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C O N T E N T S

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SPECIFIC MANAGEMENT AND LEADING METHODS APPLIED TO BUTTERFLY TOURISM FOR 2012

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Abstract

In this paper are explained the most important management elements for managers and employees of a tour operator agency. The study showed in a concrete and realistic manner how a manager of a tour operator agency can lead, control, predict and determine the prospects utilizing a specific management method called dashboard. Given the competition in the field of tourism, Butterfly Tourism is trying to manage its business in a professional manner and offer attractive packages and favorable prices to its customers.

Key words: *dashboard, diagnostic, leading, meetings, tourism*

INTRODUCTION

Tour operators are concerned with the design and creation of tourism products and main objectives: market research and forecasting research, product research, development of tourism products, tourism pricing for those designed products.

The rapid development of tour operators generated changes in the management of companies and their operations become an imperative solid financial basis to enable them to pay the charter price. Consequently, some tour operators have been absorbed by large corporations with diversified activities, others have been associated with airlines and hotel chains, and others were involved in the development of tourist resorts.

At present, Romanians want complete offers increasingly focused on vacations which are guaranteed at the best value for money.

For this type of touristic package, a tour operator needs financial strength, experience, specialized teams, especially large volumes of tourists. A strong tourism trust means bargaining power with foreign partners, be they hoteliers, airlines and local tour operators. [1]

Tour operators are well-placed to support suppliers in improving their economic, environmental and social performance. As tour operators deal directly with potential customers, they understand their clients' growing demands for high quality and sustainability. They also often have access to technology and information that smaller suppliers may have difficulty obtaining on their own. Because tour operators deal with a wide range of different suppliers, they can more easily gather information on a variety of best practices and facilitate the sharing of experiences amongst suppliers.[2]

The coordination tool used by the manager of Butterfly Tourism is to establish deadlines at the begging of the day and check them at the end of the day. In another situation, if the tasks are more difficult, the verification will be done in couple of days.

The objectives of the future innovation and development are: market knowledge and competition, creation of many different packages and new technological advances continuously.

Management initiatives:

- It is very important that the tour operator to know the tourist market by conducting market

surveys and questionnaires to customers/potential customers.
-Creating and promoting new and different packages so that any customer who wants a vacation to find the right offer.
-Creating new packages from time to time to always be in line with market requirements.[3]

MATERIALS AND METHODS

The study was performed for a period of two months in 2013 within Butterfly Tourism, which is located in Bucharest. The processed data refer to the year 2012, analyzing in detail: specific managerial functions of Butterfly Tourism (management forecast – the prognosis and economic future), how to coordinate and how is applied the method of evaluation. Also the management methods adopted by Butterfly, namely: management method through meetings, by product, by diagnosis (SWOT analysis), by objectives and by dashboard are also described.

RESULTS AND DISCUSSIONS

Specific management functions

1) The forecasting function

The tour operator Butterfly Tourism doesn't want to expand the business by opening a new subsidiary in Romanian, considering this action an unnecessary promotion, because they have loyal customers and to make additional expenses it's not a solution. Besides this, Butterfly Tourism has no longer participated in the Romanian Tourism Fair in the last 3 years, because this requires labor and high costs. Last hiring occurred 3 years ago for the ticketing job.
The forecast stages are:
Stage 1. Awareness of the market opportunities, customer requirements and their weaknesses of the technological level
Butterfly Tourism would like to be a pleasant surprise for its customers by creating special offers and travel packages, and for this reason it pursues the market opportunities and most important customer desires. It wants to have unbeatable offers related to the quality and tariffs, to attract more customers and increase its own profit.
The wishes of Butterfly Tourism are to be in a permanent contact with its customers and their preferences in terms of travel packages. The employees use efficient and fast program, such as Amadeus program for booking flights and Hotelcon for accommodations.
Stage 2 – Goals Setting
• Increasing income by 20% by increasing the number of leisure and corporate customers.
•Increasing the number of customers by 15%.
Stage 3. Establish the internal and external premises before applying the plan:
Internal premises (2012):
- effectiveness of teamwork;
- managerial control on the employees and of accounting;
- training of employees in achieving the goals;
- more promotion;
- pleasant working environment.
External premises (2012):
- promotion made by customers and employees;
- existing prestige known by customers and collaborators.
Stage 4. Depending of the purpose, comparison the alternatives
Goals alternatives achievement:
• Massive and aggressive promotion;
• Salary reduction and increasing the working hour from 8 hour/day to 10 hour/day;
• Removing the employees days off and shorting the leave;
• Unfair competition;
• Reducing the quality of travel packages;
• Creating new different and special travel packages;
• Attracting new customers by offering them special and promotional offers.
Stage 5. Choosing the convenient alternative
Choosing the alternative depend by different criteria which doesn't affect neither the economic environment nor social one.
• Attracting new customers by offering them special and promotional offers;
• Creating new different and special travel packages.
The description of economic future

Butterfly Tourism came to the market with 4 exceptional travel packages, as follows:

Golf packages – it's a luxury package, because golfing is seen in our country as a sport for rich business people. If Romanians would know better this sport, would be many amateurs and would see that it is not an elitist sport. That is why Butterfly Tourism wants to promote this sport among people and meet the most demanding customers.

Safari packages – