 4 (four) levels of the following values [11]: (1) A value of 0 for the criteria/questions are not met at all; (2) A value of 1 for the criteria/questions were met fraction; (3) A value of 2 for the criteria/ questions were met mostly; (4) Rated 3 for criteria/questions unanswered whole.

Table 1. Weights appraisal management B3 and B3 Waste

No.	Parameter	Weight (%)	Information
1	Permit Temporary Storage B3	2	
2	Amenities TPS B3	2	
3	TPS designs B3	2	
4	Special storage place B3	0.5	
5	Completeness MSDS B3	0.25	
6	SOP B3 Waste Management	0.25	
7	SOP Emergency Response B3	0.25	
8	Submission B3	0.5	
9	B3 Waste Utilization	2	
10	B3 Waste Treatment	2	
11	conditions Workshop	2	
12	oil Trap	1.25	
	Total	15	

Source: [11]

The division level of value also refers [11]. The division level value like this it would be more objective assessment, assessment methods like this then disobedience in a location made it seem as if another location has also become disobedient. Location devout rated remain obedient but then its value is reduced because there are locations that are not obedient.

Table 2. Rating Criteria Proper associated with Effectiveness

Ranked	Description / Effectiveness
Gold category with a value of 91-100	Mining Activities that have been doing environmental management more than required and have made efforts 3R (Reuse, Recycle, Recovery), implementing environmental management systems that are sustainable, and conduct measures to be useful for the society in the long run. **(Highly Effective)**
Green category with grades 71-90	Mining activity which has conducted environmental management more than required and have had an environmental management system, has a good relationship with the community, including efforts 3R (Reuse, Recycle, Recovery) **(More Effective)**
Blue Rating with grades 41-70	Coal mining has implemented control measures pencemarandan or damage to the environment and to achieve results in accordance with the minimum requirements **(effective)**
Red rank with a value of 21-40	Coal mining has been carrying out measures to control pollution or damage to the environment but do not achieve the results that correspond to As its minimum requirements stipulated in applicable legislation **(Ineffective)**
Black ranked with grades 0-20	Coal mining activities have not been carrying out measures to control pollution or damage to the environment and can cause pollution and environmental damage Atua **(Ineffective)**

Source: [4]

Blue Rating [4], Rating blue has a range of values 41% - 70%, meaning that if the total value of the contribution of the management aspects of B3 and B3 by 6% - 10.5% of the maximum value of 15%, the will get the value of the effectiveness of 41% - 70%.

With a value of 41% -70%, the performance can be said effective because it has met the minimum requirements set.

The higher contribution of the value achieved from the management aspect of B3 and B3 waste means more effective performance.

Added value test equipment

To measure whether the one-door policy B3 waste processing this add value or not, the authors take the following steps: (1) Gather Data B3 waste management costs per year for 5 years, in 2009-2014; (2) Looking for the unit cost by dividing the total cost per year with the amount of waste are managed so obtained waste management costs USD/kg; (3) Comparing unit actual costs incurred each year by the unit cost estimate who assumed management costs increased by 10% every year. The assumption is based on the increased cost of their workers' wage increases, increases in transportation costs and increased costs of waste processing at a third party.

RESULTS AND DISCUSSIONS

Management of hazardous and toxic waste (it's called B3 waste) Mining Company "X" (MC "X").

Most waste **MC "X")** originated from the workshop activity, the rest of B3 waste generated from mining other support facilities are laboratories, power plants, clinics, offices and other operations.

The following types of B3 waste generated from each activity.

Number of workshops and work units generating B3 waste in MC "X".

Corresponding number of units generating B3 waste, there are 46 units, this indicates that the point B3 waste it is very much.

The MC "X" does not impose a one-door policy B3 waste management, MC "X" should have at least 46 doors expenditure B3 waste and could have been more than 46 doors expenditure B3 waste because there are some units that have more than one work location.

Table 3. Types B3 waste produced by **MC "X"** and Contractors

Activity	Waste type B3
Heavy equipment maintenance workshop / light tools and workshop support	Used oil, used batteries, grease traces, hose contaminated, contaminated filters, contaminated items, fluorescent lamp, chemicals
Laboratory	Waste chemicals
Clinic	Medical waste
Power Plant	coal ash
office complex	Toner, dry battery, lamps TL
Other operating (pumps in mining operations, shipping operations, projects, etc.)	Used oil, used batteries, grease traces, hose contaminated, contaminated filters, contaminated items, fluorescent lamp, chemicals

Source: Department of the Environment MC "X", 2015.

Table 4. List of Workshop and Work Unit Producers B3 waste

No.	Work unit	No.	Work unit
1	MC "X" Excavator Maintenance Workshop D17	24	Workshop fuel stations Pama Pit
2	MC "X" workshop Mainshop	25	Workshop DIRE - Coal terminal
3	Workshop KPC Mobile Equipment	26	Joinery Contractors BUMA
4	MC "X" workshop Supporting Coal Terminal	27	Workshop fuel stations Thiess Contractors
5	MC "X" workshop CPP supporters	28	Joinery Contractor Thiess
6	MC "X" workshop Pit Stars	29	Thiess Contractors Against workshop Workshop
7	MC "X" workshop Pit Jupiter	30	workshop KontraktorTrakindo
8	MC "X" workshop Rebuild D13	31	Joinery Contractors United Tractor
9	MC "X" Solar Workshop	32	ISOS clinic
10	MC "X" workshop Fuel Station (6 locations):	33	Laboratory contractor UT Lab
11	Workshop and generator contractor Sewatama	34	laboratory Sucofindo
12	Workshop and Plant Contractor AEL	35	Operational Camp ISS
13	Workshop and Plant Contractor Orica	36	Operational Contractor TCP
14	Joinery Contractors Darma Henwa	37	BWP Air Operations Contractor
15	Workshop Fuel Station KontraktorDarma Henwa	38	Drill Drilling Operations Section
16	Joinery Contractors DMP	39	Operational Storage and Fuel Station SIC (4 locations)
17	Joinery Contractors Hexindo	40	Operational Repeater (4 location)
18	Joinery Contractors Intraco Penta	41	Tanjung Bara power plant (Power Station and workshops)
19	Joinery Contractors BWP	42	mine Stars
20	Joinery Contractors Liebherr	43	Mine Coal Mining
21	Light Vehicle Repair Service Contractors - TW	44	Hatari Mines AB
22	Pama Main Contractor Joinery Workshop	45	Mine Mining Service
23	Joinery Contractors Pama Soulmate	46	Jupiter Pit Mine

Source: Department of the Environment MC "X" , 2015

Standard Operation Procedure (SOP) Management B3 Waste.

MC "X" has developed a complete waste management procedures called Waste Management Handbook [7] , known as WMP or Waste Management Procedure. This handbook refers [6] on the protection and environmental management, waste management B3 [5], Government Regulation No. 74 of 2001 concerning hazardous and toxic materials, a ministerial regulation [5] and waste management "best practice" common enterprise.

One Door Policy B3 Waste Management MC "X"

Challenge MC "X" manage B3 waste are:

(a)Compliance aspects: (1) Target 100% adherence to regulatory provisions, in particular, Government Regulation no. 101 of 2014; (2) MC "X" is responsible for managing all of the B3 waste generated in the working area by KPC or by Contractor

(b)Kompleksitas: (1) B3 with a great number of types and different characteristics; (2) The amount of waste generated point by a considerable distance; (3) Some differences in waste management systems in some large contractors; (4) The number of people involved, especially as a producer of waste B3; (5) Detailed reporting to the government should be sent every 3 months.

Challenges above makes MC "X" set the one-door policy B3 waste management or one gate policy "Every single hazardous waste generated inside the which MC "X" lease, either by MC "X" or Contractor must be disposed of through KPC Licensed Temporary Hazardous Waste Storage". This policy is expected to facilitate the KPC to control B3 produced and adhere to Regulation 101/2014. B3 waste management concept of the door can be in Fig. 1.

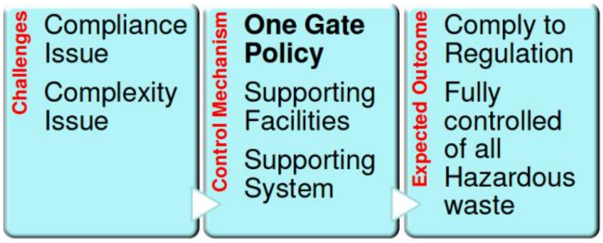

Fig.1. Waste Management Concept One Door MC "X"
Source: Ministry of Environment MC "X", 2015

Image flow above shows that the one-door policy is a tool for B3 waste management companies to face the challenges of compliance and complex conditions so that the target [5] can be achieved, in addition to the MC "X" can control very well the whole affair related to the management of B3 waste.

Assessment of compliance according to decree of the head of the environment no. 660.2 /K44 / 2014

Compliance Storage Temporary (TPS) B3.

Assessment of compliance with Temporary Storage Sites (TPS) B3 waste unlicensed conducted in eight (8) locations which are the exit B3 corresponding one-door policy B3 waste management at MC "X". In general, the overall polling rated obedient except for items eyewash facilities TPS in coal ash are not yet available. Some of the criteria included in the category, not applicable / NA, NA criteria will be assessed to obey.

Compliance B3 Waste Processing and Utilization

Assessment of compliance with the criteria of the B3 waste treatment is done at the facility Incinerator and processing facilities bioremediation of contaminated soil. Assessment of compliance with the utilization of B3 waste liquid is done on the utilization of used oil as a fuel substitute in blasting activities.

While the assessment of compliance with solid waste utilization B3 conducted on the use of coal ash as a mix of adobe, a mixture of concrete and road base.

Results of assessment of compliance with the processing and utilization of B3 waste are explained that processing and utilization of hazardous and toxic waste (B3) were considered adherent overall.

Compliance Storage of Liquid Fuels.

Assessment of compliance with a liquid fuel tank facility performed on seven (7) Department / Contractor is responsible for the storage and distribution of liquid fuels.

Some Department / Contractor has a liquid fuel storage locations of more than 1 (one) location.

Results of assessment of compliance with storage tanks of liquid fuel tank are explained that the storage facilities of liquid fuel tank rated obedient overall.

Compliance Warehouse Hazardous and Toxic Materials (B3) Special.

Assessment of compliance with warehouse facilities specifically B3 done on eight (8) locations that store hazardous materials and toxic waste (B3) in large numbers. Results of assessment of compliance with special B3 warehouse are explained that warehouse facility hazardous and toxic material (B3) specifically assessed adherent overall.

Compliance Workshop

Assessment of compliance with workshop facilities / workshop conducted on 27 (twenty-seven) depot location.

Results of assessment of compliance with workshop facilities are explained that the facilities workshop / garage rated obedient overall. Housekeeping at each workshop into the category of good to very good.

Compliance Oil Trap

Assessment of compliance against oil facilities trap performed on 27 (twenty-seven) depot location.

Results of assessment of compliance with special B3 warehouse is explained that oil facilities trap rated obedient except for wastewater utilization parameter oil trap with the closed circuit, the item is only 11 workshop adherent of a total of 27 workshops.

Cost management of hazardous and toxic waste (B3)

B3 waste management costs of nonhydrocarbon and grease

B3 waste management costs of nonhydrocarbon and grease in 5 years.

Table 5. Costs of Management of B3 Waste NonHydrocarbons and Grease on Period 2009-2014

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)
2009	83,130	49,053	0.59	0.59
2010	100,300	57,880	0.58	0.65
2011	111,240	61,508	0.55	0.71
2012	127,840	62,796	0.49	0.79
2013	252,450	115,944	0.46	0.86
2014	137,768	63,030	0.46	0.95

Data source: Environment Department MC "X", 2015.

Cost of B3 Waste Management Hydrocarbons

B3 hydrocarbon waste management costs in 5 years (2009-2014) are presented in Table 6.

Table 6. Management Costs of B3 Waste Hydrocarbon on Period 2009-2014

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)
2009	768,800	403,972	0.39	0.39
2010	957,130	319,609	0.30	0.43
2011	1,365,180	391,793	0.27	0.47
2012	1,589,740	406,281	0.24	0.52
2013	1,510,960	467,033	0.29	0.57
2014	1,467,830	424,440	0.27	0.62

Data source: Environment Department MC “X”, 2015

Discussion

Analysis of Compliance

Summary results of the study on the value of compliance achieved at each place Temporary Storage (TPS) waste Hazardous and Toxic Materials (B3 waste), processing and utilization of B3 waste, storage of hazardous and toxic (B3) records, storage of Liquid Fuels (BBC), workshop / garage and Oil Trap / Traps oil.

According to the results, the summary was found that almost all the parameters have met the criteria set up so that the full value of a value of 3 (three).

There are only two (2) parameters are not entirely meet the parameter i.e. complete facilities TPS in the form of eyewash in TPS Coal Ash / ash coal and utilization of waste water oil trap with the closed circuit, while the other parameters obedient in all locations.

A percentage value is set according to Decree of Environmental Center no. 660.2 / K44 / 2014.

To get the percentage in accordance with Decree of Environmental Center no. 660.2 SK / K44 / 2014 then use the following formula:

Value Percentage = (Value Compliance X Weight specified): 3

Value for compliance based on research results is then compared with the maximum weight corresponding analytical tools are delivered in the research analysis tools.

The results show the value compliance of B3 management and B3 waste was 14:30% of the maximum value of 15%, this means that for the aspects of the management of B3 and B3 scored 14.30 / 15, equivalent to 95.33% adherence to aspects of the management of B3 and B3 waste.

Table 7. Comparison of Maximum Weight with Research Result

No.	Parameter	Thickness Maximum (%)	Rating result (%)
1	Permit Temporary Storage B3	2	2
2	Amenities TPS B3	2	1.97
3	TPS designs B3	2	2
4	Special storage place B3	0.5	0.5
5	Completeness MSDS B3	0:25	0:25
6	SOP B3 Waste Management	0:25	0:25
7	SOP Emergency Response B3	0:25	0:25
8	Submission B3	0.5	0.5
9	B3 Waste Utilization	2	2
10	B3 Waste Treatment	2	2
11	conditions Workshop	2	2
12	oil Trap	1:25	0:58
	Total	15	14:30

Source: Research Result.

Value 95.33% indicates B3 and B3 waste management in MC “X” is very effective. This refers to the regulation 05 in 2004, mentioned criteria Ranked Proper in Category Gold with a value of 91-100 means that mining activity has made environmental management more than required and has made efforts 3R (Reuse, Recycle, Recovery), implementing management systems sustainable environment, and conduct measures to be useful for the society in the long term (Highly Effective).

Analysis of Value Added

NonHydrocarbon Waste delivery and Grease

B3 waste management costs are included in the category of NonHydrocarbon and Grease sent to a licensed business in the last 5 years and predictions of waste management costs assuming that each year there is a 10% increase in costs is presented in Table 5 and Figure 2.

Based on Table 8, which is also illustrated in Figure 2 can be seen that the unit costs (USD / kg) for the management of non-hydrocarbon waste and grease tends to decrease.

Cost management in 2009 was 0.59 USD / kg, the rate dropped to 0.58 USD / kg in 2010 and back down to number 0.55 USD / kg in 2011.

In 2012 unit costs continue to drop to 0.49 USD / kg, and fell back to the year 2013. 0:46 figures Unit cost 0.46 USD / kg persist in 2014.

Unit costs in normal conditions should have been increasing every year, it is possible because of the increased cost of wages, transportation costs, and wastes management costs. If the predicted waste management costs increased by 10% each year, then it should be the increased unit cost of 0.59 USD / kg in 2009 to 0.95 USD / kg in 2014.

By comparing the actual cost of the unit with the unit cost predictions assuming a 10% increase per year in the five years (2009-2014), the company managed to cut costs as presented in Table 8.

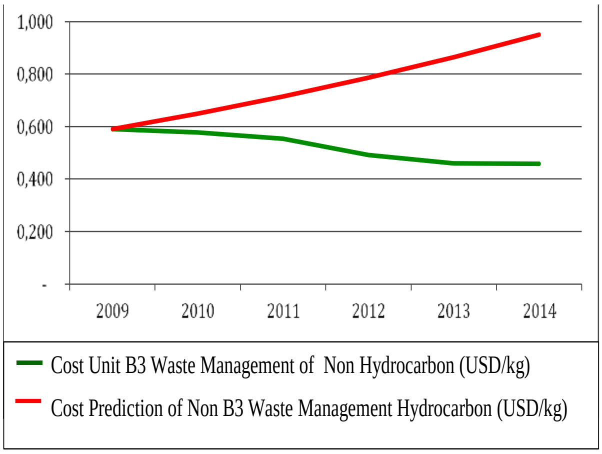

Fig. 2. Graph NonHydrocarbon Waste Management Cost and Actual Grease and Predictions
Source: Research Findings

According to table 8, the company managed to save the cost of USD 232,797 within 5 years (2009-2014), this is equivalent to a saving of 36% of the costs that should be incurred.

Cost management in 2009 0.39 USD / kg, the rate dropped to 0.30 USD / kg in 2010 and fell back to number 0.27 USD / kg in 2011. In 2012 unit costs back down to number 0.24 USD / kg, then experience the increase in the year 2013 where the unit cost is 0.29 USD / kg.

In 2014 the unit cost stands at 0.27 USD / kg. Unit costs in normal conditions should have been increasing every year, it is possible because of the increased cost of wages, transportation costs, and wastes management costs.

Table 8. Cost Savings Calculation of NonHydrocarbon Waste Management and Grease.

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)	Total Cost Prediction (USD)	Total Cost Prediction (USD)	Presentage Saving Cost (%)
2009	83,130	49,053	0.59	0.59	49,053	7,223	11
2010	100,300	57,880	0.58	0.65	57,880	17,917	23
2011	111,240	61,508	0.55	0.71	61,508	37,608	37
2012	127,840	62,796	0.49	0.79	62,796	102,155	47
2013	252,450	115,944	0.46	0.86	115,944	67,895	52
2014	137,768	63,030	0.46	0.95	63,030	232,797	36

Source: Research Findings

Delivery of Solid Waste Hydrocarbons

Waste management costs B3 category of solid waste hydrocarbons are sent to a licensed business in the last 5 years and predictions of waste management costs assuming that each year there is a 10% increase in costs is presented in Table 6 and Fig. 3.

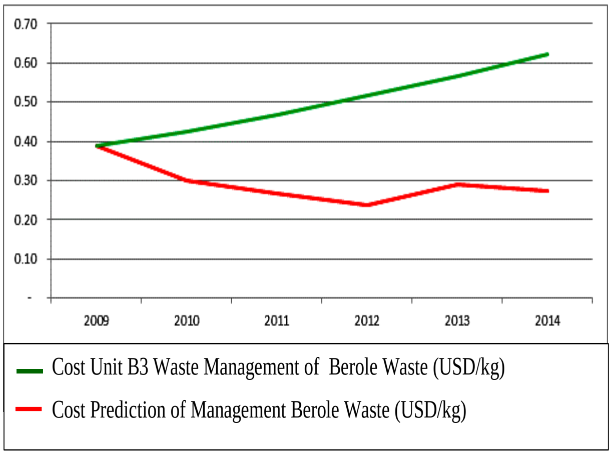

Fig. 3. Graph of Solid Waste Management Fee Actual Hydrocarbons and Predictions
Source: Research Findings

If the predicted waste management costs increased by 10% per year, then the unit cost of waste management amounted to 0.39 USD / kg in 2009 should be 0.62 USD / kg in 2014.

Comparing the actual cost unit with a unit cost predictions assuming a 10% increase per year in the five years (2009-2014), the company managed to cut costs as presented in Table 9.

According to Table 9, the company managed to save the cost of USD 1,899,293 within 5 years (2009-2014), this is equivalent to a saving of 44% of the costs that should be incurred.

Table 9. Calculation of Solid Waste Management Cost Savings Hydrocarbons

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)	Total Cost (USD)	Saving Cost (USD)	Presentage Saving Cost (%)
2009	768,800	403,972	0.39	0.39	403,972	-	-
2010	957,130	319,609	0.30	0.43	319,609	136,163	30
2011	1,365,180	391,793	0.27	0.47	391,793	300,178	43
2012	1,589,740	406,281	0.24	0.52	406,281	472,527	54
2013	1,510,960	467,033	0.29	0.57	467,033	444,203	49
2014	1,467,830	424,440	0.27	0.62	424,440	546,221	56

Source: Research Findings

Discussion Compliance

According to the results of compliance assessment across TPS B3 scored 14:30%, this means that for the aspects of the management of B3 and B3 scored 95.33% adherence to aspects of the management of B3 and B3. 14:30% by value, equivalent to 95.33% of compliance, the management aspects of B3 and B3 is considered very effective. It can be concluded that the one-door policy B3 Waste Management in MC “X” is considered very effective in fulfilling pp101 / 2014.

B3 waste management and highly effective is a positive point for the company's operations. With the fulfilment of all the requirements in accordance Government Regulation no.101 / 2014, the potential for the company to get operational constraints resulting from a mismatch of environmental management in the aspect of management of B3 waste to be small or non-existent.

Some important things are the key to success in the One Stop Waste Management Policy B3 so it is very effective in fulfilling Government Regulation no. 101 / 2014, are as follows:

(1) The number of polling stations was only 8 pieces make the achievement of compliance with the rules is relatively easier than if the number of polling stations owned more ie at least 46 polling stations (assuming each B3 waste has 1 polling stations). Control of the 8 polling stations much easier than the control of the 46 polling stations. Probability to comply with 8 polling stations is 1/8 or 0.125 or 12.5%. This means 1 polling stations obedient will receive the value of 12.5%. Meanwhile, if the number of polling stations by 46 then the probability obedient to every polling station is 1/46 or 0.022 or 2.2%. This means that if 1 polling stations obedient then only got 2.2%. This illustrates that the number of polling stations is less than the company easier to obey.

(2) One Door Policy B3 Waste Management requires that all waste producers follow an integrated waste management system. Thus the regulatory compliance easier to achieve.

(3) One Door Policy B3 waste management easier for the company to physically control the whole of B3 waste managed, not only to control the documents alone. This makes quality control over the management of B3 waste be much better.

(4) For the record, the procedure has not been set explicitly KPC terms TPS terms whether the addition should be done, if it is allowed what are the considerations and requirements. Besides a good understanding of the implementation of Single Window Policy B3 Waste Management should continue to be disseminated in particular to the party who is responsible for the management of B3 waste.

Discussion on the Value Added

Results of analysis show that the implementation of the One Stop Waste Management Policy B3 succeeded in providing added value in the form of cost savings amounting to USD 232,797 of the costs should be for Non Hydrocarbon waste and grease during the years 2009-2014, this is equivalent to saving 36%. As for the solid waste hydrocarbons which can be done cost savings of USD 1,899,293 or saving of 44% of the cost should be.

The added value provided by the imposition of one-door policy B3 Waste Management was very big that total savings of $ 2,132,089 within 5 years. Some important points to note One Door Policy B3 Waste Management can provide added value so great is:

(1)The amount of B3 that more would increase the bargaining power of companies that produce waste against third parties who carry out management of B3 waste. Thus unlicensed B3 waste manager will give management the most competitive price.

(2)B3 waste shipments are more optimal, as it is well known in the B3 waste storage period polling stations restricted 90 days while the amount of B3 that is sent in one 20 ft container is 80 drum. With the one-door policy, the amount of B3 will always attained one full container when sent to a licensed manager. If MC "X" did Policies One Stop Waste Management B3 B3 then perhaps that is not the full one (1) container to be sent, because the storage time is up. This will increase the cost of shipping.

(3)B3 waste handling jobs at the polling stations become more efficient because of the number of polling stations would require labor slightly less well.

CONCLUSIONS

Based on the results and discussion, we conclude the hypothesis is rejected for the following reasons:

(1) Policy One Stop Waste Management B3 in MC "X" has effectively towards the fulfillment of rules based on Government Regulation No. 101 of 2014. This is evidenced by the achievement of a Compliance value 95.33% to aspects of the management of B3 and B3

(2) One Door Policy B3 Waste Management in MC "X", adding value to the company. The added value is given in the form of savings of USD 2.132.089 of its reality costs incurred within 5 years (2009-2014).

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STEAMING TECHNOLOGY RATION PRODUCT IMPLEMENTATION AT PADJADJARAN LOCAL DUCK ON THE METABOLIZABLE ENERGY, DIGESTIBLE ORGANIC MATTER AND PROTEIN RATION VALUE

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Abstract

The implementation of ration product from steam technology at Padjadjaran local ducks on the metabolizable energy, digestible organic matter and protein ration value have been done in cage experiment and poultry production laboratory, while the metabolic and digestible test at Ruminant Nutrition and Chemical Feed, Faculty of Animal Husbandry Padjadjaran University, Jatinangor, Sumedang-West Java. The objective of the research is to have the metabolic energy, organic matter digestibility and protein ration value. The experiment has been conducted by using 20 birds local ducks Padjadjaran 18 weeks which birds obtained from Batujajar people farm area, West Java. The research methods used Student's t-test with two treatments and 10 replications, where R0 = ration without steam (control), and R1 = steam ration (Steel and Torrie, 1991). The metabolizable energy of steam ration (2684.64 kcal/kg) was significantly different (P<0.05) more highly significant than without steam (2075.60 kcal/kg). The Organic digestibility matter (95.43%) was significantly different (P<0.05) more highly than without steam (90.86%). The average of protein value digestibility which come from steam ration (71.19%) was significantly different (P<0.05) more highly than without steam (64.07%)

Key words: *digestible organic matter and protein value, metabolizable energy, Padjadjaran local ducks, steaming technology*

INTRODUCTION

Ducks are waterfowl that can be managed to produce a food source which come from animal protein. Its existence in egg production donors began glowing in urban community and give a contribution meat production also. Duck or duckbill has a specific part with their beak-shape, especially when there are looking for feeding. Ducks digestives system did not have a crop valve, and consequently with any food that enters to the digestive tract system will urge the foregoing food to be issued in the excreta form. Besides that, when taking some rations and be followed drinking and then excreting, that is why thus causing inefficiencies in using of ration.

Because of that phenomenon, it is necessary to find a new effort to solve the problem that had occurred in aquaculture farm development of local laying ducks. Ration steaming is one model which have been done by using moist heat. Cooking with moist heat leads to convection of heat transfer form hot steam to the ration (Labensky and Hause, 1999) [4]. The circulating steam caused the union of feed materials, formation where the whole of ingredients melt together, and finally among the feed material fused together.

The study about steaming is done by Skoch (1981), who is cited by Behnke (2001) [2] by making a trial between pellet making with steaming pellets and dried. The results showed that steaming feeds affected the durability, increasing feed intake and digestibility. By giving vapor pressure occured in low water content of raw material will occur starch granules fragmentation and homogeneity phase is called commonly gelatinization. The increased of moisture after steaming pressurized reflected starch granules which had been gelatinized as long as more of steaming (Maache-Rezzoug *et al.* 2009) [8]. The water content of high steaming ration will made ducks easily in ingredients digestibility, and then will enhance the digestibility both of organic matter even protein.

The nutritional feed ingredients content only giving the nutrition potential illustration, while the true nutrient value was determined from ingredients digestibility value. The digestibility values gives an overview of how much nutritional value is threw away or not digested, together with feces, urine, gas and other during digestion process. Ingredients nutritional quality could be determined from the amount of nutrients that could be digested and utilized by livestock both for growth and production.

MATERIALS AND METHODS

Materials and Research Tools

The subject research is ration without steam and steam ration for 40 minutes. Twenty layers ducks were used at eighteen weeks aged. Cages were used a metabolic cages as much as 20 units, with a size 60x40x50 cm. Feed traugh, drinking water and electric light just only for lighting. The transparent plastic to accommodate the excreta. Ohaus scales with of 310 and 2,610 g capacity in 0.05 g and 0.1 g accuracy were used for weighing the rations. Aluminum box was to hold the excreta dry. Spray equipment was used to spray the excreta with 5 percent of boric acid solution. Processing equipment consist of knives, scissors, and surgery plastic as well a cleaning equipment.

Metabolic Energy Measurement

Before the research began, all of any equipment were cleaned and disinfected. All cages were disinfected before the ducks were inserted. Every duck was place in individual cages by random. Aluminum foil is placed on bottom of cage to accommodate excreta. The procedure determination of metabolizable energy refers to the developed method by Sibbald and Morse (1983) [11].

Drink water was given in moderation and not fed for 24 hours. Steamed or not steamed ration were given 90 grams for each bird via force feeding. The excreta were accommodated by using aluminum foil boxes for 24 hours, and then were sprayed with 5 percent boric acid solution in every 2 hours. After that the excreta then were dried by sun rise. And then, the excreta were dried in the oven at 40-50^{0}C temperature as long as 24 hours, and later grinded. Afterwards the energy gross value was determined by using Oxygen Bomb Calorimeter. The energy metabolizable value was measured with the formula:

$$\text{EMn (kcal/kg)} = \frac{(Ebp\ x\ A) - (Je\ x\ Ebe) - \left\{\frac{(A\ x\ Np)}{100}\right\} - \left\{\frac{Je\ x\ Ne}{100}\right\}}{A}\ \text{x}\ 8.22$$

where:

EMn = metabolizable energy feedstuffs in retention nitrogen corrected (kcal/kg)
Ebp = gross feed energy (kcal/kg)
Ebe = gross energy of excreta (kcal/kg)
A = Total of feed ingredients that are consumed every ducks (g)
Je = Total of excreta (g)
Np = Nitrogen ration (%)
Ne = Nitrogen excreta (%)
8.22 = Constant energy value in retention nitrogen.

Digestibility Quality Test

The digestibility quality test was conducted to determine the experiment effect of steaming ration digestibility on nutrients value.

Research procedure

Twenty female ducks have been used for determination the energy metabolic of digestibility value in one week kept. Ten of female ducks were used for determination a ration of not steamed and ten of the other for determination a steamed ration where gave by force feeding via esophagus as much as 90 gram per bird. The faeces samples come from any ration were analyzed with Sklan and Hurwitz (1980) [10], which slaughter technique of treatment female ducks. Digested excreta ± 10 cm of ileum to avoid urine contamination. The large intestine were removed, both of the ends tried with ropes and the faecal samples of intestine were removed, then dried and the ingredients dried. Where the organic matters and protein nutrient were analyzed by proximate analytic. The indicator of lignin rations and feses was used by Van Soest Method (1979) [15]. To determine the digestibility value was used by Ranjhan (1980) [9]:

$$\text{Digestibility} = 100\% - 100\left[\frac{\%\ \text{lignin in ration}}{\%\ \text{lignin in feces}}\ x\ \frac{\%\ \text{nutrient in feses}}{\%\ \text{of nutrient in ration}}\right]$$

Variables Observed

(i)Organic Materials Digestibility

Organic matter digestibility value is calculated based on the formula:

$$\text{Organic matter digestibility} = 100\% - 100\left[\frac{\%\ \text{lignin in ration}}{\%\ \text{lignin in feces}}\ x\ \frac{\%\ \text{organik matter in feces}}{\%\ \text{organik matter in ration}}\right]$$

(ii)Protein digestibility

Protein digestibility value is calculated based on the formula:

$$\text{Protein digestibility} = 100\% - 100\left[\frac{\%\ \text{lignin in ration}}{\%\ \text{lignin in feces}}\ x\ \frac{\%\ \text{crude protein in feces}}{\%\ \text{crude protein in ration}}\right]$$

(iii)Statistic analysis

The variable treatment effects were analyzed with *Student's t-test* (Steel and Torrie, 1991) [13].

RESULTS AND DISCUSSIONS

The treatment effect on Metabolic Energy Value.

The average value of metabolizable energy content of steamed and not steamed ration are presented in Table 1 and showed that the energy metabolic value of steamed (2,684.64 kcal/kg) more higher than not steamed (2,075.60 kcal/kg) or 29.34 percent increased.

Student's t-test indicated that steamed metabolizable energy ration is significant higher ($P<0.05$) than not steamed ration.

Because of steamed ration, the nutrient composition changed, and because of this made higher the digestibility. At the end, made very close between the energy metabolizable with the ration digestibility (Mc. Donald *et al*, 1978) [6]. And besides that, the nutrient had big effect to the digestibility, because high of crude fiber cannot digestible by the bird (Wahju, 1997) [16].

Table 1. Metabolic Energy Mean Value

Replication	Not Steam Ration (kcal/kg)	Steam Ration (kcal/kg)
1	2,082.97	2,686.45
2	2,052.00	2,680.01
3	2,090.05	2,678.00
4	2,061.92	2,686.86
5	2,077.84	2,683.37
6	2,076.75	2,680.92
7	2,079.16	2,689.72
8	2,082.52	2,685.90
9	2,068.25	2,689.60
10	2,084.56	2,685.60
Total	20,756.02	26,846.43
Average	2,075.60	2,684.64

So, steaming is able to make increase the energy metabolizable for improving cellulose and hemicellulose solubility or degradation of substance exemption of lignin and silica (Murni *et al*, 2008) [7].

The Effect of Organic Compound Digestibility. The digestibility of organic compound is closely with the dry matter, because the dry ingredients are organic matter that consist of crude protein, lipid, and crude fiber and Free Nitrogen Extracted. The average organic matter digestibility calculation measurements are presented in Table 2.

The statistical test results of *student t-test* showed that steamed organic matter digestibility is more higher ($P<0.05$) than not steamed ration. The increased of dry matter digestibility lead the rise of organic matter and vice versa (Syaro, *et al*., 2005) [12]. High and low digestibility of feed ingredients give a meaning about how much nutrients feed contains in a form that could be digested in the gastrointestinal tract (D'Mello, 2004) [3]. The digestibility factors affecting in feed material, because of temperature, speed of ration goes through digestive tract, physical of ration, and ration composition (Anggorodi, 1984) [1].

Table 2. The Organic Materials Average of Ration Digestibility

Replication	Not Steam Ration (kcal/kg)	Steam Ration (kcal/kg)
1	90.76	95.45
2	90.65	95.89
3	91.20	94.93
4	90.86	95.79
5	90.98	95.57
6	90.78	95.05
7	90.69	95.54
8	91.21	95.47
9	90.72	94.97
10	90.78	95.65
Total	908.63	954.31
Average	90.86	95.43

And also because material ration of chemical composition, crude protein digestibility, feed preparation, type of livestock and feed amount (Tillman, *et al*., 1998) [14].

The Effect of Protein Digestibility Treatment. The average value of crude protein ration digestibility about steamed and not steamed are presented in Table 3. The average value of steamed crude protein ration digestibility 71.19 percent is higher than not steamed just 64.07 percent or 11.11 percent increased.

Table 3. The Average of Protein Digestibility

Replication	Not Steam Ration (kcal/kg)	Steam Ration (kcal/kg)
1	63.82	70.85
2	63.87	70.94
3	64.52	71.58
4	63.92	70.92
5	64.43	71.59
6	64.26	71.22
7	63.78	71.05
8	64.34	70.90
9	64.09	71.43
10	63.72	71.39
Total	640.75	711.87
Average	64.07	71.19

Statistical analysis showed that crude protein digestibility values is different and significantly higher ($P<0.05$) than not steamed. The physical processing technology ration by steaming caused gelatinization during steaming process, thus makes water absorption increased, the ration become more softer, and caused the nutrient digestibility of diet such proteins and carbohydrate also increased. Steaming process is able to destroy cellulose, hemicellulose and lignin bonds, that is why their chemical composition unchanged. Protein and carbohydrate digestibility improved and give a signal that steaming ration product is absorbed more nutrient content of the ration (Murni *et al*., 2008). The specific characters of protein and amino acids which come from a variety of materials with good heating process give very easily digest, while when more steaming would made the digestibility of the feed reduce (Lesson and Summers, 2001) [5].

CONCLUSIONS

Based on the results of research and discussion, it can be concluded that by steaming ration makes the quality of feed increased and significant effects on metabolic energy, organic matter and crude protein digestibility.

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THE LACTIC ACID BACTERIA AND YEAST EFFECT ON TOTAL BACTERIA, ACIDITY DEGREE AND WATER ACTIVITY OF CULLED LAYING HENS SALAMI

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Abstract

The research has been done in the Laboratory of Products Processing Technology - Faculty of Animal Husbandry - Universitas Padjadjaran, Bandung. The research was conducted using culled Isa Brown laying hens, obtained from Private laying hens farm, Sumedang, West Java- Indonesia. The experiment method using Completely Randomized Design (CRD) with 5 treatments and 4 replicates i.e. P0 = 2% Lactic Acid Bacteria (LAB) + 0% yeast, and without spices; P1 = 2% LAB and 1% yeast; P2 = 2% LAB and yeast 2%, P3 = 2% LAB and 3% yeast; P4 = 2 % LAB and 4% yeast, followed by Duncan's Multiple Range Test. Results indicated that salami bacteria total, were significant difference decreased when the yeast percentage as starter increased : P0 (5.08 x 10^4cfu/g); P1 (5.06 x 10^4cfu/g); P2 (4,97 x 10^4cfu/g) ; P3 (4.93 x 10^4cfu/g) and P4 (4.91 x 10^4cfu/g). The salami average pH, on P0 = 5.39; P1 = 4.54; P2 = 4.37; P3 = 4,3 and P4 = 4.24, also decreased as the yeast increase. At last, the mean of salami water activity, on P0 = 0.986; P1 = 0.966; P2 = 0.959; R3 = 0.946 ; and P4 = 0.953. In general, the P4 treatment give the best culled laying hens salami.

Key words: *lactic acid bacteria, pH, total bacteria, salami, water activity, yeast*

INTRODUCTION

Today, the needs for food around the world was raised. Chicken meat is one of food source of animal protein for humans. Every year was reported that the needs of chicken meat in Indonesia also continues to increase, as the most widely traded commodity, so the demand of food safety of its products need to be improved. At the other side, the chicken is a perishable food, easily damaged due to the high nutritional content (Simmons, 2014) [13].

In Indonesia, producing traditional foods and fermented by yeast not yet entrenched in using bacteria and fungi such as *Rhizopus, Aspergillus spp, Penicillium spp, Mucor spp,* and others, compared to lactic acid bacteria (LAB) as starter, which is usually used as a probiotic. Utilization of yeast is rarely small, especially on a few types such as *Saccharomyces cerevisiae, Kluyveromyces lactis / Kluyveromyces kefyr* and *Zygosaccharomyces spp.*, for making bread, wine, soy sauce, salted vegetable, and some traditional food e.g. tape and brem. In some European countries the use of yeast in fermented products, especially milk, and other products are common. The existence of yeast in food is very difficult to avoid, but should be considered, given the yeast capable contributing positively to shelf-life of the fermentation products. Positive role in the fermentation products is very diverse, among others, the fermentation process in sausage (salami).

Salami or fermented sausage is a processed meat product, mixed meat with fat through a process of fermentation using lactic acid bacterial culture, that able to convert the carbohydrates into lactic acid. Salami is meat product that easily damaged (perishable food), so it need special handling to extend the keeping of the product, e.g. preservation. Preservation usually used chemicals, but it was toxic and carcinogenic, which harmful to human health. Now, using biological material as preservative material (bio-preservative), using the microorganisms activity or their metabolites result as an antimicrobial agent. Culture of microorganisms could be lengthen the shelf life of meat products as a result of acid formation Heinz and Hautzinger (2007) [5].

Fresh meat, generally contaminated with large amounts of bacteria including pathogenic bacteria, such as *Salmonella sp, Escherichia coli sp, Staphylococcus aureus* and other bacterial pathogens. Fresh meat can also be contaminated by the extent of yeast population and also the fermented meat. Soon after slaughtered, the pH of meat, ranges from 6.8 to 7.2, and then decline because of lactic acid accumulation in muscle tissue as a result of anaerobic glycolysis process. Then the pH increase, because of microorganisms growth. The pH of chicken meat will reach 5.8 to 5.9 after post-mortem, between 2 - 4.5 hours, but in ambient temperature, or at high temperatures, the pH will drop quickly, or by the physical condition of muscle tissue (Muchtadi and Sugiyono, 1992) [10].

Culled hens meat generally have a tough and hard, and smells difference than the smell of broilers or fresh chicken meat. In addition, the lack of consumer interest in culled hens, because the process has not been accustomed in a variety of variations to be preferred by consumers. Therefore, culled hens meat, must processed in other style, into salami or sausages. However it is necessary to study the changes that should appeared are safe for consumption, by total bacteria counts, acidity (pH) and water activity (a_w) of the product. From the processing point of view, meat with pH 5.6-6.0 is better for products where good water binding is required, looks like sausages, as meat5 with higher pH has a higher binding capacity (Heinz, and Hautzinger, 2007) [5].

Science and technology must spearhead agricultural production in the next 30 years, as a pace faster than the green revolution did during the past three decades. This is an unacceptable situation today and will require a new approach to food production to avert an even worse scenario in the coming decades (Simmons, 2014) [14].

MATERIALS AND METHODS

Raw Materials and Sausage Preparation

The Isa Brown culled layer hens, were obtained from the Private laying hens farm, Tanjung Sari Sumedang, West Java-Indonesia. The meat and chicken fat was kept overnight in refrigerator and the meat was manually deboned. The other materials, spices, salt, sugar, garlic, ginger, pepper, nutmeg, cornstarch, powdered milk were purchased from a local wholesaler also in Tanjung Sari Sumedang, West Java-Indonesia. *Trichosporon beigilii* (yeast) used as starter, and lactic acid bacteria, was isolated from culled laying hens meat.

Formulations Methods

Five formulations of culled layer hens were prepared, were repeated five times in a completely randomized design. The sausage dough, the meat : fat is 80: 20 was mixed after frozen for 24 hours. After ground and mixed carefully with food processor, then added with spices, salt, sugar, garlic, ginger, pepper, nutmeg. The sausage dough was added with 2% lactic acid bacteria, then separate into five parts according the treatments (P0, P1, P2, P3 and P4). Each treatment was also added with yeast (*Trichosporon belgilii,* that was isolated from meat of culled hens) in accordance with the treatment that is 0% (P1), 1% (P2), 2% (P3), 3% (P4) and 4% (P5). The dough was added with cornstarch, powdered milk and chicken fat then mixed carefully and stuffed into the casing and tied up. The pH, a_w, moisture content (physico-chemical), and total bacteria (microbiological). The resultant mixture was filled in casings, and then hung on a rack and allowed for 24 hours at room temperature and keep for six days so the fermentation allowed and interspersed with the process of curing for one hour per day. The temperature during curing is maintained at 27 - 30°C in the fumigation chamber using coconut shells, when the temperature exceeds more than 30°C, the room was spray with ice water.

The tools, are: Philips HR 7620 Food Processor, for grind, and mixed the sausage dough, minimum and maximum thermometer to measure the room temperature, stuffer filler, Nalo Faser casing size of Lange Calibre 45 60.0 Menge 25 Germany and O'haus storage scale. Research has been conducted in the Laboratory of Animal Products and Processing Technology Research and Testing Laboratory at Faculty of Animal Husbandry Universitas Padjadjaran, Bandung between September 2015 to December 2015.

Physico-chemical analysis

The physico-chemical analysis (pH, a_w), were determined according to AOAC standard procedures (1990), was performed in duplicate. For the determination of pH, 10 g of each sample was homogenized with distilled water in the ratio of 1:10. The homogenate was subjected to a pH test using pH-meter. The pH value was determined on production days by taking the average of two readings. Water Activity System apparatus was used to measure the water activity (a_w). The a_w values were determined in duplicate in order to optimize the weights of samples at 25^0C until equilibrium was reached.

Microbiological analysis

To evaluate the microbiological characteristics, aliquots of 25g were collected, homogenized with 225 mL of 0.1% peptone water, and serially diluted on a decimal scale. The microbiological analyses were performed in duplicate. The data was transformed into alogarithm of the number of colony-forming units ($cfug^{-1}$). Total Plate Count (TPC) for determination of the number of viable microorganisms in the sample (Marturin and Peeler, 2001) [9] .

Statistical analysis

The experiment, used a completely randomized design and was repeated five times. All analyses were performed in duplicate, and the data was evaluated through an analysis of variance (ANOVA). The means were compared by Tukey's test at a confidence level of 5% ($p \leq 0,05$) .

RESULTS AND DISCUSSIONS

Effect of Treatment on Sausage Total Bacteria. The results of the analysis of the treatment effect using starter yeast and lactic acid bacteria on sausage bacteria total are presented in Table 1.

Table 1. Culled laying hens Salami total bacteria with various treatments

Replication	Treatments				
	P0	P1	P2	P3	P4
	…...……………………… X 10^4 colonies/gram …………………….				
1	12.97	11.12	9.13	6.73	7.47
2	12.62	11.23	9.12	8.67	7.72
3	11.23	10.87	9.57	9.51	8.78
4	11.92	12.27	9.35	8.92	8.54
Total	48.74	44.49	37.17	33.83	32.51
Average	12.19	11.12	9.29	8.46	8.13

Table 1 showed that the total bacteria were decrease as the percentage of yeast as starter in culled laying hens salami.

The total bacteria between 8.13 x 10^4 cfu/g to 12.19 x 10^4 cfu/g.

The lowest total bacteria was obtained in treatment using 4% yeast (P4) 8.13 x 10^4 cfu/g; and the highest was obtained in R0 treatment (0% yeast) is 12.19 x 10^4cfu/g.

The data from Table 2 showed that the total bacteria of salami decreased, as the percentage of starter yeast increased.

Analysis of variance showed that the starter yeast used in chicken salami has significant effect ($P \leq 0.05$) to total bacteria.

Duncan's Multiple Range Test was conducted to determine the influence of different yeast percentage, in salami total bacteria, as seen in Table 3.

Based on the data in Table 3, it appears that the *lactic acid bacteria* and *yeast* as salami starter in treatment (P4), has the same effect with the treatment (P3) starter yeast 3%, while treatment (P3), 3% starter yeast was not significantly different with the treatment (P2), 2% yeast starter.

Table 2. Total bacteria transformation logarithm of culled laying hens salami with various treatments

Replication	Treatment				
	P0	P1	P2	P3	P4
	……………………………X 10^4 colonies/gram …………………………..				
1	5.11	5.05	4.96	4.83	4.87
2	5.10	5.05	4.96	4.94	4.89
3	5.04	5.04	4.98	4.98	4.94
4	5.08	5.09	4.97	4.95	4.93
Total	20.34	20.23	19.87	19.70	19.63
Average	5.08	5.06	4.97	4.93	4.91

Table 3. Duncan's Multiple Range Test Results Effect of Treatment on Total Bacteria Salami

Treatments	Total Bacteria (x 10^4 colonies / gram)	Significancy $\alpha_{0,05}$
P0	5.08	a
P1	5.06	a
P2	4.97	b
P3	4.93	bc
P4	4.91	c

Treatment P0, with 0% starter yeast, and the treatment P1, with 1% yeast starter did not significant differences (P ≥ 0.05). It shows, that the increase of yeast starter since 3% gave significant effect on the total bacteria of culled laying hens salami, but the salami under 2% yeast as starter, has no significant differences. Total plate count in native chicken sausages using some oil and fats, between 5.25 ± 0.01 with corn oil to 5.37 ± 0.02 with beef fat, (Lengkey, et al., 2016) [6] means that this results (using culling hens) is good choice as meat sources.

The use of lactic acid bacteria and yeast as a starter to culled hens salami fermentation is very advantageous, because it is an anti-synergic to pathogenic microbes, in line with Lindren and Dobrogosz, (1990) [7]. Ray (2004) [11] reported that the anti-synergic growth with two or more microorganisms in food, could have effects on the growth of microorganism, also will intervene the growth of one or more types of microorganisms; sometimes will kill the microorganism. Further said, that the growth of anti-synergic could be found on some strain of microbes, including the bacteria with yeasts, molds and yeasts or fungi and bacteria.

Roostita *et al*., (2013) [13] reported that the addition of 2% crude yeast extract as bio-preservative in sausage products; is proven to produce the lowest of total bacterial population (1.7 x 10^3) that affect the storability at room temperature, which reached six days and also at refrigeration temperatures up to 60 days. Arief, *et al.*, (2008) [2] said that the average of total lactic acid bacteria in beef and mutton fermented sausage are 1.93 x 10^{12}cfu/g and 5.73 x 10^{10}cfu/g respectively, by using dried culture of *Lactobacillus plantarum* 1B1.

Effect of the Treatment on Salami pH

The analysis result of the treatment, using yeast and lactic acid bacteria as starter on the pH of salami sausage, is presented in Table 4.

Table 4. The pH of culled hens salami with various treatments

Replication	Treatment				
	P0	P1	P2	P3	P4
	…………………… …… X 10^4 colonies/gram ………………………..				
1	5.59	4.30	4.29	4.29	4.21
2	5.33	4.26	4.37	4.32	4.24
3	5.15	5.26	4.39	4.35	4.13
4	5.49	4.35	4.42	4.22	4.38
Total	21.56	18.17	17.47	17.18	16.96
Average	5.39	4.54	4.37	4.30	4.24

Based on Table 4, when the yeast as the culled layer hens starter, increase than the pH will decrease. The average of pH of culled layer hens salami that using yeast and lactic acid bacteria as starter, ranged from 5.39 to 4.24.

The results of variance analysis showed that using yeast and lactic acid bacteria as starter, will provide significantly different effect ($P \leq 0.05$) on the salami pH. The results of analysis of variance showed that the starter yeast used in culled layer hens salami, has significant effect ($P \leq 0.05$) on the sausage pH. By Duncan's Multiple Range Test, to determine the effect between different percentages of salami yeast on the pH of culled layer hens, was gave in Table 5.

Table 5. Duncan's Multiple Range Test, the Effect of treatment on the Salami culled layer hens pH

Treatment	PH	Significant $\alpha_{0,05}$
P0	5.39	a
P1	4.54	ab
P2	4.37	ab
P3	4.30	ab
P4	4.18	b

The final pH value of culled layer hens salami, in this study is more acidity (4.18 to 5.39) than the final pH of usual salami, mostly European – style (4.8 to 5.0) (Lucke, 1997) [8], but for some types of sausages such as summer sausages, German sausages, Bologna and cervelat the pH between 4.4 to 5, still acceptable (Rose, 1982) [12]. A decrease in pH, resulting from the addition of acid in foodstuffs or meat, will give a distinct advantage. Foods with low pH is more likely to be stable against microbial damage compared with a neutral pH (Frazier and Westhoff, 1998) [4]. Meat that has high pH, generally is very good for bacteria growth (Aberle, *et al.*, 2001) [1].

Effect of treatment on water activity (a_w)

The effect of treatment on salami water activity, using lactic acid bacteria and yeast as starter is presented in Table 6.

Table 6. The Effect of Treatment on Culled Layer Hens Salami Water activity (a_w)

Replication	**Treatment**				
	P0	P1	P2	P3	P4
1	0.995	0.955	0.954	0.882	0.948
2	0.977	0.962	0.946	0.988	0.966
3	0.971	0.978	0.979	0.956	0.952
4	0.989	0.968	0.958	0.959	0.947
Total	3.942	3.863	3.837	3.785	3.813
Average	0.986	0.966	0.959	0.946	0.953

The data on Table 6 showed as the percentage yeast in the treatment of culled layer hens salami increased, the water activity (a_w) tends to decrease. Analysis of variance showed that the treatment using of lactic acid bacteria and yeast as starters on culled laying hens salami showed no significant differences ($P \geq 0.05$) on water activity.

Water activity (a_w) is the amount of free water that can be used by microbes for growth (Winarno, 1991; Syarief and Hamid, 1993) [17, 16]. Water activity is the amount of water in the material available for microbial growth. High water activities have an impact on the increasing of microorganisms number in foodstuffs (Syarief and Hamid, 1993) [16]. In this study, there is a tendency to decrease water activity as the yeast increased, but in R4 treatment (4% yeast), the water activity increased again to 0.953, although has no statistically significant differences ($P \geq 0.05$). The a_w value of fermented sausages ranged from 0.85 to 0.93 (Sopandi, 2014) [15].

CONCLUSIONS

The results indicated that the total bacteria of culled laying hens salami was significant difference decreased as the percentage of yeast as starter increase, P0 (5.08 x 10^4cfu / g), P1 (5.06 x 10^4cfu/g), P2 (4, 97 x 10^4cfu/g) P3 (4.93 x 10^4cfu/g) and P4 (4.91 x 10^4cfu/g).

The average pH of salami decreased as the percentage of yeast as starter increase (P0 = 5.39; P1 = 4.54; P2 = 4.37; P3 = 4.30 and P4 = 4.24). The decreasing of pH gave significantly different with culled layer hens salami using yeast and lactic acid bacteria as starter, for each treatment.

The mean of water activities (a_w) in each treatment decreased as the yeast and lactic acid bacteria as starter, increased; {P0 (0.986); P1 (0.966); P2 (0.959); R3 (0.946) and P4 (0.953)}, even from P3 treatment and also P4, the water activity was decreased, although has no significant differences statistically.

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THE STRUCTURE OF AN ENTOMOFAUNA CHARACTERISTIC FOR A SPONTANEOUS MEADOW IN SIBIEL VILLAGE (SIBIU, ROMANIA)

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Abstract

This paper complements previous studies characterizing the useful and harmful insect species existing in different types of ecosystems in the village of Sibiel (Sibiu). The study presents quantitative relations resulted from the ecological typology established by observations and research. Research related to the application of the information theory in knowledge of the biota structure of a grassland ecosystem, with quantities and qualitative ratios related to useful and harmful fauna for the studied meadow have not taken any further. The present study is a beginning knowledge of entomofauna specific for spontaneous grasslands, providing useful data for those interested in setting a system of integrated pest control in these biotas.

Key words: *entomofauna, Sibiel village, Sibiu, Romania*

INTRODUCTION

Although natural grassland area of our country does not exceed 4 mil, ha, their entomofauna is not widely known. Over time they were studied by: [1-6,11-13,22].

research focusing the behavior of phytophageous species, studies on pests of fodder, the entomofauna structure and dynamics of forage crops, especially grassland perennial grasses cultivated and spontaneous.

This paperwork complements the research in the area of Sibiel (Sibiu) and implicitly of Romania. Over the years the author has conducted studies on populations of insect orders Coleoptera [7,14-22] and Lepidopetera [24-34, 39].

The analysis of wild flora highlights nine economically [8-10,37,38] distinct groups, namely the group of meso-hydrophytes which include *Agrostis tenuis* and a group of *Festuca pratensis,* which grow in well aerated places. In sandy areas grow mesophyll species such as: *Poa pratensis, Plantago lanceolatum, Achillea millefolium, Campanula patula*, but also less mesohygrophilous herbaceous plant species such as *Agrostis alba, Deschampia cespitosa and Ranunculus repens*. [35,36]. The most important association in this grassy layer is *Holcus lanatus*, together with other species of: *Agrostis stolonifera, Carex vulpina and Alopecurus pratensis*. Due to the high number of mesohygrophilous and hygrophyte species, the studied grassland falls into the association of *Agrostideto-Festucetum pratensis* [23].

Fig. 1. Natural grassland area in Sibiel (Sibiu) orig.

MATERIALS AND METHODS

For knowing the entomofauna in the studied meadow it was used threading technique, by means of entomological net. The material captured from April to September 2015 was systematically grouped, labeled and determined the species. To express quantitative relationships and group relationships between species in the ecosystem were used analytical idea (abundance and dominance) which enable the structure and role of different species in the biota activity studied.

Fig. 2. Important association in this grassy layer (orig.)

RESULTS AND DISCUSSIONS

In terms characteristic of 2015, entomophauna captured in grassland at the edge of the village Sibiel (Sibiu) has been divided in harmful and useful one.

Fig.3. The studied grassland, images from each month collection September 2015 (orig.)

In the meadow analyzed were seized 475 copies of 42 species belonging to 6 systematic insect orders. Of the 475 specimens, 81.4% are damaging wildlife. The heterogeneity index reflects a substantial increase in pest distribution:

$$R = FU / FD = 24.3\%$$

Pest insect belonging to the following orders:

Ord. DIPTERA: 174- 8 species dominating 36.63%, Fam. Chloropidae (*Meromyza nigriventris* 17.3%) and 5.4% *Tipula oleracea*.

Ord. COLEOPTERA: 86 copies-9 species 18.10%. Most representative of this order were species belonging to Fam. Chrisomelidae with *Phylotetra atra* species 4.6%, following Curculionoidae family with *Hypera nigriventis* species 2.4%.

Ord. HOMOPTERA, with 63 copies and 6 species 13.26. The most important number belonged to Fam. Cicadellidae, Psammotettix striatum, 2.8%.

Ord. THYSANOPTERA, with 32 copies, 3 species-6.73%. Best represented are copies of Fam. Thripidae (Chirotrips denticaudus, 28 specimens 7.6%)

ORD. HETEROPTERA with 21 specimens belonging to 3 Species 4.42%, the most important families were: Fam. Pentadonidae (Eurydema eleraceum-3.2%).

Ord. HYMENOTERA with 4 copies, 0.84%, 1 species in Fam. Cimicidae.

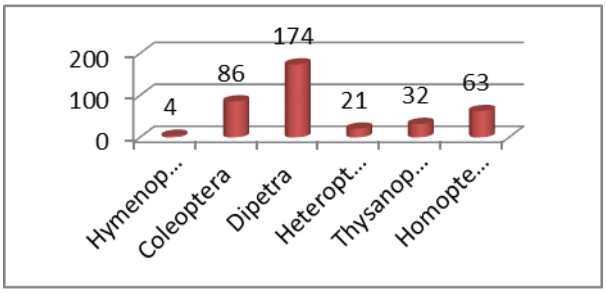

Fig. 4. The structure of entomophauna (Species)

Reduced diversity of useful entomofauna was influenced by climatic factors features of 2015.

In the analyzed meadow from the total of 475 specimens 97 specimens were captured, 18.6%, 11 species belonging to useful entomofauna.

The 97 copies were grouped into five insect orders. **Ord. HYMENOPTERA** 34 copies-3 species 6.7%. Fam. Formicidae (*Formica rufa*) -19 copies 4,3%.

Ord. COLEOPTERA 29 copies-4 species 4.8%, Fam. Halticidae (*Halticus maculatus*, 11 copies, 2.6%).

Ord. DIPETRA-19 copies-3.9%.

Ord. HETEROPTERA-9 copies, 2 species 0.1%

Ord. NEUROPTERA-6 copies-1.6%.

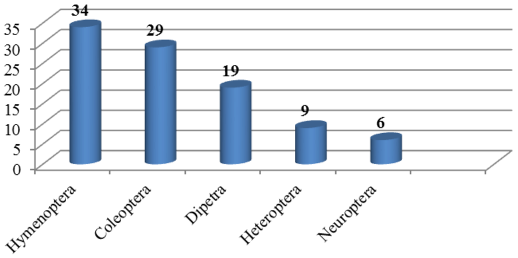

Fig. 5. The structure of entomophauna (Copies)

Among the arthropods were captured a few entomophages. Of these 43 species, 8 species-17.9%. Entomofauna was synthesized in four orders:

Ord. HYMENOPTERA-27 copies-3 species 11.6%.

Ord. COLEOPTERA- 5 copies-2 species 1.7%.

Ord. HETEROPTERA-4 copies -2species 2.2%.

Ord. DIPTERA-4 copies-3 species 2.7%.

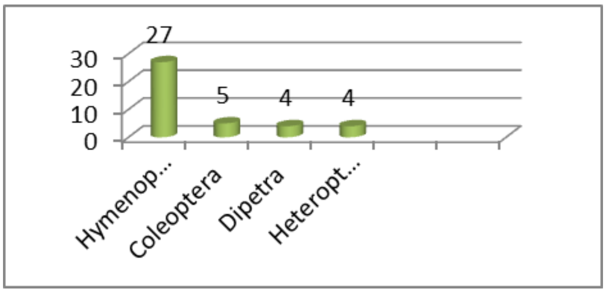

Fig. 6. Faunal composition of insects (Families)

CONCLUSIONS

In terms of 2015 after research of entomofauna characteristic of a meadow ecosystem in the village of Sibiel (Sibiu) were established: the structure, abundance, dominance and dynamics of insect species belonging to 7 orders and a total number of 475 copies. 81.4% of centralizing data obtained are damaging wildlife species (Fig.4) and 18.6% are useful wildlife species (Fig.5). Maintaining biological balance of the agronomical ecosystem of a spontaneous grassland play an important role in the presence and activity of entomophagus species (Fig.6), especially that of the predatory insects.

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STUDY ON CARABIDAE FAUNA (COLEOPTERA: CARABIDAE) IN A FOREST BIOTA OF OAK IN SIBIU (ROMANIA)

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Abstract

The paper presents the results obtained in 2015 from May to October, by capturing the soil traps type Barber and adapted by the author made of recyclable material, 2l and 1.5l bottles of pet, of the epigenous arthropods in the oak forest of Sibiu Grove. This renders the research results and study refers only to species belonging to the family Carabidae, amounting to a total of 283 exemplares belonging to 14 species. Benea the the entomofauna structure there are some interpretations of abundance and dominance, phenology research and ecological interpretations, ethological, biological and references on food regime.

Key words**:** *Carabidae, entomofauna****,*** *Dumbrava Sibiului Forest, Sibiu- Romania*

INTRODUCTION

Thorough research on the structure and activity of the epigenous entomofauna based on an ordered system of catching traps were started within biota cultivated with sugar beet in 1997, which over the years has been expanded into other agrobiotas and forest biotas after the system in Brasov [5]. We cannot overlook the fact that in our country there have been extensive studies on Coleoptera fauna [1-4,11-17] specifically and systematically spread with few elements of ecology are addressed especially in the works of [6] and generally the epigenous entomofauna, but collections were strictly on fauna not having an own the system of collecting in interpreting relations in general and the trophic special survival. The natural complex of Sub Arini, Dumbrava Sibiu were also made collections of insects and especially Coleoptera, material, some of which are in the collections of the Museum of Natural Sciences in Sibiu, partially published by members of the Naturalists Society in Transylvania, referring it specifically to structure and distribution.

MATERIALS AND METHODS

In this paper it is presented the beetle biology and evolution of species in a biotope well defined at the edge of the city of Sibiu, Sibiu Dumbrava oak forest in terms of collection we used traps 2015. The traps used were Barber which were made of recyclable material (PET bottles) easy to use and resistant to water and detergent which we introduced to odorless insect that is not repellent for the insects [7,14-16, 23]. It was used a set of 25 traps placed at 50-100 m spaced, spread over an area of 3-4 km^2, which we regularly inspected every 7-10 days, from April to October by doing so, a total of 20 collections, as follows: 19.05, 29.05, 4.06, 20.06, 17.06, 24.06, 30.06, 9.07, 18.07, 2.08, 7.08, 13.08, 21.08, 28.08, 10.09, 22.09, 2.10, 11.10, 21.10, 30.10., all with 2015.

RESULTS AND DISCUSSIONS

In total 283 specimens were collected belonging to the genus Carabus and 14 species were identified (Table 1).

Table 1.Variation of relative abundance and dominance of species of Carabidae Forest Oak Grove Sibiu

No. Crt.	Species	Number of copies
1	*P. oblongopunctatus*	57
2	*Platynus assimilis*	43
3	*Pterostichus niger*	61
4	*P.melanarius*	43
5	*Carabus violaceus*	9
6	*Carabus ullrichi*	12
7	*Carabus gigas*	6
8	*Harpalus latus*	7
9	*Carabus coriaceus*	4
10	*Carabus monilis scheidleri*	9
11	*Carabus nemoralis*	11
12	*Agonum sp*	5
13	*Anisodactylus binotatus*	3
14	*Loricera pilicornis*	13
	Total copies	**283**

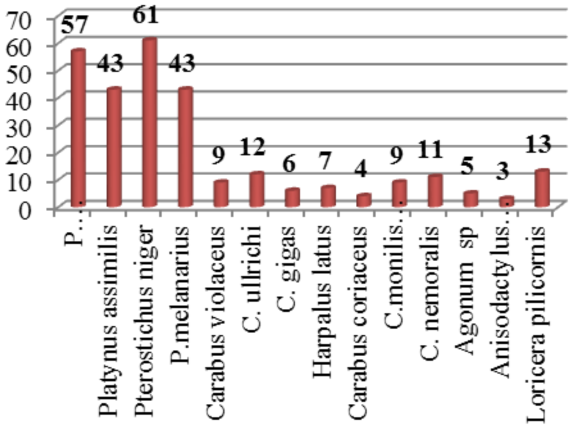

Fig. 1. The results beetle species collections in May-October 2015 conditions

Pterostichus niger

Lc = 20-21 mm (Fig.2.). **Biology**: from the lowlands to the mountains, forests, gardens, meadows. In the surroundings of Cluj [6] collected her from IV to IX frequent species also in forest of beech and oak, but it is also present in crops (potato, sugarbeet) which provide survival conditions. **Food regime**: entomofague [5].

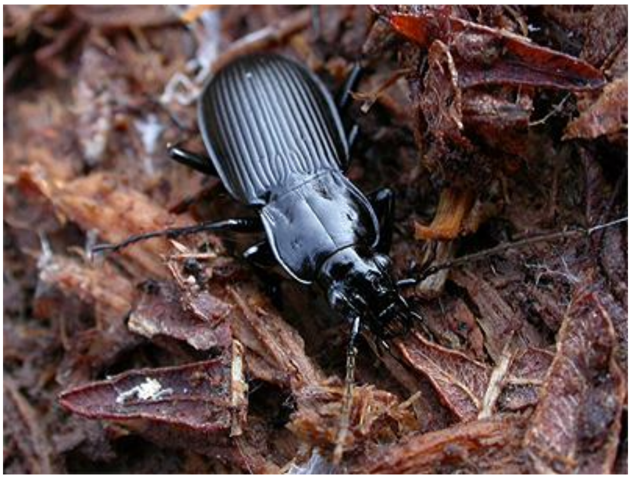

Fig. 2. *Pterostichus niger* (orig.)

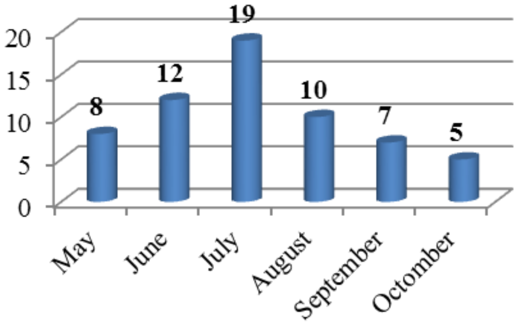

Fig. 2. Phaenological curve of *Pterostichus niger* în forest area in 2015 year

Pterostichus oblongopunctatus

Lc = 11 to 13 mm. (Fig.3.). **Biology**: straw prefer forests, it is listed as a species characteristic of beech forests present in litter [15]. **Food regime**: zoophague.

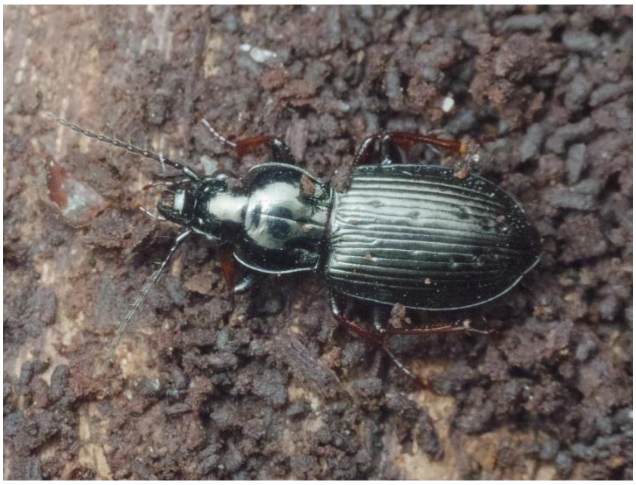

Fig.3. *Pterostichus oblongopunctatus* (orig.)

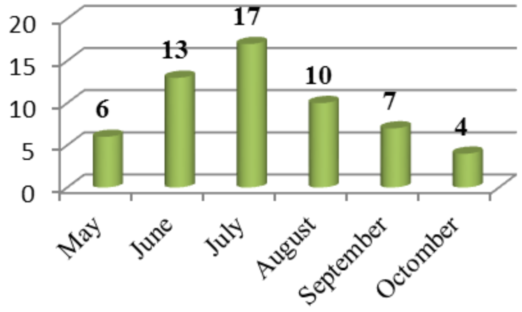

Fig.4. Phaenological curve of *Pterostichus oblongopunctatus* în forest area, in 2015 year

Platynus asimilis

Lc = 11 to 14 mm. (Fig.5.). **Biology**: prefers the more humid forests under foliage, moss, under stones, waters edge, etc. **Food regime**: predator and parasite.

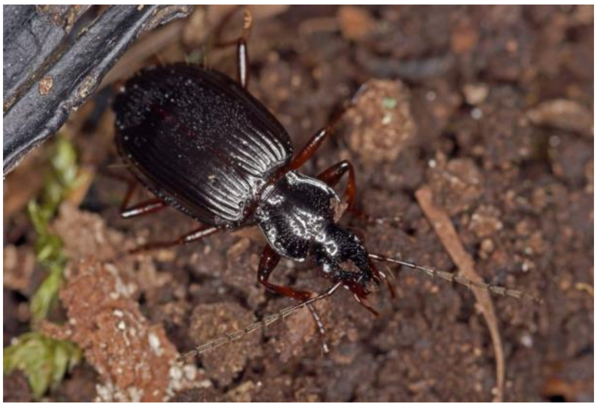

Fig. 5. *Platynus asimilis* (orig.)

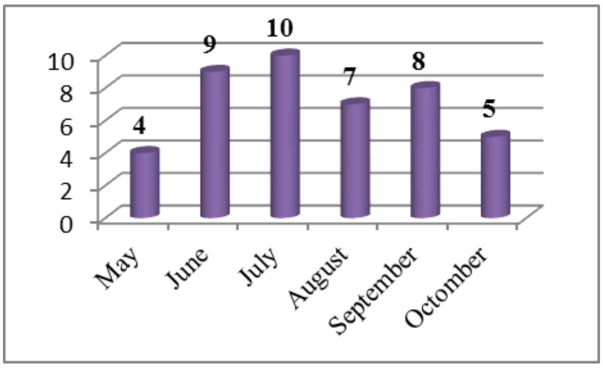

Fig. 6**.** Phaenological curve of *Platynus asimilis* în forest area, in 2015 year

Pterostichus melanarius

Lc = 15-17 mm. (Fig.7.). **Biology**: frequent species in crops especially in the field, is dominating the culture of sugar beet and potato since IV-IX. **Food regime**: carnivorous.

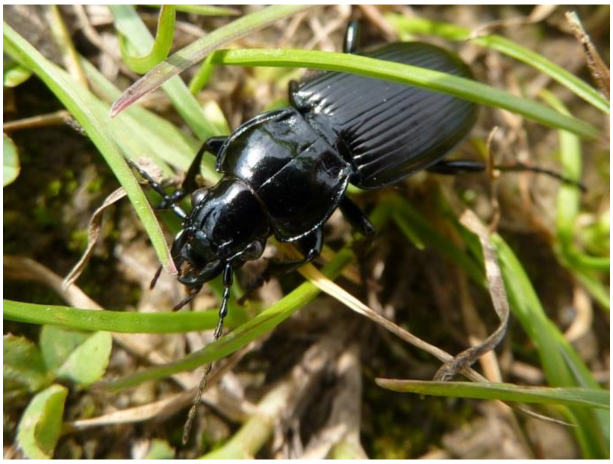

Fig. 7. *Pterostichus melanarius* (orig.)

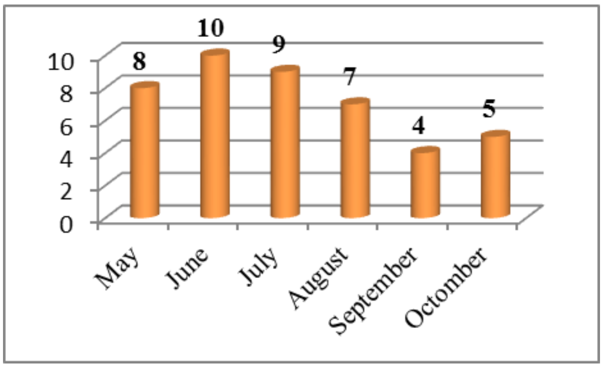

Fig. 8. Phaenological curve of *Pterostichus melanarius* în forest area, in 2015 year

CONCLUSIONS

The 14 species represented by 283 carabidae copies would have returned 5.49 m^2/insect, so a possible coverage in terms of food and protection against insects phytophase cenosis those whom lies an area of 57.72 m^2, mixophagus adding the species whose surface area (327.08 m^2) were well above their means, but their contribution as predators entomophagus added to other entomophagus can raise potential limitation phytophagus, who often do some of the insects that attack the tree crowns, root or stem, as if insects and wood decay. As a survival space it was up to each copy of the captured 4.78 m^2/insect, the surface due to competition laws vital for survival looks quite small but dividing total seizures (283) the number of days (183) note that were 1.12 specimens/day which have the total surface of 876 m^2. Of course everything in nature is closely linked to abiotic factors and relationships can be changed in one way or another[8-10, 18-22].

Several species of Carabide captured in Oak Forest Grove Sibiu inhabit the surrounding areas and crops to forest area and Poplaca and Rășinari follows with: *Carabus coriaceus, Carabus violaceus, Carabus ullrich, Pterostichus niger, P. melanarius, Harpalus sp.*, proving a promiscuous spread with a broad food spectrum.

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TAX MEASURES APPLIED ON THE AGRICULTURAL INCOME IN ROMANIA COMPARED TO THE UNITED KINGDOM

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Abstract

It is well known that farming has always been risky. The income obtained in agriculture may differ from year to year because of its dependence on the climatic and soil conditions and because of the output prices. Also, the taxation has an influence too on the income, too. Although, both Romania and the United Kingdom are member states of the European Union, the taxation varies, so, the point of this study is to show the differences between the taxes applied on annual income in agriculture in this two countries, attempting to discover recommendations for a better performance, where needed. The conclusions drawn will reveal which agricultural system is more efficient, but also the benefits for the farmers from the both countries.

Key words: *agriculture, income tax, tax relief*

INTRODUCTION

Taxes are one of the main instruments of an economic policy. Through a tax system, in some countries, a redistribution of even almost a half of their national income is being made. Ipso facto taxes have significant influence on economy. [8]

Tax systems in the EU countries have been affected by economic, social, and political processes. It should be noted that despite numerous changes those systems have been burdened with defects and still require continuous changes to their adaptation to the new economic conditions. International comparisons regarding taxes may be particularly useful on these conditions. Numerous studies show that the EU countries are characterised by very similar tax systems despite different socio-economic and political determinants. Mendoga and Tesar (2006) indicated that a high share of indirect taxes in the tax system might foster an economic growth. [10]

Taxation does more than raise government revenue. It can affect the behaviour of economic agents in ways that complement or conflict with other public policies, including those directed at agriculture. Exceptions to normal tax regimes can be used as an explicit policy instrument or may have unintended impacts.

In developing countries taxes on agriculture (particularly agricultural exports) have often provided a major source of public sector funds. Taxation has also been used to stimulate the transfer of resources from agriculture to the rest of the economy. Though there are different ways of taxing agriculture, there is evidence that taxation has reduced agricultural growth. [6]

Yearly income as basis for the taxation in the way we measure it today, is of relative recent date. The taxation of the real income depends on one or another form of record for the enterprise. The alternative and old form of taxation is the cadastral system, i.e. taxation based on a stipulated value of some selected items which in the agriculture sector can be land area, soil quality, the size and composition of the livestock etc. In some countries the tax of small private enterprises is computed as a certain percentage of the annual turnover. Some countries allow averaging the income for a fixed number of years to determine the basis for the income tax. Whereas this method is reserved the agriculture and forestry sectors in some countries it may also be available for all small enterprises. The average method can provide tax benefits if there are fluctuations in the income from one year to another and the tax system is strongly progressive. [1]

Taxation and administration records where persons that are members of agricultural households can be distinguished from those in other socio-professional groups. Problems with this source are that, in many Member States, some or all farmers are not taxed according to their personal incomes as shown in accounts but by various flat rate systems (per hectare, etc.). Operators of farms arranged as companies may escape coverage (as their directors may not have income from self-employment in agriculture). [7]

MATERIALS AND METHODS

This study is based on the statistical data from the last three years, provided by Eurostat and tax legislation in effect in Romania and the United Kingdom, but also on the information from various authors. As analysis method, it was used the comparison method. "The comparison method is the most used method in economic and financial analysis. Its main characteristic consists of the study of economic processes and phenomena through a reference criterion, establishing similarities and differences between them." [4].

RESULTS AND DISCUSSIONS

The two analyzed countries have agricultural areas in different proportions, but referring to gross value added the situation is inversely proportional to the owned surfaces. Thus, more than a half of the Romania's territory is represented by rural regions, with extended agricultural areas, compared to the United Kingdom where only a quarter of its surface is represented by it. But, for all that, the gross value added in these states is approximately the same, even though the population and the employment rate in agriculture in Romania are much lower than the U.K.'s ones. (Table 1, Table 2).

In Romania, the income tax in agriculture is due by any farmer who cultivates an area greater than the limits set by law as being exempt from the tax or by any farmer who has a greater number of livestock than the law limits. [2]

Table 1. Importance of rural areas in Romania

	Territory	**Population**	**Gross Value Added**	**Employment**
	(km^2)	**(persons)**	**(Million EUR)**	**(persons)**
Year	2013	2014	2012	2014
Predominantly rural regions (PR)	142,545	8,959,110	37,266	3,602.500
Intermediate regions (IR)	94,025	8,705,233	48,260	3,593,000
Predominantly urban regions (PU)	1,821	2,282,968	31,906	1,058,900
TOTAL	**238,391**	**19,947,311**	**117,432**	**8,254,400**

Source: Eurostat, Economic Accounts for Agriculture[11]

Table 2.Importance of rural areas in the United Kingdom

	Territory	**Population**	**Gross Value Added**	**Employment**
	(km^2)	**(persons)**	**(Million EUR)**	**(persons)**
Year	2013	2014	2012	2014
Predominantly rural regions (PR)	68,593	1,850,094	34,258	774,700
Intermediate regions (IR)	110,643	14,951,143	360,433	7,004,900
Predominantly urban regions (PU)	69,228	47,507,024	1 396,300	21,743,600
TOTAL	**248,464**	**64,308,261**	**1,790,991**	**29,523,200**

Source: Eurostat, Economic Accounts for Agriculture [11]

Under U.K. taxation laws, to qualify as a farmer, a taxpayer must satisfy two tests: he or she must be in occupation of land; and the purpose of the occupation must be, at least mainly, for husbandry – i.e. cultivating crops or breeding and rearing livestock. [5]

In Romania, a farmer owes the state an income tax of 16%, but this percent is not applied to the actual income, but to some norms established by law. The income tax will be calculated based on those norms even if the income is grater or smaller. There are also tax-free limits that varies depending on the crop culture or the livestock.

Table 3.Agricultural income in Romania vs. the United Kingdom

Values at basic prices	**2014**	**2015**	**2014**	**2015**	**2015/14**	**2015/14**	**2015/14**	**2015/14**
	Million EUR Romania		**Million EUR the U.K.**		**change % Romania**	**change% the U.K.**	**Absolute deviation Romania**	**Absolute deviation the U.K.**
Output of the agricultural "industry":	16,771	15,177	31,704	29,169	-9.50%	-8.00%	-1,594	-2,535
- Intermediate consumption	**9,672**	**8,773**	**19,665**	**18,928**	**-9.70%**	**-3.70%**	**-899**	**-737**
= Gross value added at basic prices	**7,099**	**6,444**	**12,039**	**10,241**	**-9.20%**	**-14.90%**	**-655**	**-1,798**
- Consumption of fixed capital	2,812	3,279	3,317	3,414	16.60%	2.90%	467	97
- Taxes	21	21	122	124	0.40%	1.10%	0	2
+ Subsidies	1,839	1,514	3,653	3,485	-17.70%	-4.60%	-325	-168
= Factor income*	**6,105**	**4,658**	**12,253**	**10,188**	**-23.70%**	**-16.90%**	**-1,447**	**-2,065**

Source: Eurostat, Economic Accounts for Agriculture

Because the norms of income did not fluctuated significantly in the last three years, the income tax remained at the same level (Table 3). In the United Kingdom, the tax is applied directly to the income, but phased and there is also a relief of £11,000 at the incomes up to £122,000. The income tax is calculated as in Table 4.

Table 4.Income tax rates in the United Kingdom

Personal allowance	**£ 11,000***	
Band	**Income**	**Tax rate**
Basic rate	£ 11,000 - £ 43,000	20%
Higher rate	£ 43,001 - £ 150,000	40%
Additional rate	Over £ 150,000	45%
****You do not get a Personal Allowance on taxable income over £122,000.***		

Source: www.gov.uk [12]

As it can be seen in table 4, the gross value added (GVA) in Romania had a lower decrease (-9.2%) compared to the United Kingdom (-14.9%). In terms of agricultural income, it can be observed (Table 4), that the both countries had a similar variation in the last two years. Thus, in Romania, the income obtained in 2015 decreased with 23.7% compared to the 2014's income. This fluctuation can be observed at the United Kingdom too, where there was a decrease of 16.9% in 2015 compared to 2014. In spite of that, the relative deviation of 2015 compared to 2014 in Romania had a lower value (-23.7%) than the United Kingdom's one (-16.9%). One of the main causes of this difference is represented by the influence of the subsidies on the income. (Agriculture is the last great subsidised industry. It gets several billion pounds annually from taxpayers through the European Union's common agricultural policy. For investors, it is recession-proof. Regardless of any downturn in the world economy the subsidy cheques keep rolling in. [9]) In terms of tax on income, it can be said that there is the most significant difference between these two states.

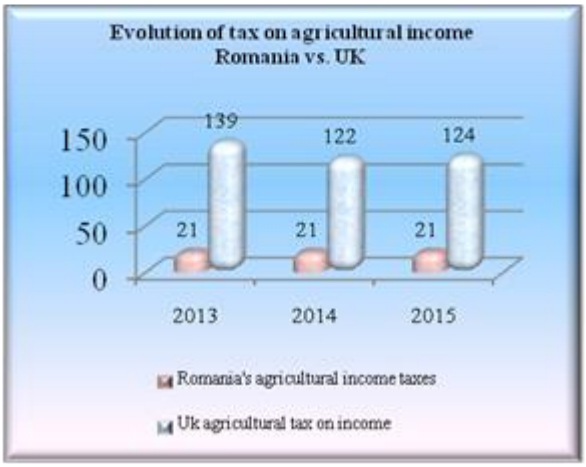

Fig.1.Evolution of tax on agricultural income Romania vs. the U.K.
Source: Own calculation

According to Fig. 1, the tax level in Romania remained almost the same in the last three years, compared to the United Kingdom, which fluctuated. This fact is due to the differences between the taxation systems from the two countries. "A feature of the U.K. is the number of farm businesses arranged as companies, usually with tax minimisation in mind, though these still represent a minority of farms." [9]

To illustrate better these differences it will be presented two calculation models of the income tax, for both states, for two vegetable farms, where wheat is grown mostly.

Example 1:

(i)A Romanian farmer making a £170,000 profit on a surface of 8,000 ha cultivated with wheat will have the tax-free limit for wheat: 2 hectares, the income norm for wheat: £28.4 (it varies depending on county) and the tax due calculation will be: (8,000 ha – 2 ha) x (16% x £28.4) = 7,998 x 4.544= £36,343 [3]

(ii)A British farmer making a £170,000 profit would lose the personal allowance; the first £43,000 would be taxed at 20%, the next £117,990 at 40% and the remaining £9,010 at 45%. Thus, the calculation would be: £43,000 x 20% = £8,600; £117,990 x 40% = £47,196; £9,010 x 45% = £4,054, so, the tax due will be = £8,600 + £47,196 + £4,054 = £59,850.

Example 2:

(a)A Romanian farmer making a £11,000 profit on a surface of 100 ha cultivated with wheat will have a tax-free limit for wheat for 2 hectares, the income norm for wheat £28,4 (it varies depending on county), thus, the tax due by the farmer will be calculated: (100 ha-2 ha) x (16% x £28,4) = 98 x 4,544 = £445,312

(b)A British farmer making a £11,000 profit would pay 0 tax income because of the personal allowance.

As it can be observed in these two examples, there are advantages and also disadvantages for both taxation systems. Even though the United Kingdom has a more complicated taxation system, the tax-free limit is more significant than the Romania's one, especially for farmers who make profits up to £11,000. So, the Romanian taxation system has advantages compared to the United Kingdom only for large profits.

In terms of tax reliefs, In Romania, in the current financial year, for the income obtained by individuals, if there is a loss due to bad weather conditions (such as: frost, hail, ice, drought and floods) that affects more than 30% of the surface intended for agricultural production, the norm of income will be reduced proportionally with the loss. In the United Kingdom, to mitigate the effects of the profit fluctuations due to bad weather, farmers' averaging was introduced, so that agricultural trades are not pushed into a higher tax bracket in one year without necessarily having adequate compensation in the following years. This method can be applied for a period of two, three, four or five years. Farmers' averaging is a calculation method, which works as it follows: a farmer A makes profits of: Year 1: £ 40,000; Year 2: £ 10,000; Year 3: £10,000; Year 4: £ 22,000; Year 5: has a loss of £ 12,000. For the year one, year two and year three there will be an averaging of (£40,000+ £10,000+ £10,000) / 3 = £ 20,000. For years two, three and four, the averaging will be: (£ 10,000+ £ 10,000+ £ 22,000) / 3 = £ 14,000, and for the years three, four and five, the averaging will be: (£ 10,000+ £ 22,000+ £ 0) / 3 = £ 10,667. In this way, if the farmer has a loss, he can 'cover' it with the previous profits.

CONCLUSIONS

The study achieved its purpose, to find the differences between these two E.U. taxation systems.

A first conclusion, based on the 2012 data, is that even if in Romania, on a territory of 142,545 km² occupied by rural areas, there are about 3,602,500 persons who are employed, the gross value added (37,266 mil EUR) is almost at the same level as the United Kingdom's one (34,258 mil EUR), which has a surface of 68,593 km² represented by rural areas where there are 774,700 employees. This means that the United Kingdom, with a rural area two times smaller than Romania's, can achieve a gross value added at the same level as Romania. This shows the fact that the United Kingdom's agricultural system is more organized, and more focused on helping the farmers, and in the end helping the country.

Thus, a second conclusion is that even if there is an income tax bigger than the one used in Romania, the annual agricultural income in U.K. is greater than Romania's. A cause that led to this situation is represented by subsidies system, which is not a strong point for Romania.

A third conclusion is related to the deviations calculated in this study, so, in Romania, there was an absolute deviation of 62 million EUR in 2014 compared to 2013 and one of -1,447 million EUR in 2015 compared to 2014. In the U.K., there was an absolute deviation of 630 million EUR in 2014 compared to 2013 and one of -2,065 million EUR in 2015 compared to 2014.

A good thing, and also a similarity between the two states is that in both countries there is a tax relief for farmers if their outputs are affected by bad weather.

Finally, is recommended for the Romanian Government to improve the subsidies system, and even the taxation system in agriculture. There should be a more specific method of calculus for the agricultural income tax.

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THE DEVELOPMENT OF BUSINESS PARTNERSHIP AS AN EFFORT TO INCREASE THE MANGO FARMER'S INCOME, A SYSTEM DYNAMIC APPROACH

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Abstract

West Java is one of the largest mango production areas in Indonesia. Yet, there is no proper policy and institution supporting West Java to have competitive advantage in national and international market. On the other side, the demand of mango is increasing in line with the improvement in the income of the society as well. The proper supporting agriculture institution is required in order to create a link between the market and the producer which, in turn, will improve the quantity, quality and continuity of the mango supply in the market and raise the mango farmers' income level. This research is focused on the mango farmer and aimed to strengthen the partnership of the supporting institution in order to involve the farmer in the modern and global market as well as develop a strategic policy to improve the competitive advantage of West Java's mango. The methods used in this qualitative research are descriptive and dynamic system analysis. The result shows that there are partnerships take place between farmers and big suppliers, farmers and exporters, as well as farmers and industries. In maintaining the sustainable partnership model, factoring policy and socialization on the use of the off-seasons technology are required to improve its productivity which, in turn, will influence the income level of the mango farmer.

Key words: *bussines partnership, farmer's mango income, dynamic system*

INTRODUCTION

In the last ten years, in Indonesia, the demand of fruits from local and international market has been growing rapidly. The increase of the demand from domestic market is caused by the raise of the society income and the improvement of the needs of good nutrition. SUSENAS data showed an increase in the consumption of fruits per capita (kg / capita) by 13% in the last 20 years. The increase is much more promising when we take a look at the increasing number of mango consumption by 20% per year, from just 0.99 kg / capita / year to 3.12 kg / capita / year in 2003. Initially, the mango as seasonal fruit is considered as a luxury fruit by the people bought by the upper classes. But now, the mango has been more available with a relatively cheaper price most of the year. Naturally when the people's income rises, the consumption of fruit also shifts from being available throughout the year like bananas to a more exotic seasonal fruit. Similarly, the export demand for tropical fruits continues to rise, including the demand for mangoes from Indonesia. Mango exports data in five years from 2007 to 2011, showed an average increase of 14% per year (Director General of Horticulture, 2012).

The major market shares of mango are in the Middle East, East Asia and Western Europe countries. In addition, in fact, there are also some countries that have the potential to be mango export target such as: China, Japan, Europe and Australia. The rapid growth of mango open market, both domestic and international, would theoretically increase the sales volume which, further, increase mango farmers' income. But the empirical data shows that mango farmers 'income has not increased as expected due to various constraints such as low mango quality, as well as limited access to market and technology information. Business partnership is considered as an effort to give farmers access into technology, capital and market information which wil raise mango farmers' income. But what happened in the field are not always in line with the theory. Therefore, an in-depth study about business partnership of mango farmers as an effort to increase farmers' income is needed.

The research problem is formulated as follow:

(i)How is the partnership pattern existed between the mango farmers and their business partner?

(ii)What kind of business partnership is needed to develop the mango farmers business in order to increase the farmers' income?

Literature review.

The Development of Business partnership (Contract Farming) Model as An Effort to Increase The Mango Farmers Income.

The weakness of agribusiness in Indonesia was identified by Saragih (1998) [13] who suggested that the agribusiness system in Indonesia was generally dispersal, horizontal and asymmetric. These three things together have weakened the competitiveness of agribusiness which make the comparative advantage is in vain, because the structure is unable to take advantage of agribusiness into competitive advantage. In such conditions farmers face productivity paradox, namely increased productivity where greater added value enjoyed by those who are in non-farm, so the level of real income of the farmers is getting left behind. The conditions explained above are also found in mango commodity. Increased demand followed by increased production and price level (consumer's price) is not always result in welfare for farmers as the profit received by farmers is not correlated with the increase in the price at the consumer level. Various studies show that the increasing demand for mango for both domestic and international market mango caused the price at consumer level continues to rise. But it turns out that the effect of price increase is not merely enjoyed by mango farmers as producers, but the traders (middlemen or traders). (Agustiana, 2005; Saptana, 2005) [1, 12].

In the study conducted by Yulizarman (1999) [22] in Indramayu-Indonesia, it was found that 73.3% of the farmers used "tebasan system" at a much lower price and only 26.7% were harvesting their own and sell them immediately to collectors. The factors that influence the farmers to choose the "tebasan system" are because farmers need funds quickly and avoid the risk of theft as the harvest itself needs labor and additional costs and, moreover, they are lack of experience in harvesting and selling the fruit. However, Sulistyowati study (2009) [16] showed that mango farmers who sell their product through the APPM (Association of Mango Farmers and Merchants), obtain a higher price and market guarantee. But, the problem is that there are only a small number of farmers who want to join the institution. From the above mentioned studies, it can be expected that the institutional mango farmers have not been functioning optimally so that the mango farmers choose to sell through slash and debt bondage. There are obstacles encountered in the development of mango farmer's commercialization, especially the influx of imported fruits from overseas. Imported fruit has several advantages over local fruit such as its high quality, attractive color, good shape and size, attractive packaging, as well as the vigorous promotion via electronic media. According Sulistyowati *et al*. (2015) [18], off-season technology adoption by Indonesia mango farmers is still low (17.92%). If compared between two biggest mango centre in Indonesia, West Java have higher implementation level than East Java, that is 23.42% compared to 12.50%. Based on the problems of the asymmetric and dispersal mango agribusiness structure, then the business partnership is one solution needing to be considered. Contract farming as a form of partnership in the agricultural sector, according to Eaton, C. and Andrew W. Shepherd (2001) [7], when efficiently organized and managed, contract farming reduces risk and uncertainty for both parties as compared to buying and selling crops on the open market. In other words, partnership is the parallel cooperation relations between businesses based on the principle of mutual benefit and mutual protection which lie on the principle of kinship and togetherness.

The immediate benefits of contract farming are; a) Improving access to capital and production factors, b) Improving access to the market, c) Utilizing better technology, d).

Better risk management e) Increasing the use of family labor. Thus, contract farming is one of the institutional engineering that unite the farmers from one production sub-system with other production sub-system in order to increase efficiency and productivity which refers to the market mechanism, and more equitable value-added distribution for all actors of agribusiness. Thus, farmers' income is expected to increase as well as their welfare. A study conducted by Sulistyowati in 2003 [15] in Cianjur and Bandung Regency found that the implementation of the partnership showed better performance in farming to farmers. The result of testing the allocative efficiency of the factors of production (land, seeds, organic fertilizers, inorganic fertilizers, pesticides, and labor) showed an evident that contract farming was more efficient than non-contract farming. So it can be concluded that the implementation of the partnership play a significant role in improving the allocative efficiency of the factors of production, income and R/C. Similarly with the Multi-partite partnership model, it has been succeed to improve the welfare of coffee farmers through improved quality of Luwak coffee, so they can reach export markets to Europe (Sulistyowati, 2010) [17].

MATERIALS AND METHODS

The research was conducted in Cirebon as the center of mango production and contract farming in West Java-Indonesia. The design of this study is qualitative, while the data and information come from primary and secondary sources. Data collected are based on observations, discussions, and in-depth interviews with respondents through and FGD to obtain numerical data and mental models. The participants are specialists associated with mango agribusiness such as District Agriculture Office, BRI and BNI as banks representatives, Agricultural Instructors, the Chairman and members of Mango Farmers Group, Chairman and members of Gapoktan, Mango dealer, mango Seed Provider, Mango Collector, Sprayer Trader (insecticide spraying and sellers), the partner (Cirebon – SAE, PD. Ece Kewer, PD. Dunia Gincu). Mental models are the rules underlying the decision making by the actors involved in the mango agribusiness system studied (Tasrif, 2005) [20].

Data Analysis

a)*Supply chain mapping* is used to describe the mango supply chain.

According to Feller, Shunk, and Callarman (2006) [8], Supply Chain is a network organization of product from upstream to downstream including all sorts of different processes and activities that provide value to the product until it reaches the consumer. Meanwhile, the Supply Chain Management (SCM) is a series of approaches to integrate suppliers, dealers and retailers efficiently so that the product is produced and distributed by the correct quantity, location and time to minimize costs and satisfy the needs of the end user (Copra, Sunil and Peter Meindl, 2001) [5].

b)*Dynamic System Analysis*. The rationale for the methodology of system dynamics is system thinking in which every issue is seen as a system including all the interactions between the elements of an object within a particular environment that works to achieve the goal. According to Sterman (2001) [14], and Bell C. *et al*. (2003) [4], system dynamics is a perspective and set of conceptual tools that helps us to understand the dynamic structure of a complex system. System dynamics is also a method of solid modeling which enables us to build a computer model to create a simulation of complex systems and use these models to design policies and also organizations more effectively. The methods of system dynamics is done through six stages, such as: Problem identification, System conceptualization, Model formulation, Simulation and validation, Policy analysis and improvement and Implementation (Sushil, 1993) [19]. The main assumption in the paradigm of dynamic systems is that the structure of the phenomenon is a collection of causal loop structure. The existence of this structure as a logical consequence of their physical constraints and social goals, reward (praise) and the pressure that causes human to acts and generate dominant dynamic cumulative tendencies holistically (Sterman, 2001) [14].

RESULTS AND DISCUSSIONS

Mango Supply Chain in Cirebon Regency. Actors involved in the mango supply chain in Cirebon regency are supporting industries which become providers of inputs (seeds, fertilizers and insecticides), Saprotan store which supply farmers' needs in conducting mango farming, Department of Agriculture, Department of Trade and Industry, banks and other financial institutions. Perpetrators of mango production centers involve farmers, middlemen, traders, farmers' groups and companies / exporters. Production of mango produced by farmers is used to meet the needs of the processing industry, the traditional markets, supermarkets and international markets (Fig. 1).

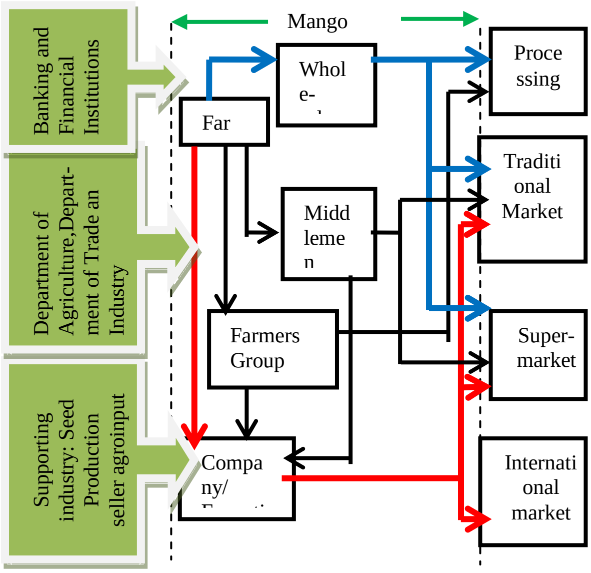

Banking and Financial Institutions
Department of Agriculture,Depart-ment of Trade an Industry
Supporting industry: Seed Production seller agroinput
Mango
Far
Whol e-
Midd leme n
Farmers Group
Compa ny/
Proce ssing
Traditi onal Market
Super-market
Internati onal market

Fig. 1. Mango Supply Chain in Cirebon Regency, Indonesia

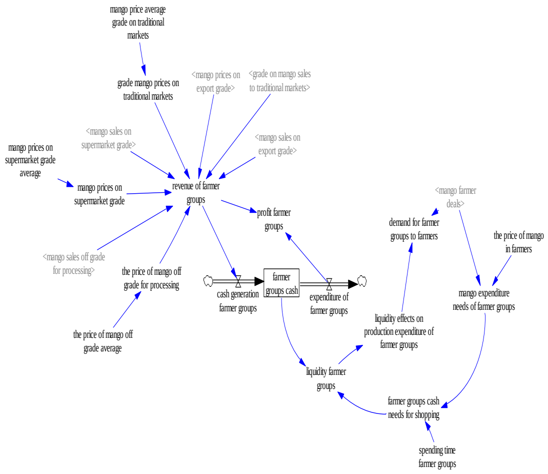
Each of the actors involved have different roles and functions in the development of mango in Cirebon. Farmers as a manufacturer is dependent upon the industry as input providers, such as saprotan store, which fulfill their mango farm inputs such as fertilizers, pesticides, growth regulators and others. As a provider of information, the Department of Agriculture through agricultural instructors are able to help farmers in the delivery of information technology in mango cultivation so as to increase the productivity of mango, control the pests and diseases as well as information needed by farmers. Banks and other financial institutions are expected to take part in providing capital for farmers farming so that farmers will no longer have difficulty in obtaining capital and get stuck with usurer or bonded labor system. Mango farmers as producers have a very important role in the development of mango but the farmer must also be supported by the industry and supporting institutions. Farmers in cooperation with the middlemen, traders, farmers' groups and exporters are able to help farmers in the mango market to meet export demand.

Mango in Cirebon is distributed to meet the processing industry such as sweets and mango purre, traditional markets, Pasar Induk (Jakarta, Bandung, Batam, Semarang and others), modern markets, such as supermarkets (Carrefour, Yogya, Sogo and others), and for the international market in the Central East countries and Singapore have a continuous demand for mangoes.

System Dynamics Approach-General Model of Actors Interaction in Mango Farming

Mango supply chain in Cirebon Regency-Indonesia is a complex network because it involves a variety of actors. These actors are consisted of mango farmers, farmer groups, middlemen, traders in traditional markets, supermarkets, and exporters. However, the mango supply chain activities seem to apply the integrated system involving the relationship of the various actors involved in the supply chain activities. There are some activities in mango farming activities to meet market demand. The results from the production of mango farmers are transported and stored in advance by the middlemen and farmer groups so that there will be sorting activity based on its quality to distinguish the quality of the mangoes that will be distributed to the markets respectively.

a)Sub Model of Mango Supply in Farmer Group and Market. In this model (Fig. 2), it is also explained that the sorting activities undertaken by the mango farmer groups that determine their group of quality (grade) into on grade distributed for SAE market partners as much as 90% of the total production and the remaining 10% off grade is distributed for processing. The SAE partners also conduct the sorting for different market segments, namely 50% for the traditional market, 20% for supermarkets, and 30% for export. This condition in the sub model happens to mango farmers in Cirebon.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liquidity effects on production expenditure of farmer groups
the price of mango off grade average
liquidity farmer groups
farmer groups cash needs for shopping
spending time farmer groups

Fig.2. Sub Model Diagram Mango Supply in Farmers Group and Market

b)Farmers group financial Sub Model. Mango farmer groups financial can be seen from the profit obtained by farmer groups and also expenditure on costs incurred from the transport to the sorting process as well as distribution to the market.

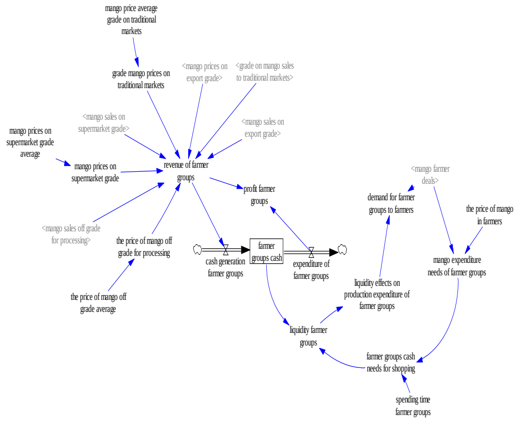
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Fig. 3. Sub-model of Financial Diagram Mango Farmers Groups

c)Wholesaller and Farmer Groups Behavior. In general, the production system of mangoes, starting from the production to the marketing stage, had not been able to provide optimal incentives to mango farmers who had been working on it (Anugerah, 2009) [2]. From some studies on mango commodities conducted by Agustiana *et al*, (2005) [1]; Saptana *et al*, (2005) [12]; Iswariyadi *et al*, (1993) [11]; Haeruman *et al*, (2001) [10]; Department of Agriculture Jabar (2001) [6] and the results of other related studies, it was found that the profits of mango agribusiness activities are mostly only enjoyed by merchant level or marketing level in general.

The results showed that the mango farmers cash in Majalengka is still low. In this case, it is shown in the dealer cash who also become mango farmers in Majalengka because they have no partner in the marketing and the mango farming in Majalengka has not been developed intensively yet although the land and the number of tree population continues to grow.

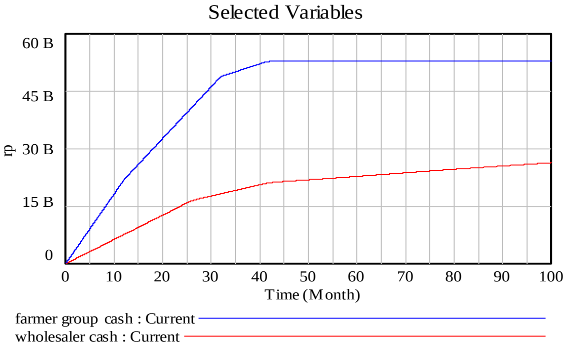
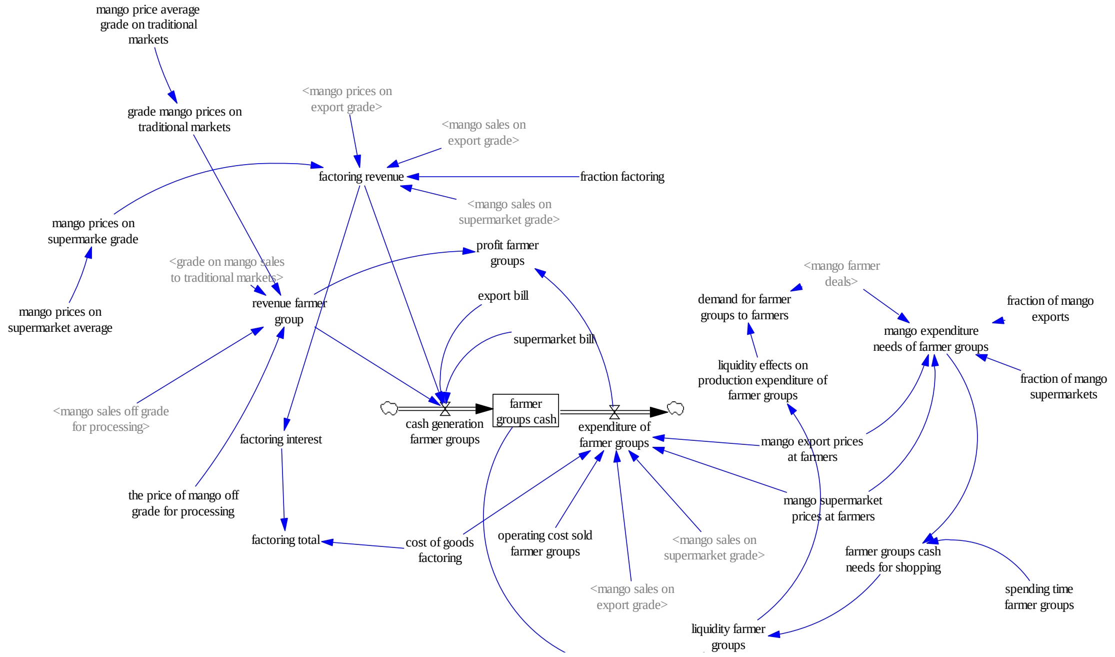


Fig. 4. Wholesallers-cash and Farmers-Group Cash Behavior

Results of the analysis showed that the farmer-group cash in Cirebon is higher than the farmer-groups cash in Majalengka as shown in Figure 4. The farmers do not have the initial capital for implementing mango farming. But, by the presence of partnerships, the cash is increasing because the farmer get capital loan from the partners and they also conduct better farming because of the demand from the partner mainly for the export market destination.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cost of goods factoring
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spending time farmer groups
liquidity farmer groups

Fig. 5. Sub model of farmer group cash scenario factoring

However, the dealer cash is low because the implementation of mango farming is still not optimal and the partnership has not been established which cause the market access still low. On the contrary, in Cirebon, partnerships have already been established managed by farmer groups that partner with CV Sumber Buah (SAE).

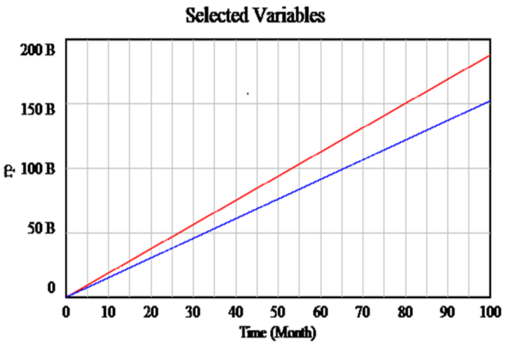
With the establishment of the partnership, the marketing access both for local and export marketing is getting better, productivity and income had also been improved as well as the business risks could be reduced (Department of Agriculture, 2001) [6]. However, in actual partnership that exists for more than six years, there are still obstacles faced by both the partner company or a group of farmers or farmer partners.

Common obstacles faced in partnership are quantity, quality, and continuity. Similarly, it is happened to the mango farmers in Cirebon. Farmers have not been able to meet the request of the partners in terms of quantity and quality so that the continuity of distribution from farmers to the partner company is not as expected. In addition, farmers felt that the payment delay of approximately one month from partner companies is less motivating.

d)Policy Recommendation for Partnership Development through Financial Institutions Factoring.

Partnerships at the mango development effort still many obstacles, one of which is their relatively long delay payment of the partners which are companies supermarket and export to mango farmers through farmer groups.

This will disrupt the liquidity of farmers in mango farming, it would be necessary policies in overcoming the liquidity constraints of farmers through cooperatives, financial institutions Bank and Non-Bank. Related to this, are supposed to use the services of financial institutions factoring or factoring. Factoring is a business entity conducting activities and financing in the form of purchase or transfer and maintenance of accounts or short-term bills of an enterprise from transactions in the country or abroad. In



Farmer group cash : 🟥
Farmer group cash scenario : 🟦

Fig. 6. Mango farmer group cash scenario factoring

Figure 6 seen their sub farmer group cash models with the addition of a new structure of factoring.

Based on modeling and simulation results obtained information that the scenario factoring, cash farmers who in turn have an impact on cash mango farmers have a tendency to rise to a higher trend compared with the farmer group cash before their scenario factoring. This will have a positive impact in increasing profits mango farmers (Fig. 6). The results are consistent with the results of research Andayani (2015) [3] which explains that factoring has a positive impact on improving cash red chilli farmers.

e)The Development of Sustainable Mango Partnership. By looking at the problems faced by the partnership between farmers and mango with a partner company (middlemen, exporters and processors), and after descriptive analysis, theory of drama and system Dynamics analysis, it is suggested that Sustainable Mango Partnership Model needs to be implemented as shown in Fig. 7.

In the field interviews and analysis conducted, the problems that stand in mango partnership are:

a) for partner companies: the production of mango farmers which do not meet both quantity and quality standards required;

b)for mango farmers: their pay delay which disturb the liquidity of farmers, especially for next mango cultivation. In developing a sustainable partnership model, the off-seasons technological innovation and institutional innovation may provide solutions to these problems.

Off-seasons technological innovation have actually been introduced to the mango farmers, but in practice there are many obstacles where many farmers are wrong in doing technology off-seasons. Therefore, skills are needed to apply the off-seasons technology well, so that the technology can increase the production of farmers, and maintain continuity of production throughout the year as well as increasing farmers' income, as prices in the summer off-season is higher. To that end, the Department of Agriculture needs to provide a more education for off-season technology, even with the field practice training (such as Piloting project garden).

Implementation of the off-seasons technology also requires higher production costs for the purchase of production facilities, approximately twice the cost of on-seasons.

It is necessary for financial institutions to provide loans to mango farmers, certainly with an affordable interest rate and repayment period adjusted to the time of mangoes harvest season.

Institutional innovation suggested in a Sustainable Partnership Model is the inclusion of the Institute for Factoring.

The problem of the relatively long delay payment of the partners, supermarket and exporter, to mango farmers through farmer groups causes losses to farmers.

This will disrupt the liquidity of farmers in mango farming. Factoring is a business entity conducting financing in the form of purchase or transfer and maintenance of accounts or short-term bills of an enterprise from transactions in the country or abroad. Therefore, with the transfer of receivables from partner to factoring institutions, the payments to farmers can be done in a shorter period of time, so it does not impede mango farmers capital for the next cultivation(results of the analysis show that the trend of farmers cash increase).

With technological innovation and institutional innovation explained above, the farmers' production processes will run continuously, production will be increased both the quantity and quality, as well as payments to farmers will run smoothly.

Thus, the Partnership can run continuously. This is in accordance with Hayami & Ruttan (1985) [9], which states that in addition to the resources and culture, the institutional and technology are crucial to transform traditional agriculture into modern agriculture.

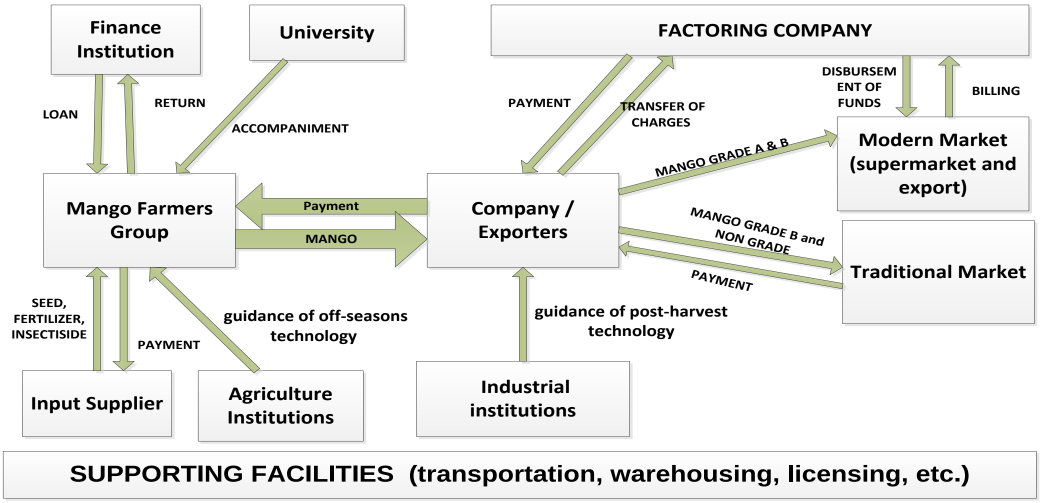

Finance Institution
University
FACTORING COMPANY
LOAN
RETURN
ACCOMPANIMENT
PAYMENT
TRANSFER OF CHARGES
DISBURSEMENT OF FUNDS
BILLING
Modern Market (supermarket and export)
MANGO GRADE A & B
Mango Farmers Group
Payment
MANGO
Company / Exporters
MANGO GRADE B and NON GRADE
PAYMENT
Traditional Market
SEED, FERTILIZER, INSECTISIDE
PAYMENT
guidance of off-seasons technology
guidance of post-harvest technology
Input Supplier
Agriculture Institutions
Industrial institutions
SUPPORTING FACILITIES (transportation, warehousing, licensing, etc.)

Fig. 7. A Model of Sustainable Partnership Mango

Supporting facilities such as road conditions, transportation vehicle, warehousing and export licensing, which is still not provided, are necessary and the government has responsibility to develop those aspects so it will be conducive to the development of mango agribusiness.

CONCLUSIONS

Business partnership in mango agribusiness are: a)Mango Farmer with Whole sellers for traditional market; b)Mango Farmer with Whole sellers for modern market; c)Mango Farmer with Exporter; d)Mango Farmer with Processing Industry.

As an effort to develop the institution innovation in the partnership of mango agribusiness in Cirebon Regency-Indonesia, It has been formulated mango sustainable partnership model, in addition to entering the socialization policy in the use of technology off-seasons, it is also necessary policy factoring, so that the partnership can increase the production of mango farmers, which in turn have an impact on farmers' income increase mango. This resulted in an increase in earnings and business efficiency mango farmers, so that the partnership can take place sustainable.

Based on the conclusions mentioned above, a few recommendations are specified below:

-Institutional financing (banks) are expected to provide loan schemes / credit adjusted with mango production patterns, and with an affordable interest rate.

-Sustainable Mango Partnership Model need to be socialized, so that the implementation can run smoothly and continuously, to increase the income of farmers and agribusiness.

-Assistance for the implementation of the Sustainable Mango Partnership Model both from the government (Department of Agriculture and Department of Industry) or from the College through LPPM is needed. Thus, it will eliminate any fraudulent acts (one-achievement) of one of the parties that will harm the other party. So that a partnership could run with a sustainable condition and mutually beneficial.

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PRINCIPLES OF A DEEP REFORM OF EDUCATION, AS SUGGESTED BY INTERVIEWING STUDENTS IN AGRICULTURE AND LIFE SCIENCES

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Abstract

The goal of this paper is to outline the draft of the General plan of social optimization through deep reform of education at all levels, obtained through interviewing life sciences first year students. It is well-known that no authentic social change could be made without a deep reform of education, starting from early age and continuing throughout the life span. Implementing such reforms will allow durable solving of urging social problems like violence, injustice, poverty, corruption, poor financing. Interviewing agricultural management students led us to a new perspective of education, resulting from the new directions of contemporary and future society. The ideas resulted from discussions outlined a plan of educational reform for the global society. This plan is designed within a intercultural perspective, being inspired both by the great ethical systems of humanity, and psycho-socio-educational research. Applying the plan at a regional, European, and international level will be able to further humankind on the way of a life whose quality will answer both the scientific demands of a society of knowledge, and the spiritual needs of humans.

Key words: *education, ethics, globalization, reform, spirituality*

INTRODUCTION

It is well-known that no authentic social change could be made without a deep reform of education, starting from early age and continuing throughout the life span. Implementing such reforms will allow durable solving of urging social problems like violence, injustice, poverty, corruption, poor financing, based on a global ethic [4].

The goal of this paper is to shortly present the draft of a general plan of social optimization through deep reform of education at all levels, resulted from discussions with first year life sciences students at the University of Agronomic Sciences and Veterinary Medicine in Bucharest.

MATERIALS AND METHODS

In order to outline the main ideas of a plan for deep educational reform, we used a non-structured interview on the topic of how education of the future should look like. The subjects were 323 students, (221 females and 102 males) from the University of Agronomic Sciences and Veterinary Medicine in Bucharest. Discussions with students were recorded, and data were organized according to the principles of qualitative research. The discussions took place over the course of three university years, during the period 2012-2015. The material of the discussions with students was processed by the author, resulting in a literary work called *Teachings on Being: The Holy Book of Religious Leaders, Followers, and Non-Believers* [6], which earned positive reviews from several publications in the United States [1][2][3][5]. The book was conceived in the spirit of the great collective creations of humanity, like the Bible, the Iliad, or the Hippocratic Corpus, trying to embody the changing spirit of an age of change.

RESULTS AND DISCUSSIONS

The qualitative analysis of the recorded answers of the students allowed us to extract nine main principles of deep educational reform, and a quantitative analysis showed that they had different percents of popularity among students (Figure 1).

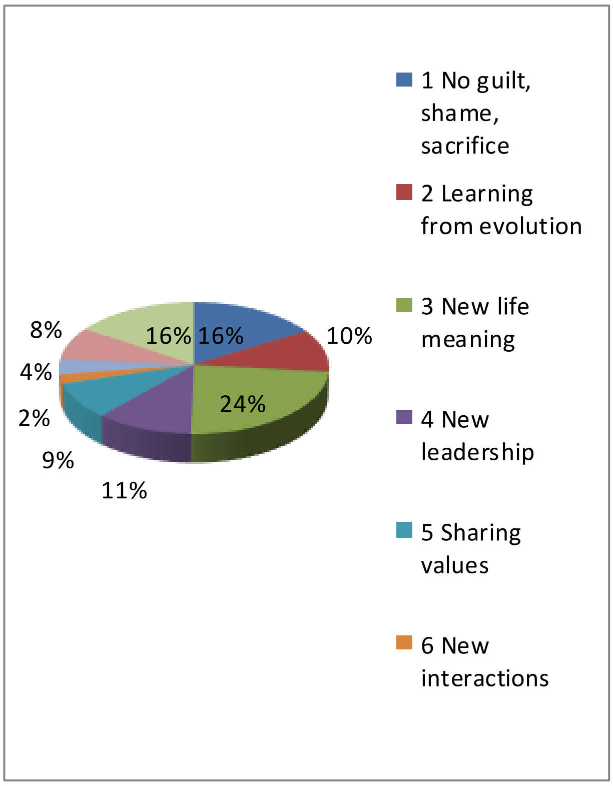

Fig. 1. Percents of popularity of reforms among students

1.An education without guilt, shame, and sacrifice (16%)

Guilt, shame, and sacrifice should not be "taught" in school, family, and society. The notions and the feelings of **guilt** and **shame** are seen as dangerous by the students, and their cultivation should be abandoned, as they legitimate and perpetuate violence, failure, and resentment. **Guilt** is misleading and useless: it is often felt by "good people" who have no reason to feel guilty, and can lead to self-punishment and even to suicide, whereas people who usually transgress norms, rarely feel guilty. **Shame** enslaves people to the opinion of others. Justice and ethics should be voided of emotion and resentment: the ideas of **crime and punishment / sin and atonement** should be replaced with the concepts of **fault and correction**.

Sacrifice and self-sacrifice perpetuate violence within society. The cult of heroes and self-sacrifice is not encouraged. Nothing deserves people's sacrifice. Sacrifice is never needed. Where there are will and reason, there is no sacrifice. Martyrs are victims, and they should not necessarily serve as role models. Sacrifice is frustration (see 'sacrificed generations'), and always implies an expected reward (e.g. paradise promised to those who die in combat, or 'I sacrificed myself for you, and that's what I get in return!'). To do something one loves, or to do something for someone dear must not be viewed as sacrifice, but prioritizing.

2.Learning from evolution (10%)

Culture and consciousness do not necessarily make people superior to other animals. **Culture is not a perfection of nature**, and **when culture deliberately goes against nature, it is inferior to it**. People should modestly see themselves not as the most complex and evolved animals, but as **the youngest brothers of all living beings**.

When they **cannot behave humanely**, people **do behave more destructively than animals**. Specifically human shortcomings, such as social passivity, apathy, lack of involvement and solidarity, greed, vanity, arrogance, cowardice, dishonesty, all originate in **fear** of losing what some people do not really possess: **a true sense of their value** as humans. People's value does not lie in their social statuses, but in what they can actually do. People should give up living isolated in an imaginary world with artificial values (e.g., status), where they feel important and superior, and **start living in the real world**, where their **true value** lies.

Evolution shows that **increased complexity** and differentiation are generally attained at the price of **reducing the lifespan** of organisms. Simple organisms are less functional, but virtually immortal. Sexual reproduction is a form of **biological altruism**, that can help complex organisms multiply, but also brings them **mortality**. Human consciousness is a very complex phenomenon, and cannot be very long-lived. People are the only beings that know they will die, but that does not give them the right to not let others live. People should not be addicted to consciousness and obsessed with immortality; although consciousness may be addictive, it need not be eternal in the traditional sense. Throughout history, people have generally accepted their biological mortality, and decided to get along and be altruistic enough to share with descendants the gift of life.

The deeper understanding of **afterlife** is that it is, in fact, **this life complete**. The notions of hereafter or the world to come do not refer to other worlds, but to this world, seen from outside time and space. Thus, people should concentrate on living a full and good life, not awaiting punishment or reward from the outside. The end of life is not destruction, but completion. To simply be is more important than to always be conscious and aware. Because the world is a whole, people cannot really and completely separate from life and from the ones they love.

3.Understanding the true meaning of life (24%)

People do not need salvation from an external danger, but from **a wrong take on their own life**. The real danger is an "ethics of catastrophe". Life does not necessarily mean suffering or trying to liberate oneself from suffering. To search for happiness means to be an unhappy person. The need for an "eternally happy life" may in fact indicate a deep discontent with life. Life is more than seeking reward and avoiding punishment. **Life should be lived primarily for its own sake**.

4.A new approach of leadership (11%)

Leadership is provided by myths and institutions, and not by flesh and bone people. The legend is always greater than the man or the woman. **The power of leadership is in the minds of the governed, and not in the hands of the leaders**. Sometimes, the desire to lead is not a desire to help others, but a desire to dominate and to feel important by achieving status, in people lacking the sense of their intrinsic value. Everybody should do their work with modesty, **without trying to exercise power on others**.

5.Sharing of values within society (9%)

Traditional age- and gender-specific values should be cultivated and shared within society. Children's values of honesty, curiosity, and attachment, as well as traditional feminine values of caution and tolerance should be promoted in society, as they contribute to a more creative, kind, and secure world. Personal and family relationships should prevail over patriotism ("women would never send their children to die in war"). Also, the **exchange of values** between people is encouraged (e.g., men sharing feminine values, and women sharing masculine values). A world where men share traditionally feminine values is described as being more peaceful, and one were women share traditionally masculine values as more powerful.

6.Changing human interaction (2%)

People are **too centered on appearance**, and too keen on making **evaluations**. As soon as they see or meet other people, they tend to **classify** them as appealing or disgusting, beautiful or ugly, rich or poor, healthy or sick, and ultimately, **good or bad**. People should learn to treat themselves and others not with admiration, contempt, or pity, but with the **respect** owed to every human being.

7.Changing the views on tradition (4%)

Tradition should not be seen as opposing the progress of society. Views on tradition and religion, though different, as they pertain to different cultural and linguistic contexts, are generally complementary. Sometimes, to be "politically correct" means to be humanly wrong, as when someone is ashamed of their traditions thinking they may offend others. **To cultivate one's difference is not isolation, and to acknowledge the difference in others is not discrimination**. Everybody's symbols and traditions should be cultivated and may be proudly displayed in public, as long as they are common sense.

8.A new understanding of diversity (8%)

Diversity is viewed not only as a characteristic of society, but also of the individual. The diversity within every person reflects the diversity of humankind. **Everybody is in everyone, so all can be as one**: though different from each other, all people can and should **understand others** and get along with each other, because **each person has in them a bit of everyone else's character**.

9.A new ethics (16%)

An ethics that **highly values both the individual and the world** was proposed following discussions: the best way to behave involves feeling responsible for the whole world, and for every person with whom one relates. Every person should behave as responsibly as if they were world leaders that could influence the fate of humankind, and should treat each and everyone as if they were the only other - the person without whom they would be the only living human. Any person, whatever simple they may be, could influence the whole world for better or worse, just like a world leader. For example, a rescuer in a disaster, or a terrorist attacker do influence, via mass media, the state of the whole world.

From an early age, children must do the exercises of imagining themselves influencing the state of the world, in order to understand how powerful, important, and hence, responsible they will be as adults, and of imagining what would happen if they were the only living human, in order to realize that any person with whom one relates, even the worse, is better than no person at all.

CONCLUSIONS

Interviewing life sciences students led us to a new perspective of education, resulting from the new directions of contemporary and future society.

The ideas resulted from discussions outlined a plan of educational reform for the global society. This plan is designed within an intercultural perspective, being in accord both with the great ethical systems of humanity, and with psycho-socio-educational research.

Applying the plan at a regional, European, and international level will require radical change of education from early age to adulthood, and will be able to further humankind on the way of a life whose quality will answer both the scientific demands of a society of knowledge, and the spiritual needs of humans.

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ANALYSIS OF POVERTY LEVEL AMONG SOME SELECTED HOUSEHOLDS IN GIREI LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

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Abstract

Reducing poverty has remained foremost among Nigeria's developmental challenges. This study analysed poverty level among some selected households in Girei Local Government Area of Adamawa State, Nigeria. The specific objectives of the study were to; describe the socio-economic characteristics of respondents, determine the pattern of income distribution among the respondents, determine the incidence, depth and severity of poverty among the respondents, and lastly, identify the respondents' coping strategy to poverty in the study area. A multistage sampling technique was used to collect primary data from 80 household heads using structured questionnaire. Data collected were analysed using descriptive statistics, the Foster, Greer, and Thorbecke (FGT) weighted poverty index, and Lorenz curve. The result revealed that majority of the respondents were male (90%), educated (70%), married (88.57%) and whose primary occupation is mostly farming (50%). Income distribution as shown by the Lorenz curve revealed that, 79% of the respondents cumulatively earn only 56% of the income, indicating an incidence of income inequality. Poverty incidence among the respondents is 60%, having a poverty gap of 27% and a poverty severity of 10%. In response to the challenge of poverty, majority of the respondents adopt agricultural intensification and livelihood diversification (especially in non-farm activities) as coping strategies. The study recommends timely and affordable provision of farm inputs, provision of social amenities and encouraging entrepreneurial skills through training in the area.

Key words**:** analysis, households, Girei, Nigeria, poverty

INTRODUCTION

Poverty is prevalent in large parts of the world and is one of the leading challenges of mankind in the 21st century [1]. It is the more reason why eradication of extreme poverty and hunger by 2015 was placed foremost among the UN Millennium Development Goals (MDGs). Poverty is hard to define and as such, many different meanings and definitions are resorted to in the development field. [9] argued that, in order to define poverty, there ought to be a minimum standard that should be applied to all societies below which individuals can be said to be in poverty. [19] defined poverty as a lack of command over the basic needs of the people. Similarly, [11] further considered poverty as the inability to attain a minimal standard of living, measured in terms of basic consumption needs or the income required to satisfy them. Poverty has many trappings, among which are malnutrition, illiteracy, low life expectancy, insecurity, powerlessness and low self-esteem [7].

In Nigeria, the problem of poverty has for a fairly long time been a cause of concern to the government [14]. Considering poverty as a multifarious and dynamic phenomenon, Nigerian government's efforts at combating the menace in all its ramifications could be dated back to the 1960s, immediately after the attainment of independence [18, 16]. The government and other international organisations were able to formulate a number of policies and initiated some programmes and projects aimed at eradicating poverty in the country. Some of these past initiatives includes; Operation Feed the Nation (OFN), River Basin Development Authorities (RBDA), Agricultural Development Programmes (ADP), Universal Primary Education (UPE), Agricultural Credit

Guarantee Scheme (ACGS), the Directorate of Food, Roads and Rural Infrastructure (DIFRRI). Recent effort in that regard includes; Millennium Development Goals (MDGs), National Poverty Eradication Programme (NAPEP), the National Economic Empowerment and Development Strategy (NEEDS), the National Fadama Development Project (NFDP), Local Empowerment and Environmental Management Project (LEEMP) now Community and Social Development Project (CSDP).

Despite the proliferation of cross-institutional collaboration to reduce poverty in the country, millions of Nigerians are still poor [8]. In fact, [4], described the problem as deep, widespread and multidimensional with varying degrees. However, available statistics reveals that poverty is more pronounced in North-eastern part of the country. For instance, Adamawa state has about 74.2% of its citizens below the poverty line of $1.25 per day [12]. [10] emphasized the need to consider material dimensions of poverty expressed in monetary values. [15] holds similar opinion, and considers the income dimension as the core of most poverty-related problems. He assert that, poverty may stem from changes in average income or changes in the distributed income. Hence, equitable distribution of income would increase the probability of the poor having access to basic needs such as food, clothing, housing, health, education among others. Whilst most poverty studies in the State considers the major towns of the State [17, 6], this very study specifically considered poverty and income distribution among households in Girei Local Government Area of the State. A household in the context of this very study is defined in line with that of the United Nations Department of Economic and Social Affairs (2008). According to them, a household is a group of two or more persons living together, who make common provision for food and other essentials for living. The persons in the group may pool their resources and may have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated.This current study intends to achieve the following objectives;

(i)describe the socio-economic characteristics of the respondents,

(ii)determine the pattern of income distribution among the respondents,

(iii)determine the incidence, depth and severity of poverty among the respondents, and

(iv)identify the respondents’ coping strategy to poverty in the study area.

MATERIALS AND METHODS

The study was conducted in Girei Local Government Area of Adamawa State. The study area lies between Latitude 9^0 11$^{'}$ -9^0 39’North and longitude 12^0 21$^{'}$ -12^0 49’ East of the Greenwich Meridian [2]. The area falls within the Northern Guinea Savannah Zone and has a tropical wet and dry climate. Dry season lasts for a minimum of five months (November-March) while the wet season spans April to October. Mean annual rainfall is about 700mm [3]. Song Local Government Area bound the Study area to the North, Fufore to the East and Yola North and Demsa to the South and West respectively. The area has a land mass of about 2,186 square kilometres. The total population is 129,995 and predominantly agrarian [13].

Multi-stage sampling technique was used in selecting the representative households used for the study. The first stage involves random sampling of four (4) wards out of the ten wards from the Local Government Area. In the second stage, 100 households were randomly selected from the four selected wards proportionate to their size. However, out of the 100 households served with questionnaires, eighty questionnaires were correctly filled and returned, hence were used for the analysis.

Descriptive statistics (involving the use of frequencies and means) was used to describe the socio-economic characteristics of the respondents, and also identify their poverty coping strategies. The Foster, Greer, and Thorbecke (FGT) weighted poverty index was used for the poverty analysis. Several researchers [17, 5] have used this approach to measure of poverty. The FGT index is given by the formula:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left[\frac{Z-Yi}{Z}\right]\alpha$$

Where; Z is the poverty line, (the poverty line adopted for the study was \$1.25 per day or ₦206.25 per day which was the Central Bank of Nigeria's official exchange rate as at April, 2014), Yi is the per capita expenditure in increasing order for all households; q is the number of poor people in the population of size N, and α is the poverty aversion parameter that takes values of zero, one or two. when α=0, Pα measures the proportion of people in the population whose per capita expenditure on food and non-food items fall below the poverty line (poverty incidence). When α=1, Pα measures the depth of poverty -how deep below the poverty line is the averagely poor (poverty gap). When α=2, Pα measures how farther the core poor are from the poverty line compared to the averagely poor (the severity of poverty). To measure the degree of income distribution, Lorenz curve was used. The Lorenz Curve shows the distribution of total income in relation to the total population. On the curve, the horizontal (X) axis shows the cumulative proportion of households while the vertical (Y) axis depicts the cumulative proportion of monthly income of the respondents.

RESULTS AND DISCUSSIONS

Respondent's Socio-economic Characteristics

Table 1 presents the socio-economic characteristics of the respondents. The respondents were mostly (70%) male, who mostly (89%) were within their economically active age (less than 60 years).

Majority of the respondents were married (83.75%), mostly educated (77.5%) with large household size of more than five people (about 84%).

With respect to primary occupation, majority (50%) of the respondents were farmers.

With respect to the monthly income, majority (63.75%) of them earn not more than ₦40,000.

Table 1. Socio-economic Characteristics of the Respondents (N=80)

Variable	Frequency	Percentage
Age (Years)		
20 – 29	06	7.50
30 – 39	21	26.25
40 – 49	31	38.75
50 – 59	13	16.25
≥60	09	11.25
Sex		
Male	56	70.00
Female	24	30.00
Marital Status		
Married	67	83.75
Single	07	8.75
Widowed/Divorced	06	7.50
Household size		
1 – 5	13	16.25
6 – 10	45	56.25
11 -15	18	22.50
16-20	4	5.00
Primary Occupation		
Farming	40	50.00
Trading	12	15.00
Civil Servant	21	26.25
Fishing/Artisans	7	8.75
Educational Attainment		
No-formal Education	18	22.50
Primary School	23	28.75
Senior Secondary School	28	35.00
Tertiary	11	13.75
Total	**80**	**100**

Source: Field survey, 2014

Analysis of Household Income and Expenditure

The respondents' monthly income is presented on Table 2.

Table 2. Distribution of Respondents by Household Monthly Income

Monthly Income (₦)	Frequency	Percentage (%)
≤ 20,000	20	25.00
20,001-40,000	31	38.75
40,001-60,000	13	16.25
60,001-80,000	10	12.50
80,001-100,000	06	7.50
Total	80	100

Source*:* Field survey, 2014

This shows an incidence of low income generation among the respondents. Similarly, the respondents' monthly consumption expenditure is shown on Table 3. The Table indicates that, majority (86%) of the respondents' monthly consumption expenditure is not more than ₦30,000. This also reflects the low financial status of the respondents.

Table 3. Distribution of Respondents by Household Monthly Consumption Expenditure

Monthly Expenditure (₦)	Frequency	Percentage (%)
≤ 10,000	27	33.75
10,001-20,000	33	41.25
20,001-30,000	09	11.25
30,001-40,000	07	8.75
40,001-50,000	04	5.00
Total	80	100

Source: Field survey, 2014

Analysis of Household Income Distribution among the Respondents

The essence of this analysis is to show the level of equality or otherwise in the distribution of income among the respondents. Cumulative monthly income of the respondents and their population (Table 4) were related using the Lorenz curve. From the curve, it can be seen that, 79% of the respondents earn only 56% of income while the remaining 44% of the income is held by only 21% of the respondents. Strikingly, 30% of the income is in the hands of people in the highest income bracket, representing just 8% of the respondents. This shows clear indication of income inequality in the area.

Table 4. Cumulative Proportion of Respondents' Population and Income

Monthly Income (₦)	Population	Proportion of Population	Cumulative Population	Volume of Income (₦)	Income Proportion	Cumulative Income
≤ 20,000	20	0.25	0.25	368,000	0.14	0.14
20,001-40,000	31	0.38	0.63	723,000	0.28	0.42
40,001-60,000	13	0.16	0.79	331,000	0.13	0.55
60,001-80,000	10	0.13	0.92	360,000	0.14	0.69
80,001-100,000	6	0.08	1.00	757,000	0.31	1.00
Total	80	1.00		2,539,000	1.00	

Source: Field survey, 2014

Household Poverty Analysis

Based on the established poverty line, households were classified into either non-poor or poor. Figure 1 shows the incidence, depth and severity of poverty in the area. Poverty incidence (P_o) or head count is the proportion of households whose per capita monthly consumption expenditure falls below the established poverty line. The result of the analysis indicated that, 60% of the respondents were poor.

This confirms the findings of [12] who reported high incidence of poverty in the State. Poverty depth (P_1) measures the mean distance between the expenditure (or income) of the average poor and the poverty line. The result of this study shows a poverty gap of 0.27 (27%).

This implies that the expenditure of the poor has to increase by 33% for them to reach the poverty line level. Similarly, Poverty Severity (P_2) consider the distance that separates the poor from the poverty line, that is the poverty gap and it also reveals the inequality among the poor.

The findings of the analysis of shows a poverty severity of 10% (or 0.10). This implies that 10% of the respondents live very far below the poverty line.

Analysis of Household Poverty Coping Strategies

In response to the challenge pose by poverty, the respondents adopt range of strategies to increase their stream of income. Cultivation of several crops/expansion of farmlands (Agricultural intensification) is ranked top most (57.5%), livestock keeping (about 39%) is second, and then trading (26%).

Therefore, the key strategies being adopted by the respondents can broadly be considered as agricultural intensification and livelihood diversification (especially by adding non-farm activities) as can be seen on Table 5. Migration as a consequence of poverty is less likely as only 1% of the respondents considered that a coping strategy.

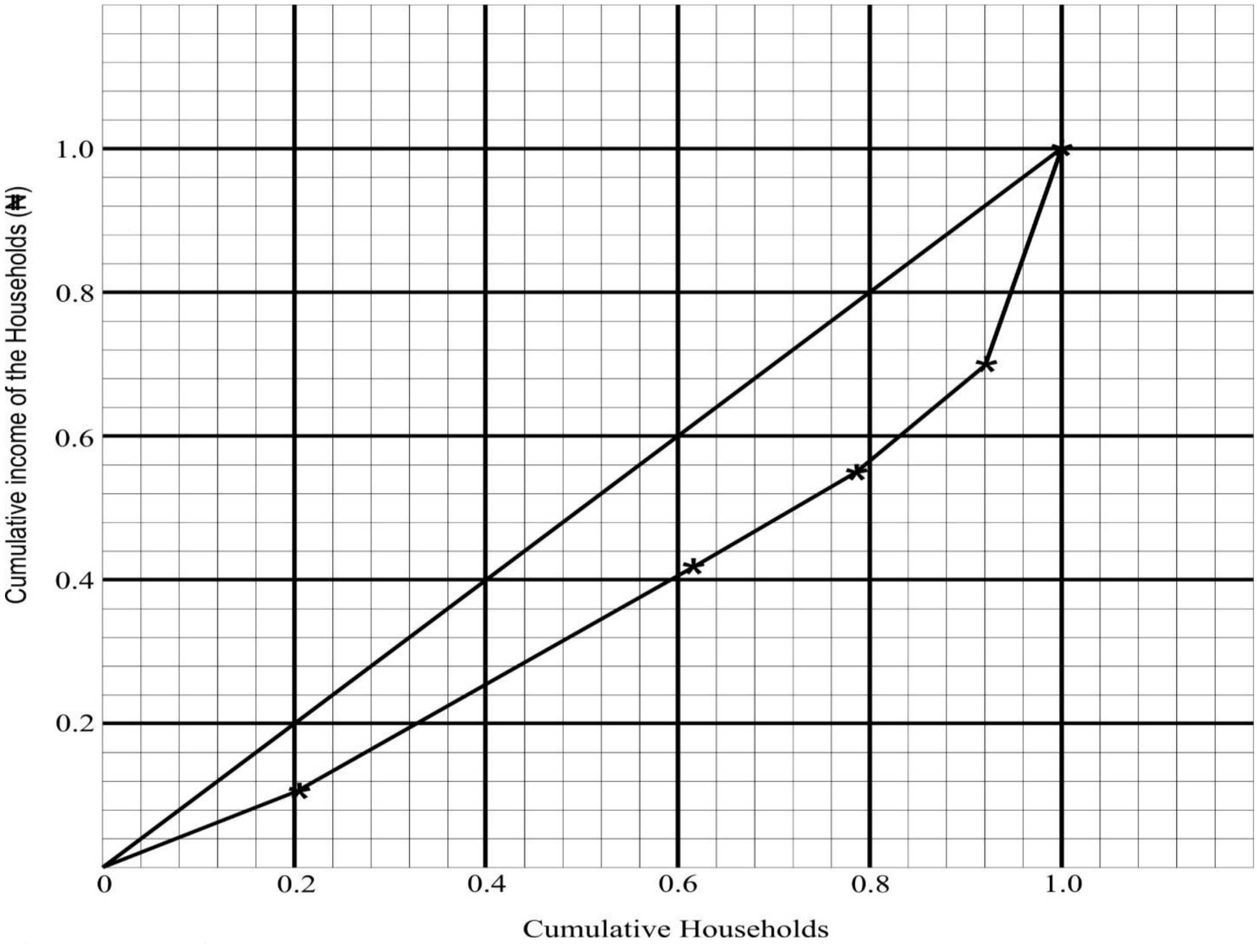

Fig. 1. Respondents' Lorenz Curve

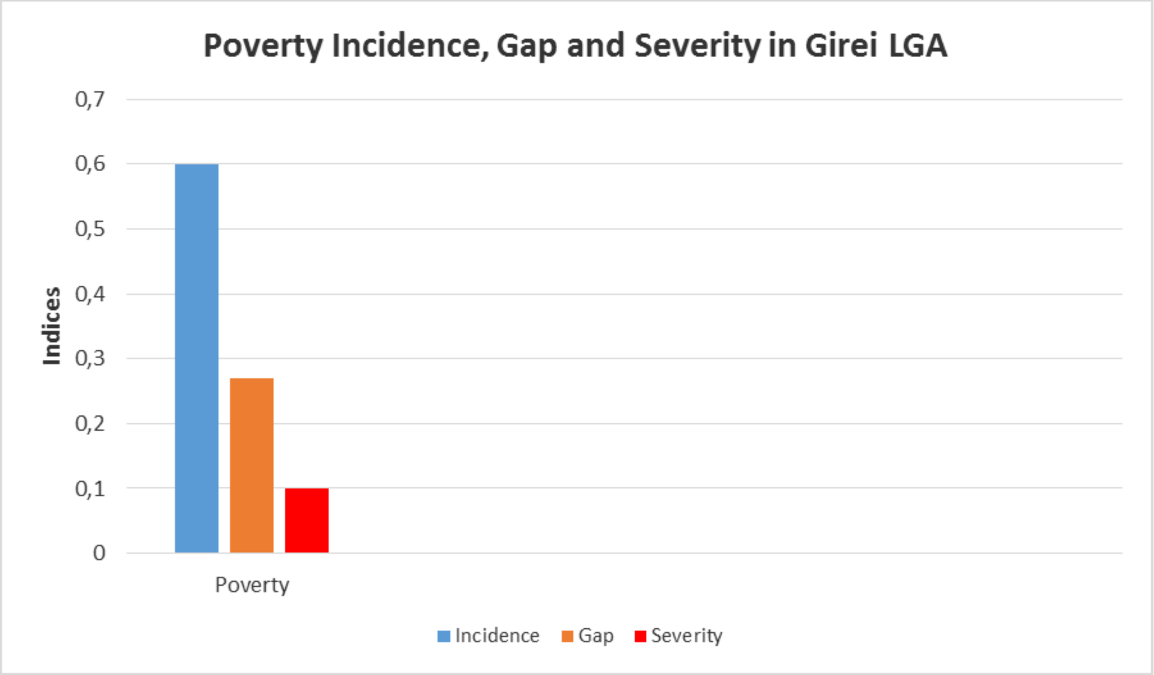

Fig. 2. Poverty, Depth and Severity in Girei LGA
Source: Field survey, 2014

Table 5. Distribution of Respondents' Poverty Coping Strategies (**N=80**)

Strategy (ies)	Frequency	Participation Rate (%)
Cultivation of Several Crops/Farm Expansion	46	57.5
Animal Husbandry	31	38.75
Beer Brewing/Sale	09	11.25
Craft Making	09	11.25
Remittance	18	22.50
Trading	21	26.25
Hair Dressing/Barbing	44	5.00
Carpentry	02	2.50
Casual Wage Labour	12	15.00
Firewood Gathering/Sale	03	3.75
Grinding Mill Operation	02	2.50
Masonry/Bricklaying	03	3.75
Mechanic/Electrician	02	2.50
Motorcycle Transport (*Okada*)	13	16.25
Migration	01	1.25
Oil Pressing	02	2.50

Source*:* Field survey, 2014

CONCLUSIONS

This study analysed poverty in some households in Girei Local Government Area of Adamawa State. The findings of this research revealed that, there is high incidence of poverty and income inequality among the respondents in the area. Furthermore, in response to the challenge of poverty, majority of the respondents adopt agricultural intensification and livelihood diversification (especially in non-farm activities) as coping strategies.

Based on these findings, it is therefore recommended that:

-Farming activities should be made more profitable for the farmers thorough timely provision of agricultural inputs (especially improved seeds, fertilizer and machineries) at affordable rates.

-There is the need for all development actors in the area to provide basic social amenities like roads, health facilities, portable drinking water and electricity among others. This will improve the quality of lives of the residents of the area.

-Poverty alleviation initiatives should also promote the provision of micro loans to the people in order to encourage diverse and more remunerative livelihood activities.

-Entrepreneurial skills in the area should be encouraged through trainings and provision of start-up capital where possible.

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FARMERS PERCEPTION ON ORGANIC MANURE USAGE AMONG ARABLE CROP FARMERS IN JALINGO LOCAL GOVERNMENT AREA OF TARABA STATE, NIGERIA

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Abstract

The study analysed the perception of organic manure use among arable crops farmers in Jalingo Local Government Area Taraba State, Nigeria. Structured questionnaires were used to collect primary data from 114 respondents who were proportionately and randomly selected. The data were analyzed using descriptive and logit regression model. The results reveal that 86% of the respondents were males, 67.6% were between the ages of 32-50 years, 74.6% were married, 72.8% have house hold size of between 1-10 persons, 88.7% had one form of education or the other, 57%, had 1-5 hectares of land, 51.8% have 1-10 years of farming experience and 52.6% have access to extension service. The findings also revealed that 92% of the arable crops farmers used organic manure. It also revealed that arable crop farmers in the study area have diverse perceptions on organic manure usage. Logit regression results revealed that farming experience, level of education, farm size, extension contacts and distance of farm from home contributed significantly to the use of organic manure in the study area. The findings also shows that odour, encouragement of high growth of weeds by the organic manure, preparation of the compost manure were the very serious constraints to the use of organic manure. Application of organic manure, transportation to farm, accessibility and availability of the organic manure are the serious constraint to the use of organic manure by the respondents. The study concluded that majority of the farmers in the study area were male, youth, married and educated. They are small holder farmers with ample farming experience. They have favourable perception toward the use of organic manure. The more the farmers increase their farm size, the more the tendency of using organic manure. So also, high level of education of farmers and extension contacts tends to influence their organic manure usage. The study recommended that Government should support farmers and introduce policies that will enable the farmers to own and cultivate large scale farms. Extension agents should intensify effort on educating the arable crops farmers on organic manure utilization.

Key words: *organic manure, arable crops, farmers, Nigeria*

INTRODUCTION

Increasing agricultural production to meet teaming population demand relies on the principles of expansion of land area for cultivation or improving the yield per land area. As a result of population pressure on land, among other factors, land expansion seems not feasible some times. In addition, soil fertility declines as a result of continuous cropping which is the most prevalent system of farming in Nigeria. Consequently, farmers skewed their attention more on intensification strategies to improve farm productivity. They use fertilizers to replenish soil nutrient lost due to poor soil management practices.

Fertilizers are in the forms of inorganic and organic. Inorganic (chemical) fertilizer are very expensive and beyond the reach of resource-poor farmers and not readily available as at when needed by the resource-poor farmers [5]. It has also been proven to have negative consequences on the environment and health aspect. Human survival demands that environmental considerations should underpin all aspects of development whether physical or social [4]. Organic Manures are fertilizers made from cattle dung, excreta of other animals, rural and urban composts, other animal wastes, crop residues and green manures. They are time tested materials for improving the fertility and productivity of soils, and vary widely in the amount of plant nutrients that they contain.

Compost is one of the less concentrated organic manures, but it is extremely valuable in adding extra body to soils especially the sandy ones. Compost can also help to lighten heavy clay soils.

Farmers' perception of a technology is a key determinant in the decision to use [8]. If farmers' perceptions are that the technology is not profitable, there will be low investment in the technology. To assess perception of organic manure use by farmers, so many factors should be considered and examined. These factors include: farmers' characteristics such as education, experience, age, household size; farm structure such as farm size, distance of farm from homestead; and institutional factors such as contact with extension agents and access to credit facilities [11].

The most prevalent widespread challenge in Nigeria is food insecurity and poverty [8]. The inherent poor soil fertility in both tropical and sub-tropical areas has become a major constraint to arable crops farmers in Sub-Sahara Africa. Evidence shows that most farmers in the area are not adequately compensating for soil nutrient loss caused by intensive cultivation practices. Hence, declining soil fertility has been highlighted as the major reason for slow growth in food production in the region [8].

On the other hand, population is increasing very fast while agricultural land remains constant or even decreasing due to development and the conversion of agricultural land to residential and industrial sites. With this scenario, the pressures on the need to feed the growing population at hand are immense. To increase production to its maximum within shortest possible duration while maintaining the ecosystem and without pollution seem an attractive solution to food shortage. With this threat, there is need to intensify organic farming in order to bring back soil fertility. The availability of inorganic fertilizers to farmers at appropriate time is not guaranteed, because, the commodity was politicized by government officials. Thus, the main constraints to fertilizer use are seen as high prices, low fertilizer quality and non-availability of fertilizer at the time required [7].Various studies were conducted on organic manure use in different part of Nigeria. For example, a study was carried out on economics of organic manure use by food crop farmers in ecologically vulnerable areas of Imo State, Nigeria [12]. However, there is little evidence of empirical study carried out in relation to perception of organic manure use in Jalingo Local Government Area of Taraba State. To fill this gap, the study answered the following questions:

(i)What are the socio-economic characteristics of arable crop farmers in Jalingo Local Government Area?

(ii)What type of organic manure do the respondents use?

(iii)What is the respondents' perception of organic manure use?

(iv)What are the factors that influence the use of organic manure?

MATERIALS AND METHODS

The study was conducted in Jalingo Local Government Area Taraba State, Nigeria. The area lies between latitudes 6˚.30' to 9˚.36'north and between longitudes 8˚.50' to 11˚.25″ east of Greenwich Meridian (www.maplandia.com, 2003). The local Government Area has a population of 139,845 people [9]. The climate is marked by two contrasting seasons; the rainy season which normally starts from April to October and the dry season which lasts from November to March. The average yearly rainfall is 1350mm, while the mean annual temperature is 25˚c with a total land area of 1,380 km^2 [16]. Major crops grown are arable in nature the main farm produce are maize, rice also livestock farming.

Data for this study were obtained mainly from primary source; Semi-structured questionnaires were used for the collection of data.

Simple random sampling techniques were employed to select the respondents of the study.

To ensure effective coverage of the study area, respondents were randomly selected from each of the districts that constituted the study area (Majidadi, Kachalla sembe, Sintali A, Sintali B, Yelwa, Kona, Sarkin Dawaki and Barade). Three villages were chosen randomly from each district because of the fair distribution of villages among the districts, making a total of 24 villages selected from the districts. Five respondents were selected at random from each of the selected 24 villages making a total of 120 respondents as the sample size of the study. Finally, 114 questionnaires were successfully retrieved and used for the analysis.

Descriptive statistics such as frequency distribution, means and percentages was used to achieved objectives i and ii and Likert scale was used to achieve objective iii, while Binary Logit regression was used to address objective iv.

Descriptive statistics

The mean of group data is expressed as:

$\bar{X} = \frac{\sum fx}{n}$……………………………………(1)

where: $\bar{X} = mean$

$\sum f\,x = sumofindividualobservation$

n = sample size

The mean of ungroup data is given by:

∑Xi/n……………..………..…………(2)

where:

∑Xi=Sum of observed values

n = Number of observations

Binary Logit regression model

The binary regression model was used to address objective vi. The explicit form of the Logit regression model is expressed as:-

$Logit\,(Y_I) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_9 x_9 + e$ -...(3)

where Y_I = Use of organic manure (1 = used, 0 = otherwise)

x_1= Age of the household head (years)

x_2 = Sex (male 1, female 0)

x_3= Household size (number)

x_4= Educational status of the farmer (years in school)

x_5= Farm Size (ha)

x_6= Farming Experience (years)

x_7 = Contact with Extension agents (Yes =1, No = 0)

x_8 = Total income (₦).

x_9 = Distance of farm from farmers homestead (km)

β_0 = Intercept

β_1 -------------- 8 = parameters to be estimated

RESULTS AND DISCUSSIONS

Socio-economic characteristics of Respondents

Result on Table 1 shows that majority (86.0%) of the respondents were male, while female constitutes only 14.0% in the study area. This implies that agricultural production especially arable crop farming using organic manure was dominated by males. This result could be because of the socio-cultural background of the people in the study area and also due to the fact that arable crop farming is intensively labour demanding. In addition, majority of the respondents 58.8% were between the age 21-40 while those that are within the age of 50 and above were only 6.1%. This means that the arable crops farmers in the study area are within their active age of agricultural production. Therefore, there is likelihood of high productivity and usage of organic manure [6]. The study furthers, shows that majority of the respondents are married (74.6%). This result is in line with the findings of [1] who opined that majority of the arable crops farmers were married. It may be because married people are more committed to farming activities because of their responsibilities.

About 73.0% of the respondents have house hold size of 1-10, and 18.4% of the respondents have house hold size of 11-20 and 0.9% of the respondents has house hold size of above 30 persons. This is highly indicative of extended family system in the study area. Farmers have advantage of family labour availability if many house-hold members participate in farms [4]. The result also shows that shows that 53% of the respondents have no formal education, only 9% of the respondents had tertiary education. This implies that farmers in the study area may likely adhere to old method of agricultural practices than to venture into new innovations and thus, give preference to organic manure usage instead of inorganic fertilizers.

This could be so because, when a new technology was introduced, the rate of its adoption is expected to be high among the educated farmers, while organic manure utilization might be highly patronized by the less privileged economically and those that practice traditional farming system.

Table 1. Socio-economic Characteristics of the Respondents (N = 114)

Variable	Frequency	Percentage
Gender		
Male	98	86.0
Female	16	14.0
Total	**114**	**100.0**
Age		
21-30	30	26.3
31-40	37	32.5
41-50	40	35.1
Above 50	7	6.1
Total	**114**	**100.0**
Marital Status		
Married	85	74.6
Single	27	23.7
Widowed	2	1.8
Total	**114**	**100.0**
Household Size		
1-10	83	72.8
11-20	21	18.4
21-30	9	7.9
Above 30	1	0.9
Total	**114**	**100.0**
Educational Attainment		
No formal Education	60	52.63
Primary School	31	27.19
Secondary School	13	11.40
Tertiary education	10	8.77
Total	**114**	**100.0**
Farm Size		
< 1	6	5.3
1-5	65	57.0
6-10	19	16.7
Above 10	24	21.0
Total	**114**	**100.0**
Farming Experience		
1-10	59	51.8
11-20	37	32.5
21-30	11	9.6
Above 30	7	6.1
Total	**114**	**100.0**
Access to Extension Service		
Yes	60	52.6
No	54	47.4
Total	**114**	**100.0**
Usage of Organic Manure		
No	9	7.9
Yes	105	92.1
Total	**114**	**100.0**

Source: Field survey, 2016

The result of the study further, shows that majority (57%) of the arable crops farmers in the study area had 1-5 hectares of farm land. 16.7% has 6-10 hectare, and 21.0% of the respondents has more than 10 hectares. The findings revealed that more than half of the farmers in the study area were small scale farmers. The implication of the finding is that food production is at subsistence level in the study area. Table 1 indicated that about 52% of the respondents have 1-10 years of farming experience. Experience brings above specialization and adherence to the use of technology, therefore the respondents may be specialist in the use of organic manure. 9.6% and 6.1% have farming experience of 21-30 years and above have 30 years respectively. This means that the respondents have long years of farming experience. More than half (53%) of the arable crops farmers in the study area had contacts with extension agents. Extension service is very essential to the improvement of farm productivity and efficiency among farmers [13].

Types of Organic Manure Used by the Respondents

Table 2 shows that 31.4% used cattle dung, 22.05% used sheep dung, 14.4% used goat dung, 12% used poultry droppings, 8.85% used Green manure, 3.3% used compost manure, 5.1% used Farm yard manure, 2.9% used Kitchen waste.

Table 2. Distribution of the Respondents by Type of Organic Manure Used

Type of organic manure Used	Frequency (No.)	Percentage (%)
Cattle dung	54	31.40
Sheep dung	38	22.05
Goat dung	25	14.40
Poultry droppings	21	12.00
Green manure	15	8.85
Compost manure	6	3.30
Farm yard manure (FYM)	9	5.10
Kitchen waste	5	2.90
Total	173*	100

Source: Field survey, 2016*Multiple responses

The most used type of organic manure is the cattle dung and this could be because of its availability due to large number of cattle being reared in many houses within the metropolis. It is also associated with the large number of cattle in the study area. Cattle manure has a significant amount of nitrogen [15].According to [15] Cattle manure obtained during the rainy season when there is abundant green grass for cattle to graze has the highest percentage of plant nutrients than those obtained during the dry season.

Respondents' Perception towards Utilization of Organic Manure. Table 3 revealed crop farmers' perception on utilization of organic manure, and was measured on five point Likert type scale of strongly agree which was assigned the value of five, to strongly disagree with an assigned value of one. The respondents indicated their responses to 22 statements on the rating scale provided.

The cut-off mean was calculated to be 3.0, while the mean for each statement was calculated and compared with the cut-off mean. Any mean that falls above the cut-off mean indicates that the respondent agreed to the statement, and any mean that falls below the cut-off mean indicates that the respondent disagreed with the statement. Thus, the result on Table 3 shows that respondents agreed that; organic manure increases soil fertility ($\bar{X}$=4.51); improves water conservation ($\bar{X}$=3.78); increases production more than conventional fertilizers ($\bar{X}$=3.68); is relatively not easier to handle than inorganic fertilizer ($\bar{X}$=3.82); is easier to access than any other fertilizer ($\bar{X}$=3.74); is less capital intensive ($\bar{X}$=4.31); retains soil fertility over time ($\bar{X}$=4.21).

Table 3. Distribution of the Respondents Based on Perception of Organic Manure Usage

Perception statements	SA Freq	A Freq	U Freq	D Freq	SD Freq	TPS	Mean
Organic manure improves soil fertility	75(65.8)	28(24.6)	6(5.3)	4(3.5)	1(0.9)	514	4.51
Organic manure improves water conservation	30(26.3)	44(38.6)	26(22.8)	13(11.4)	1(0.9)	431	3.78
Use of organic manure does not reduce cost of production	4(3.5)	8(7.0)	13(11.4)	59(51.8)	30(26.3)	239	2.10
Organic manure is not as effective as inorganic fertilizers	8(7.0)	16(14.0)	13(11.4)	48(42.1)	29(25.4)	268	2.35
Organic manure is not easier to handle than inorganic fertilizer	28(24.6)	56(49.1)	15(13.2)	12(10.5)	3(2.6)	435	3.82
It is easy to access the organic manure than any other fertilizer	26(22.8)	55(48.2)	16(14.0)	12(10.5)	5(4.4)	426	3.74
Using organic manure increases production than conventional fertilizer	25(21.9)	46(40.4)	28(24.6)	12(10.5)	3(2.6)	420	3.68
Use of organic manure pollute farm and it environment	10(8.8)	44(38.6)	22(193)	25(21.9)	13(11.4)	328	2.88
Mingling with organic manure is dangerous to health	8(7.0)	41(36.0)	22(19.3)	32(28.1)	1199.6)	339	2.97
Organic manure is less capital intensive	42(36.8)	67(58.8)	3(2.6)	2(1.8)	-	491	4.31
Organic manure makes produce more nutritious than inorganic fertilizer	37(32.5)	59(51.8)	15(13.2)	3(2.6)	-	472	4.14
Produce from organic manure reduces health risk	22(19.3)	63(55.3)	18(15.8)	7(6.1)	4(3.5)	434	3.81
organic manure application does not require special skill	23(20.2)	68(59.6)	8(7.0)	8(7.0)	7(6.1)	434	3.81
Organic manure does not encourage commercial system of production	16(14.0)	52(45.6)	22(19.3)	18(15.8)	6(5.3)	396	3.47
Organic manure use increases farmers income	26(22.8)	56(49.1)	19(16.7)	12(10.5)	1(0.9)	437	3.83
Organic manure retain soil fertility over time	43(37.7)	55(48.2)	13(11.4)	3(2.6)	-	480	4.21
Organic manure reduces soil erosion	20(17.5)	50(43.9)	31(27.2)	9(7.9)	4(3.5)	415	3.64
Organic manure encourages weed growth	19(16.7)	57(50.0)	21(18.4)	14(12.3)	3(2.6)	417	3.66
Use of organic manure reduces environmental pollution in the cities	30(26.3)	45(39.5)	25(21.9)	11(9.6)	3(2.6)	430	3.77
Application of organic manure is technically easy	25(21.9)	64(56.1)	13(11.4)	11(9.6)	1(0.9)	443	3.89
Not all plant do well with organic manure	8(7.0)	36(31.6)	25(21.9)	26(22.8)	19(16.7)	330	2.89
Use of organic manure will attract more pest and diseases	13(11.4)	31(27.2)	27(23.7)	31(27.2)	12(10.5)	343	3.01

Source*:* Field Survey, 2016

Figures in Parenthesis indicate percentage

NB: SA = Strongly agreed, D= Disagreed; A= Agreed; SD= Strongly Disagreed; U= Undecided

On the other hand, respondents disagreed that: using organic manure does not reduce cost of production ($\bar{X}$=2.10); organic manure is not as effective as inorganic fertilizer.

Factors Influencing the Use of Organic Manure.

The result of the logit model is presented in Table 4. The obtained log likelihood ratio is 21.541 and the Cox and Snell R^2 value of the model is 0.648. Thus, the overall model is significant and the explanatory variables used in the model are collectively able to explain the factors influencing the use of organic manure. Nine variables were used to determine the factors that influence the use of organic manure in the study area. Five of the variables namely: age, gender, farming experience, extension contacts and distance of farm from home significantly influence the use of organic manure in the study area.

Gender X2, farming experience X6 and extension contact X7 were positively significant to the respondent's use of organic manure. Age (X1) and farm distance (X2) variables had negative effects on the use of organic manure and was significant at 5% and 1% respectively.

Gender of the farmers significantly affects the use of organic manure at 10% and had positive influence on the use of organic manure.

This implies that, being a male household head, increase the probability to the use of organic manure. This could be due to tedious nature involved in transportation and spreading on farm of the organic manure.

The negative sign of the coefficients implies that a unit increase in age and distance of the farm from homestead of the farmers decreases the probability to the use of organic manure. The more the farmers cultivates arable crops close to their homes the more they use organic manure.

This may be because of high cost of transporting of organic manure to the farms. According to [5] in a study conducted in Delta State, Nigeria revealed that decision to use organic manure were significantly determined by: farming experience, distance of farm from home, level of educational attainment, farm size and frequency of extension contact.

The result of the analysis also revealed that farming experience influence the use of organic manure at 5% level of significance with positive coefficient meaning that as farmers acquires more years of farming experience the probability that their level of organic manure use will increase. Similarly, extension contacts influence the use of organic manure at 5% level of significance with positive coefficients. This implies that the more the arable crops farmers in the study area had contacts with extension agents the more the probability to use organic manure.

Table 4. Logit Regression Analysis on Factors Influencing the Use of Organic Manure

Variables	Coefficient	S.E	Wald	Df	Sig.	EXP (B)
Age (X_1)	-.321	.140	5.244	1	.022**	.726
Gender (X_2)	6.777	3.556	3.633	1	.057*	877.536
Household size (X_3)	-.501	.327	2.340	1	.126	.606
Education level (X_4)	.031	.191	.027	1	.871	.969
Farm size (X_5)	.093	.628	.022	1	.882	1.098
Farming Experience (X_6)	.225	.105	4.403	1	.036**	1.133
Extension contacts (X_7)	12.083	4.816	6.293	1	.012**	176790.835
Total Income (X_8)	-.488	1.461	.111	1	.738	.614
Farm Distance (X_9)	-.229	.102	3.612	1	.004***	1.257
Constant	5.852	5.757	1.033	1	.309	348.031

Source*:* computer output (SPSS) analysis, 2015
*** Significant at 1%, ** Significant at 5% and * Significant at 10%

Constraints to the Use of Organic Manure.

Table 5 shows that odour and physical composition, encouragement of high growth of weeds by the organic manure, preparation of the compost manure were the very serious constraints to the use of organic manure with mean of 3.81, 3.76, and 3.58 respectively.

Table 5. Distribution of the Respondents Based on Constraints to the use of organic manure

Constraints	Mean	Remark
Availability of organic manure	3.23	Serious constraint
Accessibility of organic manure	3.25	Serious constraint
Transportation to farm	3.37	Serious constraint
Preparation of compost manure	3.58	Very serious constraint
Cost of transportation	2.67	Not a constraint
Application of the organic manure	3.39	Serious constraint
Its odour and physical composition	3.81	Very serious constraint
Encouraged high growth of weed	3.76	Very serious constraint

Source: Field survey, 2016

Likert Scale Midpoint Analysis ≥ 3.5 is Very serious constraint
3.0 - 3.49 is Serious constraint
2.0 – 2.49 Not serious constraints
≤ 2.0 is Very unserious

Application of organic manure, transportation to farm, accessibility and availability of the organic manure are the serious constraint to the use of organic manure by the respondents with mean of 3.39, 3.37, 3.25 and 3.23 respectively.

The use of manure by vegetable farmers in Sissala, Birim and Shama districts, Ghana revealed that, bulkiness, odor, preparations, accessibility, application and problems of transporting the manure to the farm are the major source of worry to majority of the farmers. Most farmers also stated that manure may bring pest and disease to crops and they are also not readily available and attract a lot of insects and enhances weed growth [3].

CONCLUSIONS

It is concluded that majority of the farmers in the study area were male, youth, married and educated. They are small holder farmers with ample farming experience. Level of education of farmers and extension contacts tends to influence their organic manure usage. They have favourable perception toward the use of organic manure

Based on the findings of the study, the following recommendations were made:

(i)Government should support farmers and introduce policies that will enable the farmers to own and cultivate large scale farms.

(ii)Extension agents should intensify effort on educating the arable crops farmers on the advantages of organic manure utilization

(iii)Government should device the means of making organic manure available and accessible to the farmers

(iv)Awareness campaigns on the discouragement of inorganic fertilizers should be embanks by stakeholder, donor agencies and farmers organizations

(v)Farmers are advised to use the local means of transporting the organic manure at their disposal to reduce cost of transportation

(vi)Farmers should cooperate with livestock owners so as to have livestock stay on their farms for mutual benefit.

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GENDER EQUALITY, CHANCES EQUALITY AND INTANGIBLE ASSETS IN THE KNOWLEDGE SOCIETY

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Abstract

Achieving a high level of competitiveness and sustainable development and the consolidation of a real democracy is requiring a balanced participation of women and men in all the areas of socio-political and economic development. The dissemination of the related studies shows that women are one of the groups of people vulnerable to the effects of transition. In this regard we note an increased rate of the long-term unemployment by limiting the access to jobs, generally the better paid but also by participating in the underground economy, it does not provide support and access to a social security system. Human capital, as an essential component of the intangible assets, constitutes a real mean of production and the future growth of investments in production. It is leaving, but not transferable as land, labor and capital assets. Investing in human capital is considered to be one of the most cost-effective and should be a priority for any community that you propose to support its sustainable economic and social development. Regardless of gender or age, human capital is and will remain the main source of economic growth and sustainable development.

Key words: *chances equality, gender equality, human capital, intangible assets, sustainable development*

INTRODUCTION

Kofi Annan (2002) stated that gender equality is more than an end in itself [9]. It is a prerequisite to counter the competition reducing poverty, promoting sustainability (sustainable development) and building good governance.

Globally, gender equality and chances equality is a fundamental right in the European Union.

Equality chances imply the existence of equal opportunities of development that promotes equal treatment for men and women, with no differences or differences caused by religion, ethnicity, age, disability or sexual orientation. In other words, it promotes non-discrimination and social inclusion. Is the concept that all human beings have the right to develop their capabilities and skills can make choices without the limitations imposed by strict roles. The existence of different behaviors, make the aspirations and needs of women and men are considered, valued and favored equally, demonstrating that these two parties have every right to enjoy the same freedom to fulfill dreams or aspirations.

In the context of equal opportunities we discuss on the insurance of full participation of all persons to economic and social life, taking into account the capacities, needs and aspirations of people of different male and female, as well as their equal treatment.

According to the Inclusion Barometer 2010 [4], equality is a concept familiar to the entire population and there were made the following progress in this area:

-number of women in employment is increasing, but remains below that of men, even if the majority of students and university graduates are women;

-women still earn on average 17.8% less than men for every hour worked and this figure remains at a stable level;

-women are still underrepresented in political and economic decision-making positions, although in the last decade, the number of those who occupy such posts has increased;

-family responsibilities are still unevenly distributed between women and men;

-risk of poverty is greater for women than for men;

-women are the main victims of gender based violence and human trafficking.

By equal chances and equal treatment between women and men in labor relations is thy discriminatory access [8]:

-choice or free exercise of a profession or activity;

-employment on all vacant posts and at all levels of the professional hierarchy;

-equal pay for work of equal value;

-counseling and vocational guidance programs for initiation, qualification, improvement, specialization and retraining;

-promotion at any hierarchical and professional level;

-working conditions that comply with health and safety at work, according to the legislation in force;

-benefits other than salary, as well as public and private systems of social security;

-organizations, trade unions and professional bodies, as well as the benefits granted by them;

-social benefits and services, granted under legislation.

Gender equality involves the process of assessing the implications for women and men irrespective of the planned action, including legislation, policy programs, in all areas and at all levels.

The gender term takes into account beliefs, stereotypes, ways of action, roles and social statuses, which apply depending on specific contexts.

In society, women and men do not have the same roles, resources, needs or interests. They do not have an equal contribution in making decisions. The values attributed to *"women's work"* and *"men's work"* are not the same. The differences vary from one society to another, from one culture to another and are termed *"gender differences"*. Gender has direct references to social differences between women and men that are learned and constantly changing over time. It represents a conceptual tool which can analyze the roles, responsibilities, constraints, opportunities and needs of men and women regardless of the contextual plan. Gender roles and needs are influenced by class, age, race and ethnicity, culture and religion and geographical environment, economic and political. In any social context, gender roles can be flexible or rigid, similar or different, complementary or might be even conflicting. Besides differences between women and men, there may be differences within the same category in terms of socio-economic level, the power of decision or age.

MATERIALS AND METHODS

To discuss this topic easily, we analyzed the gender indicators system that monitors and evaluates the strategic objectives of the Beijing Platform for Action, which aims primarily interest of humanity, ensuring equality, development and peace for women.

The indicator system includes 52 indicators structured on key areas such as:

-Economic structures, participation in the activities of production and resources;

-Education;

-To healthy and related services;

-Public life and decision-making process;

-The human rights of women and female children.

Also, in 2013, the European Institute for Gender Equality (EIGE) [7] launched the ***European Index of Gender Equality*** that aims to scale phenomenon of gender equality.

Also, to support this research, we discussed through case study of the Provident Financial Romania - company *"where people matter"* which allowed me to reflect on the importance of human capital regardless of gender.

RESULTS AND DISCUSSIONS

European Index of Gender Equality is organized into six main areas:

(i)**Work:** analyzes the positioning of men and women in the labor market and relevant in formulating employment policies to increase the number of jobs and labor market participation in terms of gender equality. It has three sub-areas, namely: *participation, segregation* and *quality of work*.

(ii)**Money**: examine inequalities in the economic and financial resources of women and men (principle of equal pay for equal work for women and men - the Lisbon Treaty). It has two sub-areas: *financial* and *economic situation*.

(iii)**Knowledge:** show differences in terms of education and training. Helps reduce risk of unemployment and social exclusion. It has three sub-areas: *participation in education segregation* and *training throughout their lives.*

(iv)**Time:** focuses on the relationship between labor, domestic work and care and other activities (social, cultural, etc.). It has three sub-areas: *economic activities, caring activities* and *social activities.*

(v)**Power:** examine differences in representation in political and economic structures. It has three sub-areas: *political, social* and *economic.*

(vi)**Health:** Analyze the differences between women and men on the health status and access to the structures of the health care system. It is divided into three sub-areas: *health status, behavior* and *access to health services.*

There is also a **satellite field** in turn divided into fields of intersectional inequalities and violence.

Intersectional inequalities satellite field is composed of sub-areas like: *age, nationality, disability, ethnicity, religion, sexual orientation, social class*. Satellite violence field has two subfields:

(a)*Direct violence* as a direct form of discrimination between men and women as a human rights violation;

(b)*Indirect violence* with emphasis on stereotypes, attitudes affecting gender equality.

As values of this index are given scores from 1 (total inequality) to 100 (total equality).

The European average is 54 points, our country being last in the European Union, with a total value of 35.3 points, while in contrast, Sweden is in first place with 74.3 points.

Table 1. The European index of gender equality in relation to the main areas of action

	Index	**Labor**	**Money**	**Knowledge**	**Time**	**Power**	**Health**
RO	35.3	60.4	39.0	28.8	17.8	24.9	84.0
EU-27	54.0	69.0	68.9	48.9	38.8	38.0	90.1

Source: EIGE [7]

At European level, this index highlights that:

-women's access to labor market is not uniform for all professional categories;

-women have not yet come to occupy positions of responsibility in the same way as men;

-the choice of study certainly affect gender segregation in the labor market, both in terms of occupations and in terms of economic sectors.

Eurostat has defined a list of indicators of gender equality structured on the following subdomains: Education; The labor market; Income and social inclusion; Child care; Health.

Case study: *Provident Financial Romania - company "where people matter"*

This case study allows to reflect the importance of human capital regardless of gender.

Provident company focuses on developing human capital and invests in its improvement and furthermore, is actively involved in social life through programs aimed at helping people.

Provident former CEO, Steve Rice said in the magazine representatives provident: *"We are a company where people matter and we want to have an active role in the life of the communities in which we operate. Because our business is based on building lasting relations people cherish above all. We are committed to establish long-term relationships with our employees and customers; We get involved in the local community through programs aimed at helping people who live and work where are we today."* [6]

The activity of the provident is guided by the triangle values: *respect, clarity* and *responsibility* [2]. Clarity refers to the company's transparency and accessibility and honesty to customers, employees and business partners the rest. The company is committed to fulfill all that he proposed. Respect results from the appreciation of the people and to their viewpoint diversity and understanding of the differences existing between individuals. As an organization where *"people matter"*, Provident encourages people to use their full potential and make a commitment to build sustainable partnerships work [11].

Provident priorities are: financial education, disadvantaged children, people with special needs, environmental protection [3] and volunteering.

Employment policies of Provident Financial Romania are designed to attract, develop and retain the best people, and that is the reason why this company believes strongly in respect for others and equal opportunities for everyone, regardless of gender, age or sex. The company is committed to treating employees right. Values diversity and differences and discourages discrimination. The company is aware of the need for employees to find a balance between work and personal life. Therefore, Provident provides a fair and competitive remuneration, rewarding the skills and performance of employees through training programs and periodic evaluations, opportunities for personal development and career progression.

The company respects employees' right to express their views, even implementing systems that listen to their views. Lastly, Provident provides a safe and healthy work environment and strive hard to provide the best working conditions.

In 2010, Provident has hired 150 people, and 38 were promoted throughout the year, of which 31 in management positions. In 2011, the company had 640 employees in more than 40 cities in the country:

- Most senior management team members were recruited locally and are Romanians;
- 71% of employees have higher education, the average age being 32 years;
- About 51% of employees are women and 41% of middle and senior management positions are held by women.

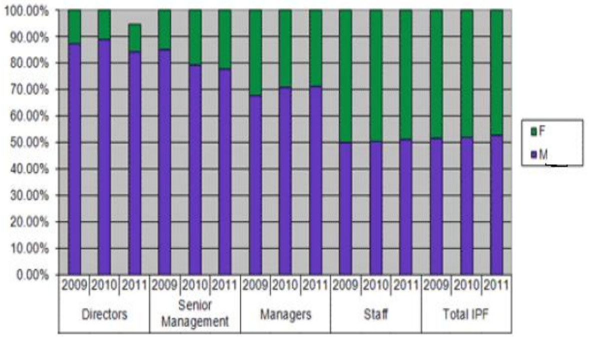

Fig. 1. Graphical representation of employees by gender, 2009-2011
Source: International Personal Finance Annual Report 2011, www.providentfinancial.ro [5]

From Fig.1, Provident appears that in the study period 2009-2011, men in control of the director or senior management positions registered a percentage between 69 and 89%, while women raised the bar on personal and financial staff posts total international *(total IPF)*. 41% of middle and senior management positions are held by women.

When it comes to being an executive, women occupy a very bad position. When we think about personnel, men have the exact same situation.

Also, in the graph presented above, in the period of 2009-2011, it was noticed an equality between men and women, both categories representing 50%.

Provident provides equal opportunities in recruitment and promotion, and the criteria are transparent and comprehensible. Only in 2014, 72 of the employees were promoted [10]. They are concerned about the health and personal safety of employees and their agents and apply the most effective processes and procedures set up with the best experts in the field.

Provident has a special guide on the safety and health at work, which contains rules and tips for its employees, it provides each employee since it considers that *"man is the most precious capital"* [1].

CONCLUSIONS

As a conclusion spot we can mention that the firm Provident puts great emphasis on human capital development, it believes in the skills and capacities, to exploit to the maximum, invests in the development and in the improvement of the employees and, last but not least, it recognizes the employees, regardless of gender. In other words, managers have done an excellent thing, namely that employees are responsible for the smooth running of the company.

We must remember that the term *"gender"* is not a replacement for the *"sex"* which refers strictly only to biological differences (for example, statistics are disaggregated by gender).

It is known that women are found mostly in jobs with low pay levels.

Increasing the number of women in the labor market, supporting their employment on the main positions occupied by males, promoting the program part-time, access ladies in management positions, ensuring the reconciliation between work and private life of men and women, causes removal of disparities women and men, including in terms of salary levels.

Now it has been proved that began to occur changes in the economic sector, where the women have begun to hold a sphere wider the functions of the board of the economic entities, especially in the private sector, where they are encouraged the capacities of the entrepreneurial spirit and managerial.

The elimination of discrimination based on the criteria of sex, express or understood, constitutes one of the conditions necessary to be able to build an equitable society and in order to be able to progress, which implies the state authorities and every politician. These measures will provide the opportunity for both parties involved.

Regardless of the decision-making process, there must be collaboration both categories of individuals.

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DIAGNOSTIC ANALYSIS OF SUSTAINABLE DEVELOPMENT IN TELEORMAN COUNTY

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Abstract

This article presents the synthesis of a research project which aims the diagnostic analysis of sustainable development in Teleorman county. The work methods used in this study consist of: analysis of resources, definition of rural territory, the global analysis of the indicators and SWOT analysis. Also, based on the documentation, it was intended: to analyse the existing county development and planning,to highlight the main issues and priorities, to suggest territorial development ideas on the short and medium term of the main objectives, to correlate the suitable territorial landscaping projects with the county development and sectorial policies. Following the global analysis of the key socio - economic indicators in Teleorman county, compared to the Southern - Muntenia part of the county that it belongs to, it is found that they are below the regional average . Given the geographic positioning of Teleorman county near the capital and especially its location next to the Danube River and the powerful enterprises in the area, there are chances for Teleorman county to get out of Romania's poorest counties list by investing both in the development of these old dating enterprises and also in Teleorman's major asset, the agro-tourism.

Key words*: cohesion, diagnostic, indicators, rural, Teleorman*

INTRODUCTION

Sustainable development is the process of development that comprises all the requirements without jeopardizing the future generations.

In 2002, the European Commission accredited SAPARD Agency (2002/638 / EC) as a competent authority to implement the program in Romania.

Its main objectives are [5]:
- to improve the living conditions of the economic agents and the residents in rural areas;
- to support in the joining process;
- increasing the competition and strengthening the agricultural sector;
- stabilizing the rural population;
- adjusting the agricultural sector and rural economy to EU standards;
- EU agricultural policy implementation and market diversification.

Through sustainable rural development, Romania has set four priorities [7]:

Axis 1: Improving access to markets and competitiveness of agricultural products;
Axis 2: Improving infrastructure for rural development and agriculture;
Axis 3: Rural development;
Axis 4: Development of human resources.

Local development is both a goal and a consequence of good local government, which must generate and maintain its collective welfare transfer mechanisms as for an individual welfare.

The main programs of the national rural development strategy are [1]:
- „ FARMER" program, which was established in 2005 by the Ministry of Agriculture and Rural Development;
- A program called „ Annuity rent AGRICULA" program that was unfolded by the end of 2009;
- INCREASE COMPETITIVENESS OF FOOD „ program "

Social cohesion is an important characteristic of a society based on social connections and relationships between units and individuals, groups, associations and territorial units [3].

The concept of social cohesion covers three categories of issues [4]:

- values, identity and culture, all defining a particular community;
- differences and divisions: inequalities and inequities, cultural diversity, geographic divisions;
- associations and networks, infrastructure, values and identity.

MATERIALS AND METHODS

Diagnostic Analysis of Teleorman county has been developed on the basis of defining rural territory referring to the location of the county in Romania, the topography, climate, fauna and vegetation and to its population.

Rural areas was analyzed in terms of local development, infrastructure and environment, community economic development and human resources, both social and natural.

Based on county's statistical indicators, a comparison between social and economic indicators of Teleorman county and the indicators of the region of Muntenia Sud, which Teleorman county is part of, has been made.

SWOT analysis was conducted in the terms of regional context, economic domain, industry and agriculture, administrative capacity, entrepreneurial environment, social services, employment and education, tourism potential, transport, public services and the environment

RESULTS AND DISCUSSIONS

The real GDP growth rate in the South Muntenia Region variaried between -0.5 % in the year 2010 and 9.8 % in 2008, the year when the economic crisis started.

In the Teleorman County, the GDP growth rate varied between -6.1 % in 2009 and 9.8 % in 2007. The figures show a worse situation regarding the GDP rate in Teleorman County compared to the region growth rate mainly after the year 2008. The same situation regard the GDP/inhabitant in Teleorman County where the figures are smaller than at the Region level (Table 1).

The growth rate of the average employed population in Teleorman county reflects that in this county there were less oportunities for finding a job by the local population compared to the situation at the Southern Muntenia Region (Table 1).

Also, *the unemployement rate* was higher in the period 2007-2014 in Teleorman County compared to the unemployment rate at Region level (Table 1).

The average net earnings/month and employee as well as the average net earnings per month growth rate were smaller in Teleorman County than in the Southern Muntenia Region (Table 1).

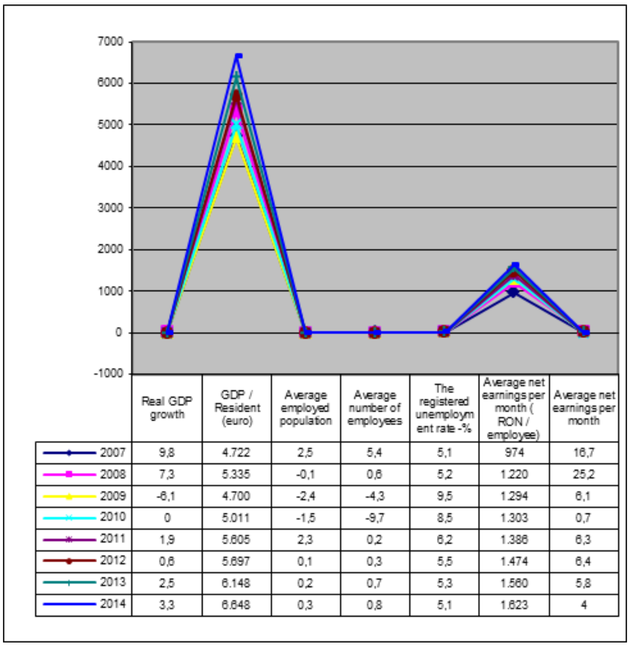
Table 1. Evolution of main socio – economical indicators of Teleorman county, compared to the southern – Muntenia region according to 2007-2014.

Real GDP growth rate (%)								
	2007	2008	2009	2010	2011	2012	2013	2014
Region	3.4	9.2	-3.1	-0.5	3.6	1.8	3	3.7
TR	9.8	7.3	-6.1	0	1.9	0.6	2.5	3.3
GDP / Resident (euro)								
	2007	2008	2009	2010	2011	2012	2013	2014
Region	4,722	5,335	4,700	5,011	5,605	5,697	6,148	6,648
TR	3,479	3,860	3,324	3,585	3,976	4,022	4,353	4,735
Average employed population growth rate (%)								
	2007	2008	2009	2010	2011	2012	2013	2014
Region	2.5	-0.1	-2.4	-1.5	2.3	0.1	0.2	0.3
TR	0.4	-0.5	-5.1	-5.1	0.5	-0.1	0.1	0.1
Average number of employees growth rate (%)								
	2007	2008	2009	2010	2011	2012	2013	2014
Region	5.4	0.6	-4.3	-9.7	0.2	0.3	0.7	0.8
TR	4.2	1.6	-7.1	-6.2	0	0.4	0.6	0.7
The unemployment rate -%								
	2007	2008	2009	2010	2011	2012	2013	2014
Region	5.1	5.2	9.5	8.5	6.2	5.5	5.3	5.1
TR	7.3	8	11.9	11	9	8.3	8	7.9
Average net earnings per month (RON / employee)								
	2007	2008	2009	2010	2011	2012	2013	2014
Region	974	1,220	1,294	1,303	1,386	1,474	1,560	1,623
TR	841	1,100	1,122	1,124	1,192	1,272	1,351	1,410
Average net earnings per month growth rate (%)								
	2007	2008	2009	2010	2011	2012	2013	2014
Region	16.7	25.2	6.1	0.7	6.3	6.4	5.8	4
TR	10.7	30.8	2	0.2	6	6.7	6.2	4.4

Source: National Institute of Statistics [2]

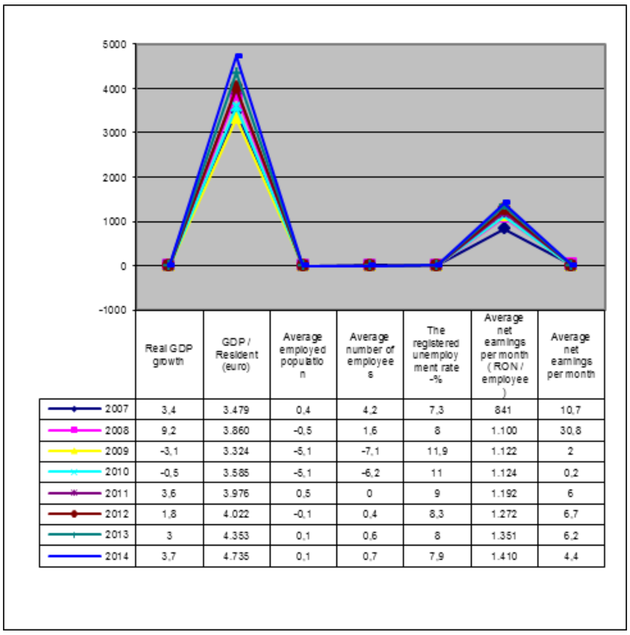
The same indicators are nicely and graphically illustrated for Teleorman County in Fig.1.

Also, the evolution of main socio – economical indicators of Southern – Muntenia Region are graphically presented in Fig.2.



	Real GDP growth	GDP / Resident (euro)	Average employed population	Average number of employees	The registered unemployment rate -%	Average net earnings per month (RON / employee)	Average net earnings per month
2007	9,8	4.722	2,5	5,4	5,1	974	16,7
2008	7,3	5.335	-0,1	0,6	5,2	1.220	25,2
2009	-6,1	4.700	-2,4	-4,3	9,5	1.294	6,1
2010	0	5.011	-1,5	-9,7	8,5	1.303	0,7
2011	1,9	5.605	2,3	0,2	6,2	1.386	6,3
2012	0,6	5.697	0,1	0,3	5,5	1.474	6,4
2013	2,5	6.148	0,2	0,7	5,3	1.560	5,8
2014	3,3	6.648	0,3	0,8	5,1	1.623	4

Fig. 1. Evolution of main socio – economical indicators of Teleorman county
Source: own calculus and design.



	Real GDP growth	GDP / Resident (euro)	Average employed population	Average number of employees	The registered unemployment rate -%	Average net earnings per month (RON / employee)	Average net earnings per month
2007	3,4	3.479	0,4	4,2	7,3	841	10,7
2008	9,2	3.860	-0,5	1,6	8	1.100	30,8
2009	-3,1	3.324	-5,1	-7,1	11,9	1.122	2
2010	-0,5	3.585	-5,1	-6,2	11	1.124	0,2
2011	3,6	3.976	0,5	0	9	1.192	6
2012	1,8	4.022	-0,1	0,4	8,3	1.272	6,7
2013	3	4.353	0,1	0,6	8	1.351	6,2
2014	3,7	4.735	0,1	0,7	7,9	1.410	4,4

Fig. 2. Evolution of main socio – economical indicators of southern – Muntenia region
Source: own calculus and design.

After a downward trend of GDP until 2010, it is followed by an increase in 2011, a decline in 2012 and a growth until 2014 (Table 2, Fig.3).

The growth of the real GDP is due to nominal GDP growth.

This increase's value is expressed in the current prices of a given period of time. The decrease of the real GDP is caused by the increase of general price index.

Table 2. Real GDP growth rate in Teleorman county for 2007-2014 (%)

Real GDP growth rate (%)							
2007	2008	2009	2010	2011	2012	2013	2014
9.8	7.3	-6.1	0	1.9	0.6	2.5	3.3

Source: National Institute of Statistics [2]

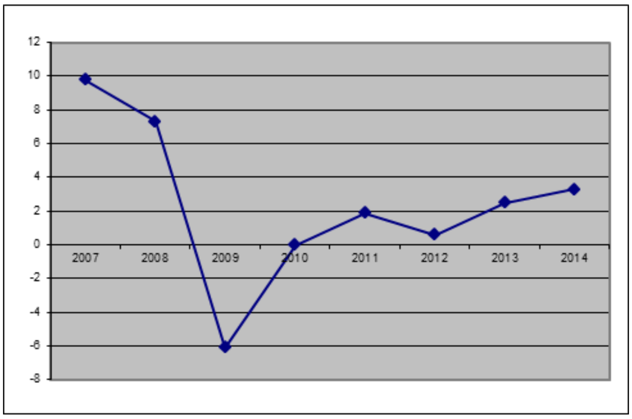


Fig. 3. Real GDP growth in Teleorman county
Source: own calculus and design.

Table 3. Real GDP growth rate in Southern – Muntenia region (%)

Real GDP growth rate (%)							
2007	2008	2009	2010	2011	2012	2013	2014
3.4	9.2	-3.1	-0.5	3.6	1.8	3	3.7

Source: National Institute of Statistics [2]

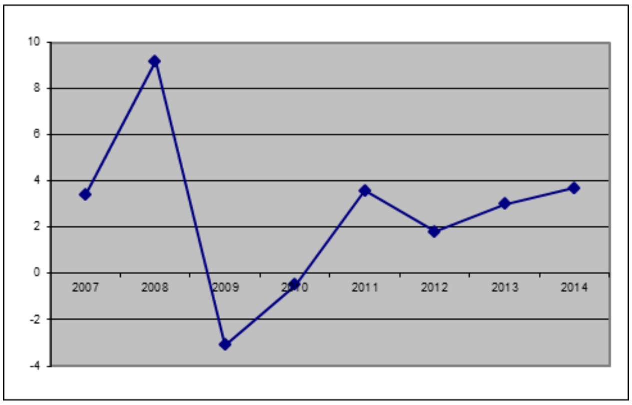


Fig. 4. Real GDP growth in Southern – Muntenia region
Source: own calculus and design.

In the South Muntenia region, an increased GDP occurred by the end of year 2008, followed by a drastic drop until 2009 and 2010, and then it followed a slight ascent by the end of the year 2014 (Tabel 3, Fig.4).

The real GDP / resident increases when it is about a positive economic growth, due to the volume growth of production and services in the analyzed period, and decreases when we have negative economic evolution, i.e. real

GDP grows more slowly than population growth.

In Teleorman county, the GDP/resident increased by 36 % from 3,479 Euro/capita in 2007 to 4,735 Euro/capita in 2014.

The only decline was recorded in the year 2009, by 4.5 % less than in the year 2007 (Table 4, Fig.5).

Table 4. GDP/resident (euro) in Teleorman county

GDP / Resident (euro							
2007	2008	2009	2010	2011	2012	2013	2014
3,479	3,860	3,324	3,585	3,976	4,022	4,353	4,735

Source: National Institute of Statistics [2]

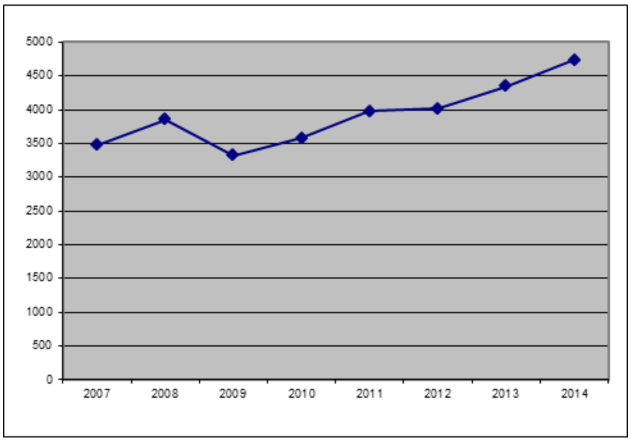


Fig. 5. GDP/resident (euro) in Teleorman county
Source: own calculation and design.

At the Southern Muntenia region, GDP/resident recorded a similar evolution. In general, the trend line was an ascending one, with the only inflexion in 2009.

The GDP/resident at the region level increased by 40.7 % from 4,722 Euro/capita in 2007 to 6,649 Euro/capita in 2014 (Table 5).

Table 5. GDP / resident (euro) in Southern – Muntenia region

GDP / Resident (euro							
2007	2008	2009	2010	2011	2012	2013	2014
4,722	5,335	4,700	5,011	5,605	5,697	6,148	6,648

Sorce: National Institute of Statistics [2]

The increase of GDP / Resident in the Southern – Muntenia region is characterized by an ascending slope until year 2008. The decrease in the year 2009 had no a great impact, because of the fact that starting from 2010 we can observe a constant raise until year 2014 (Table 5, Fig.6).

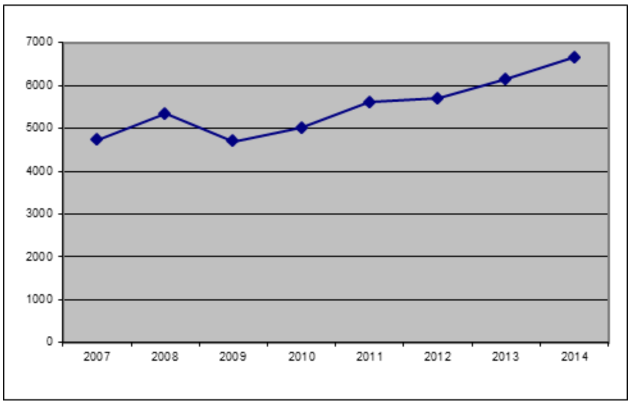


Fig. 6. GDP/resident (euro) in Southern – Muntenia region
Source: own calculus and design.

Workforce is represented by employed population and can grow by establishing new businesses, offering jobs, by the development of public activity and decreasing unemployment rate.

The growth rate of the average civil occupied population in Teleorman County varied between 0.5, the maximum level recorded in 2011 and -5.1 % registered in 2009, reflecting the deep impact of the economic crisis, when people could not find jobs and many of them were hired (Table 6, Fig.7).

Table 6. Average civil occupied population growth rate in Teleorman county (%)

Average employed population growth rate (%)							
2007	2008	2009	2010	2011	2012	2013	2014
0.4	-0.5	-5.1	-5.1	0.5	-0.1	0.1	0.1

Source: National Institute of Statistics [2]

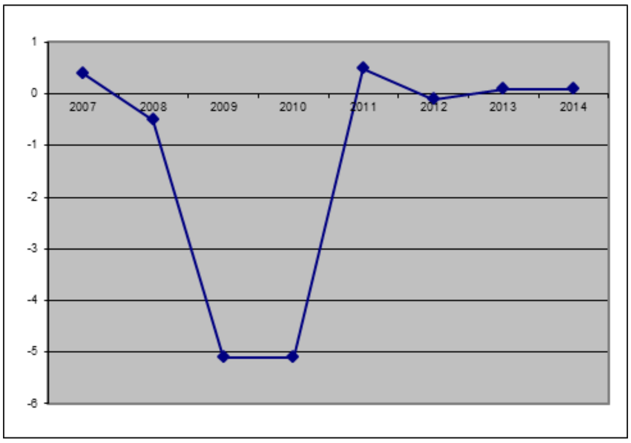


Fig. 7. Average civil occupied population in Teleorman county
Source: own calculus and design.

At the Southern Muntenia region level, the groth rate of the average civil occupied population was smaller than in case of Teleorman county.

Its level ranged between -2.4 % in 2009, the minimum level, and +2.5 % in the year 2007, before the economic crisis to begin.But, starting from the year 2010, the situation has become better and better till 2011, and in 2012 the growth rate deeply declined to 0.1 % and recorded just a slight increase till 2014. (Table 7, Fig.8).

Table 7. Average civil occupied population growth rate in Southern – Muntenia region (%)

Average employed population growth rate (%)							
2007	2008	2009	2010	2011	2012	2013	2014
2.5	-0.1	-2.4	-1.5	2.3	0.1	0.2	0.3

Source: National Institute of Statistics [2]

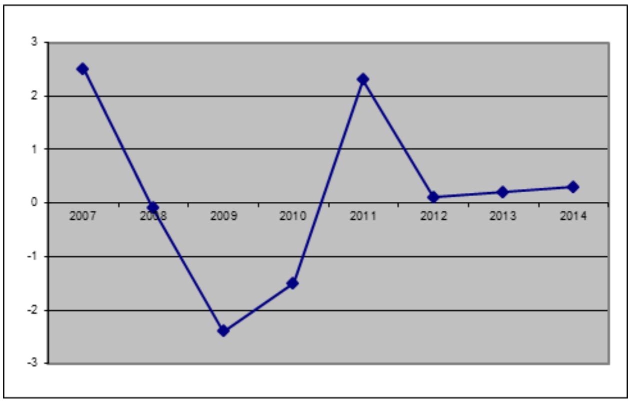


Fig. 8. Average civil occupied population in Southern – Muntenia region
Source: own calculus and design.

The value of the civil occupied population in Southern – Muntenia region dropped in the first 2 years until it reached a low level in 2009. It is followed by a comeback to the initial value in 2011, so that in the end, after a slight increase, it maintained a constant rate.

The average number of employees in Teleorman County has decreased until 2009, and then it is followed by a continuous increase until 2014.

The growth of average number of employees occurs when the number of enterprises increases, i.e. economic activity is developing in all areas, and it if the number of enterprises declines.

The growth rate of the average number of employees in Teleorman county declined from 4.2 % in the year 2007 to zero in the year 2011, the critical moment for this economic indicator. Then, it started to improve year by year till the year 2014, reaching 0.4 % in the last year of the analysis. The deepest decline of this indicator was noticed in the years 2009 and 2010, -7.1 5 and, respectively - 6.2 %, the years of the beginning of the economic crisis (Table 8, Fig.9).

Table 8. Average number of employees growth rate in Teleorman county (%)

Average number of employees growth rate (%)							
2007	2008	2009	2010	2011	2012	2013	2014
4.2	1.6	-7.1	-6.2	0	0.4	0.6	0.7

Source: National Institute of Statistics [2]

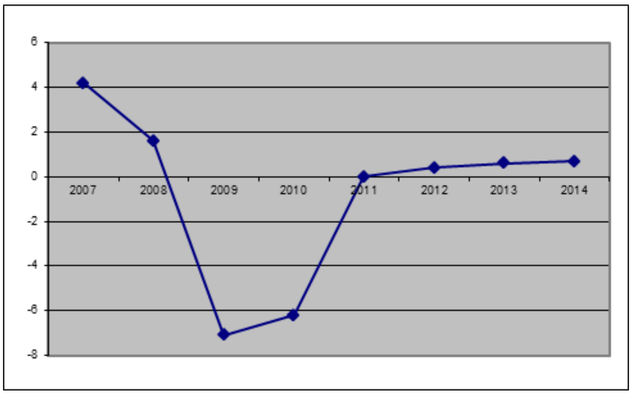


Fig. 9. Average number of employees in Teleorman county
Source: own calculus and design.

The study case over the average number of employees in the Southern – Muntenie region showed negative values by the end of the year 2010.

During the period 2010 – 2014, the average number of employees failed mainly in 2010, and then it recovered year by year but it remained almost constant at an average value between the initial value and the reached low peak of 0.8 % until the year 2014 (Table 9, Fig.10).

Table 9. Average number of employees growth rate in Southern – Muntenia region (%)

Average number of employees growth rate (%)							
2007	2008	2009	2010	2011	2012	2013	2014
5.4	0.6	-4.3	-9.7	0.2	0.3	0.7	0.8

Source: National Institute of Statistics [2]

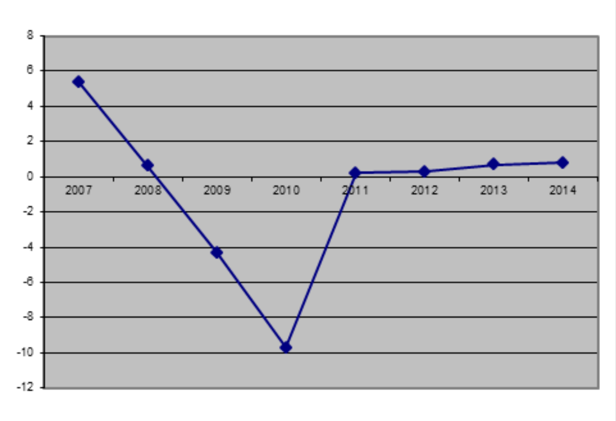


Fig. 10. Average number of employees in Southern – Muntenia region
Source: own calculus and design.

Evolution of unemployment rate in Teleorman County decreased until 2009, and then it followed a slight increase until 2014. . Unemployment rate increases when the number of unemployed people increases and the employed population decreases because the supply is greater than demand and falls when demand exceeds the offer, thus increasing the number of employees.

The unemployment rate ranged between 7.3 %, the minimum level in the year 2007, and 11.9 % recorded in the year 2009, when the crisis started.

From that moment, the unemployment rate has continuously declined reflecting an improved situation of jobs (Table 10, Fig.11).

Table 10. Rate of unemployment in Teleorman county (%)

The unemployment rate (%)							
2007	2008	2009	2010	2011	2012	2013	2014
7.3	8	11.9	11	9	8.3	8	7.9

Source: National Institute of Statistics [2]

The rate of unemployment in Southern – Muntenia region highlighted a high peak in 2009, accounting for 9.5 %, followed by a slow decrease until 2014, when it reached 5.1 %, the same level like in the year 2007 (Table 11, Fig.12).

In Teleorman county, the average net monthly earnings (RON/employee) had recorded a continuous increasing trend in the period 2007- 2014.

Thus, in 2014, it reached 1,410 RON/employee, being by 67.6 % higher than in the year 2007, when it accounted for 841 Ron/employee (Table 12, Fig.13).

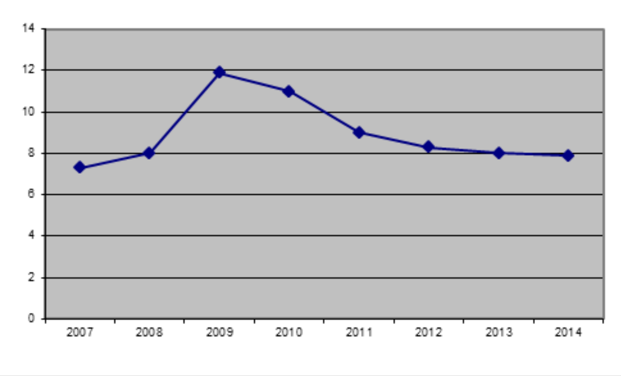


Fig. 11. Rate of unemployment (%) in Teleorman county
Source: own calculus and design.

Table 11. Rate of unemployment (%) in Southern – Muntenia region

The unemployment rate -%							
2007	2008	2009	2010	2011	2012	2013	2014
5.1	5.2	9.5	8.5	6.2	5.5	5.3	5.1

Source: National Institute of Statistics [2]

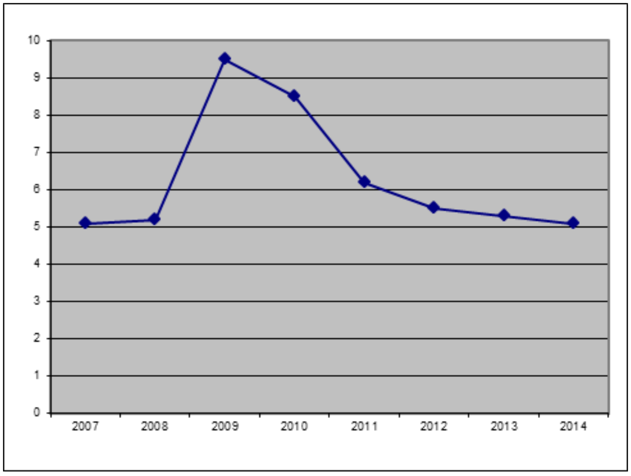


Fig. 12. Rate of unemployment (%) in Southern – Muntenia region
Source: own calculus and design.

In general, average net monthly earnings (RON/employee) increases when the amount of services and goods grows.

Table 12. Average net earnings per month (RON/employee) in Teleorman county

Average net earnings per month (RON / employee)							
2007	2008	2009	2010	2011	2012	2013	2014
841	1,100	1,122	1,124	1,192	1,272	1,351	1,410

Source: National Institute of Statistics [2]

At the Southern Muntenia region level, the average net monthly earnings (RON/employee) had higher values compared to the average net monthly earnings (RON/employee) in Teleorman county, reflecting that in other counties job offers were more attractive.

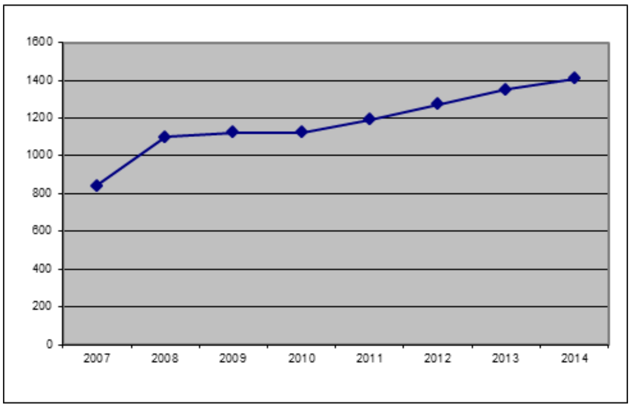


Fig. 13. Average net earnings per month (RON/employee) in Teleorman county
Source: own calculus and design.

In the Southern Muntenia region, the average net earnings per month increased by 66.6 % in the analyzed period, from 974 Ron/employee in 2007 to 1,623 Ron/employee in 2014 (Table 13, Fig.14).

Table 13. Average net earnings per month (RON/employee) in Southern – Muntenia region

Average net earnings per month (RON / employee)							
2007	2008	2009	2010	2011	2012	2013	2014
974	1,220	1,294	1,303	1,386	1,474	1,560	1,623

Source: National Institute of Statistics [2]

The characteristic of the average net earnings per month per employee is the continuous increase during the entire analyzed period from 2007 until 2014.

Average net monthly earnings had a sinusoidal trend during 2007-2014.

This indicator level increases when the number of economic agents increases and decreases when their number decreases.

In Teleorman county, the growth rate of the average net earnings per month recorded the highest values in 2007 and mainly in 2008, when it accounted for 30.8 %. In 2009, it declined to 2 % and then to 0.2 % in 2010. In 2011, it recovered reaching 6 % and in 2012 6.7 %. Since 2013 it declined again so that in 2014, it was just 4.4 % (Table 14, Fig.15).

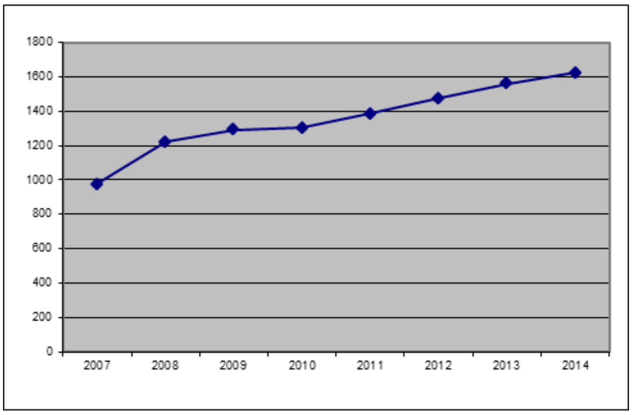


Fig. 14. Average net earnings per month (RON/employee) in southern – Muntenia region
Source: own calculus and design.

Table 14. Growth rate of Average net earnings per month in Teleorman county (%)

The growth rate of average net earnings per month (%)							
2007	2008	2009	2010	2011	2012	2013	2014
10.7	30.8	2	0.2	6	6.7	6.2	4.4

Source: National Institute of Statistics [2]

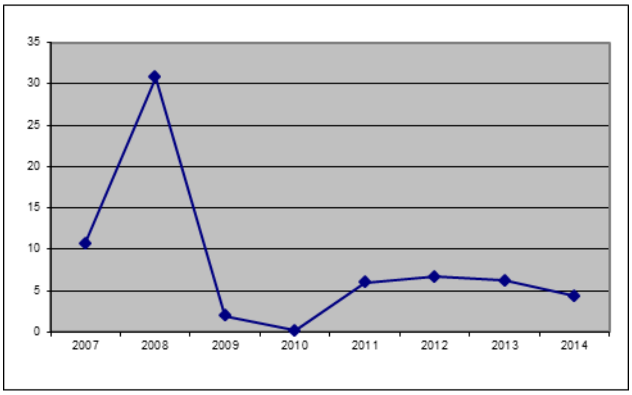


Fig. 15. Average net earnings per month in Teleorman county
Source: own calculus and design.

At the Southern Muntenia region, the growth rate of average net earnings per month had also a sinuous evolution in the analyzed period.

After an increase of the average net earnings per month from the year 2007 to 2008, then it suffered a major descend to 6.1 % and the lowest levle was recorded in 2009, 0.7 %. Starting with the year 2011, the average net earnings per month strive to grow, from 6.3 % to 6.4 % in 2012, but then it declined to 5.8 % in 2013 and to 4 % in 2014. Since 2009, this indicator has never recorded the level achieved in the years 2007 and 2008 (Table 15, Fig.16).

Table 15. Growth rate of average net earnings per month in Southern – Muntenia region (%)

Growth rate of average net earnings per month (%)							
2007	2008	2009	2010	2011	2012	2013	2014
16.7	25.2	6.1	0.7	6.3	6.4	5.8	4

Source: National Institute of Statistics [2]

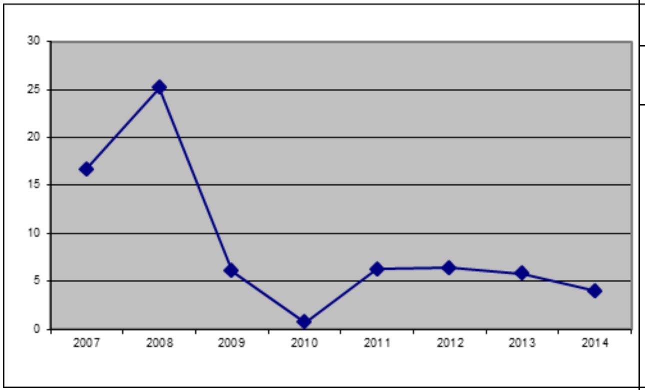


Fig. 16. Average net earnings per month in Southern – Muntenia region
Source: own calculus and design.

Teleorman is a county which has tradition in industry and agriculture. It is about the factory of chemical fertilizers situated in Turnu Magurele City, the factory producing bearings in Alexandria and wagons overhaul industry in Rosiori de Vede. Also, its fertile land represents one of the major assets playing an important role in the county's development.

Tabel 16. SWOT analysis regarding the economic dynamic – industry and agriculture [12]

Strong points	**Weaknesses**
-The existence of one of the most important chemical plants in the country; - A significant number of companies in the textile and clothing industry; -One of the most important companies producing bearings in the country; -Skilled labor available after repeated dismissals; -Strategic position for international trade through the acces at Danube in Turnu Magurele and Zimnicea; -High quality agricultural land; - Favorable conditions for the practice of fish farming - Danube port. -The active involvement of public authorities, competent in carrying out the process of informing the population in the agricultural sector; -The existence of a suitable food livestock base for animal sector development; -Forest regeneration programs; - Proximity to Bucharest; -Presence of foreign investors in the county.	Lack of manpower with higher education for industrial activities; -Lack of raw materials in Romania, thus further import costs; -Absorption of a low percentage of production on the market in Romania (approx. 25%); -Low level of research and lack of development applicability in private companies; -Old technologies - high production costs; - High pollution; -The high degree of fragmentation of land; -High level of use of agricultural machinery fleet; - Poor irrigation system; -Insufficient storage space for agricultural products; - The aging population; -Low number of employees in agriculture; -Increased reluctance for combinations of farms; -The average level of agricultural production.
Opportunities	**Threats**
Developing an active trade route to the Orient and Eastern Europe using the Danube River; -Diversification of existing industrial areas; -Attracting new investments in the agro-industrial sector; - Association of producers in agriculture; - Active labor exploitation by ensuring a continuous process of information and professional development; -Use of funding opportunities for rural development; -Border collaboration to attract investment; -Development of organic farming..	Increasing the number of employees made redundant as a result of automatization of the production process; -Exposure to global markets; -Migration of young people; -Increased competition from imported products; -Lack of recovery and promoting products traditional agricultural; -Legislative and administrative gaps on farmers association; - Climate change; -Labor shortages employed in agriculture.

Source: Sustainable Development Strategy 2010-2020 Teleorman County - APPENDIX to the Resolution no. 120 of 29 October 2010 [6, 7]

CONCLUSIONS

The goal of this study case was to highlight the evolution ratio between Teleorman county and Southern – Muntenia region that is belongs to. The topics intented to focus are presented as follows, together with a conclusion that will explain the ratio:

-Regarding the real GDP growth, while in the study of Teleorman county it was noticed a drastic decrease of GDP until the year 2009, a failure in coming back to the initial value and in the end the inability to stabilize to an average level, in the Southern – Muntenia region there were 2 peaks, high and low, followed by a return to the initial value.

-Concerning GDP/resident, in the both cases of Teleorman county and Southern – Muntenia region, there was a slight and constant increase of GDP value starting from 2009, the only difference being the value of GDP itself.

-Regarding the average employed population, the most important thing to mention in the ratio between Teleorman county and Southern – Muntenia region when it comes to average employed population, is the huge difference between the lowest point reached in year 2008. Beside this, both their evolutions are alike.

-Concerning the average number of employees, meanwhile in the Southern – Muntenia region it was noticed a radical decrease of the average number of employees until the year 2010, Teleorman county had a slow decrease, followed by a comeback to a constant value until year 2014.

-Regarding the unemployement rate, Teleorman county has differentiated by its slight increase in value, while Southern – Muntenia region has not followed these steps: it reaches a peak in the year 2009.

-Concerning the average net earnings per employee, the both compared areas showed a similar rate of progress, the only difference consisting in the final value reached in year 2014.

-Regarding the average net earnings per month, in Teleorman county there were found repeated variations of the value of average net earnings per month, while in Southern – Muntenia region it was achieved a constant evolution over 2007-2014 period.

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FACTORS INITIATING IMPLEMENTATION OF INNOVATION AND BARRIERS IN THEIR IMPLEMENTATION ON THE EXAMPLE OF ENTERPRISES IN PODKARPACKIE

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Abstract

The aim of the study was to assess innovation in enterprises in the province of Podkarpackie. The scope of work included in particular the determination of the factors initiating the process of implementing innovations and to present barriers perceived by their implementation. Innovation plays an important role in business management. It determines not only the pace, direction of development, competitiveness but also the forms and international structure of the business cooperation. The study shows that improving service quality, cost reduction and innovation have the greatest impact on improving the competitive position. The biggest impact on the introduction of innovation have customer requirements, the need to achieve a competitive advantage, ahead of competitors' actions (being a leader). The biggest barrier to the implementation of innovation is too long time to implement innovation and excessive bureaucracy associated with fundraising.

Key words**:** *innovation, the company, the economy*

INTRODUCTION

Innovations, as well as widely understood innovation activities of companies are of interest to both science and business practice. Innovation is one of the fundamental determinants influencing the development of the economies of individual countries, regions, businesses. They set the pace, direction of economic development, as well as forms of international cooperation [4].

Innovation is commonly new products or services that have been placed on the market. The first scientific definition of innovation, by Schumpeter, associated innovation with new combinations of factors. In this view, innovation is "the introduction of new products and new production methods, the opening of new markets, acquiring new sources of raw materials, and finally carrying out a new organization of business processes" [6].

The most common definition of innovation is considered now the definition contained in the Manual of Oslo, according to which: "Innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method or a new organizational method in business practice, workplace organization or external relations with the environment" [5]. The activity of enterprises mainly includes product, process, marketing and organizational innovations.

Innovation play an important role in business management. The process of globalization seen more and more clearly in the economy and the resulting intensifying competitive struggle, poses new challenges for businesses, forcing them to unconventional and innovative behavior. Betting on innovation is the basic method, which allows to keep the company on the market, and even strengthen its competitive position. Traditionally, the impulse to innovate were (and are) internal forces the company, and the result is a supply-side approach to innovation - the company's first work to produce something innovative and look for buyers for it [1].

Determinants of the emergence of innovation in enterprises are primarily to customer requests and the appearance of new technology on the market, for which you can find a variety of uses. Observation of the behavior of competition is also helpful [2].

The aim of the study was to assess innovation in enterprises in the province of Podkarpackie.

The scope of work included:

1. Characteristics of innovation in Polish enterprises,
2. Characteristics of surveyed companies,
3. Identifying the factors initiating the process of implementing innovations,
4. Presentation of the barriers perceived at innovation implementation.

MATERIALS AND METHODS

In order to determine the factors, which initiate the process of implementing innovations and presenting barriers perceived at their implementation a comprehensive study of innovation in selected enterprises Podkarpackie Province was conducted and the presented problem is part of the research. In the first stage of the study the current state of knowledge on enterprise innovation was analyzed. The analysis allowed the development of a questionnaire. The questionnaire consisted of three parts. The first part contained questions about test company, and in particular the organizational and legal form, the range of activity, the type of enterprise. The questions in the second part were related to the innovation taking into account factors including the introduction of innovation, funding, cooperation in the implementation of innovations. The third part was related to quality management systems and, in particular, implemented and quality management systems planned to implement, benefits and problems arising from their implementation.

In the second step studies were performed. Studies covered companies that operate in the region of Podkarpackie, which introduced innovations in enterprises and use of quality management systems in production processes and manufacturing. The research process was conducted in late October and November 2015. Replies were given by people who work in quality management in enterprise. The final analysis included correctly classified 20 completed survey questionnaires.

In the third stage the analysis and presentation of results using the computer program Excel was made.

RESULTS AND DISCUSSIONS

The level of innovation in Polish enterprises

Innovation in Polish enterprises is strongly linked to the size of the company tested in terms of number of employees. In Poland, the implementation of product and process innovations was least often in small businesses. Polish small businesses are characterized by the lowest technological innovation, and higher positions in terms of technological innovation are achieved by medium-sized enterprises and large enterprises that introduce new products or processes [8].

In 2011-2013, innovative activity was showed by 18.4% of industrial enterprises and 12.8% of companies in the services sector (compared to 17.7% and 13.9% in 2010-2012). New or significantly improved product or process innovations were introduced by 17.1% of industrial enterprises and 11.4% of companies in the services sector (in 2010-2012 respectively 16.5% and 12.4%).

Taking into account the type of innovation implemented:

- Product innovations were introduced by 11.0% business in industrial and 5.8% services sector (compared to 11.2% and 7.0% in the previous study period)
- Process innovations were introduced by 12.8% of industrial enterprises and 8.5% of companies in the services sector (compared to 12.4% and 9.1%),
- Organizational innovations were introduced by 8.3% industrial and 7.1% of business services sector (compared to 10.3% and 10.5%),
- Marketing innovations were introduced by 7.5% of industrial and 7.0% services sector businesses (compared to 10.2% and 11.1%).

Given the nature of the innovations in 2011-2013 the share of companies that have introduced innovations in the total number of companies is the largest in units employing more than 250 people; both in industry and in services by the companies introducing process innovations dominated (respectively 46.9% and 39.8%) [3].

General characteristics of the surveyed companies

The study was attended by 20 companies. Small businesses accounted for 35%, large enterprises - 30%, medium-sized companies 25%, micro-enterprises for 10%.

Taking into account organizational and legal form of surveyed companies it can be distinguished: natural persons registered to do business (30%), limited liability companies (30%), partnerships (15%), joint stock companies (10%), general partnerships (5%) , partnerships (5%) and limited partnerships (5%).

65% of the surveyed enterprises conducts production, 20% commercial activity, while 15% service activities.

Research shows that over 32% of companies operate in the domestic market, 26% are active on the local market, 23% of respondents work in a foreign market, 19% are active on the regional market.

The place and the importance of innovation in the enterprise

Research shows that for 35% of enterprises introducing innovations can improve the company's competitive position.

The biggest impact on improving the competitive position is due to improvement of the quality of products (50%), cost reduction (45%), as well as the introduction of new products (30%) and modernization of applied technologies (30%) (Fig.1).

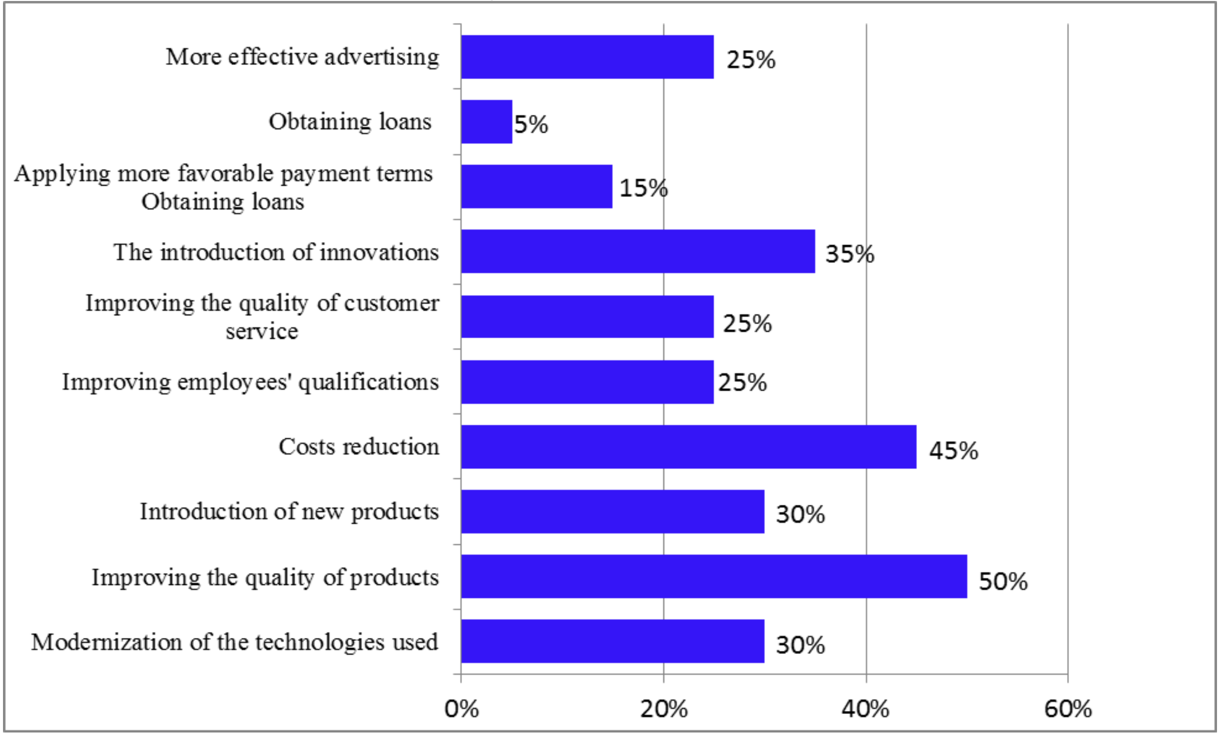

Fig.1. Improving the competitive position of the company
Source: Own calculations based on studies

Factors initiating the process of implementing innovations

The research shows that the main factors that influenced the introduction of innovations were the requirements of the clients (75%), being ahead of competitors' actions (35%), the need to achieve a competitive advantage (35%).

Less important were the requirements of suppliers (10%), the need to meet the legal requirements (10%) and the recommendations of consumers (5%) (Fig. 2).

Barriers perceived at innovation implementation

Among the most important barriers to innovation in the literature the following can be listed:

1. Market barriers associated with:
- Regional variation in demand,
- Strong competition in the market;

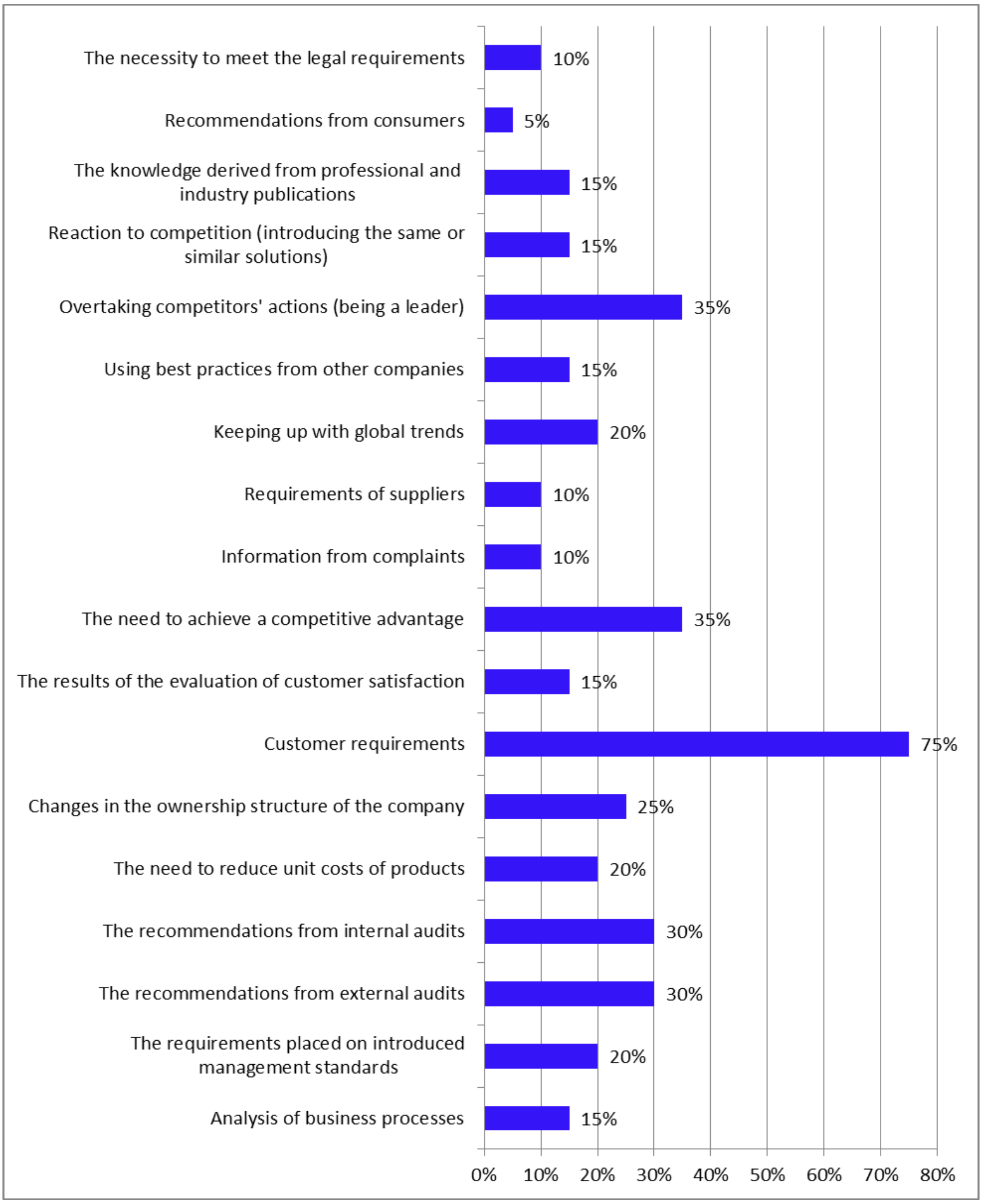

Fig. 2. Factors affecting the introduction of innovation in enterprise
Source: Own calculations based on studies

2. Financial barriers associated with starting a business, which include:
- The limited possibilities of obtaining funds for new projects,
- Financing for development,
- Leasing as a form of investment financing.
- The lack of reliable information about contractors,
- The tax system;

3.Barriers associated with government policies concerning:
- The introduction of legislation into force
- Unclear regulations in commercial law,
- Licensing of business,
- Regional policy;

4.Barriers related to the production, concerning:
- Factors of production,

- Employment,

-Technical infrastructure barriers and buildings policy;

5. Barriers related to access to information at the local level [7].

Research shows that the greatest barrier to innovation implementation is too long time to implement innovations (50%) and too much bureaucracy associated with obtaining funds (45%). The lowest barrier is the lack of proper infrastructure for research and development (5%) and insufficient protection of intellectual property (5%) (Fig.3).

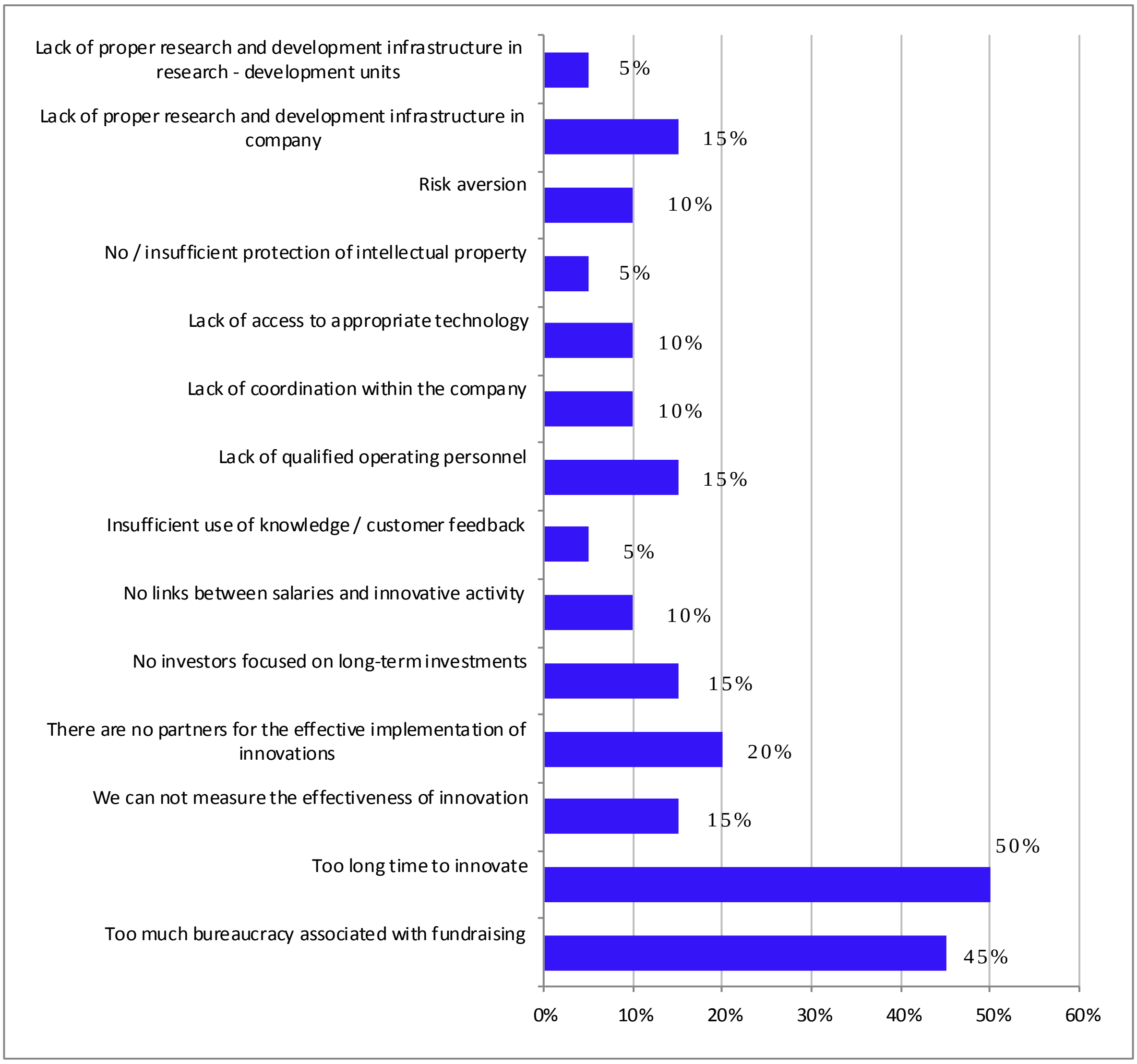

Fig. 3. Barriers perceived at innovation implementation
Source: Own calculations based on studies

CONCLUSIONS

In the light of growing competition, a huge momentum and a wide range of changes in the market, innovation is necessary in order to adapt to current requirements, and thus remain on the market. Only through innovation one can become a pioneer and leader in the given area.

Wanting to develop and maintain a competitive position in the domestic market, especially in the international market, Polish companies face the challenge of systematic innovation. They must use the advantage innovation gives. Unfortunately, despite the many years that have passed since the beginning of political and economic transition, currently the level of innovative activity undertaken by Polish enterprises is relatively low [4].

There are many motives for taking innovative activity by enterprise. In Poland the main drivers are: customer requirements, requirements of introduced management standards, the recommendations of the audits, the need to achieve a competitive advantage, keeping up with global trends, the use of best practices from other companies, overtaking competitors' actions (being a leader), the need to meet legal requirements.

Despite the desire to introduce innovation by Polish companies, their low level is mainly due to the existing financial barriers, insufficient funding for R & D (low level of expenditure on R & D remaining at the level of 0.6%), underdeveloped mechanisms for the transfer of research results into business practice [4].

Significant barriers also exist in the enterprise. These are mainly: too much bureaucracy associated with raising funds, too long time to implement innovation, lack of partners for effective implementation of innovations, the lack of investors focused on long-term investments, the lack of qualified operational personnel, lack of access to appropriate technology, lack of proper infrastructure for research and development in company and research - development units.

The study leads to the following conclusions:

(i)The biggest impact on improving the competitive position has improvement in the quality of services 50%, cost reduction of 45%, the introduction of innovations 35%

(ii)The biggest impact for innovation have customer requirements 75%, the need to achieve a competitive advantage 35%, ahead of competitors' actions (being a leader) 35%

(iii)The largest barrier to the implementation of innovation is too long time to implement innovations; such a situation occurred in 50% of the companies and excessive bureaucracy associated with obtaining funds 45%.

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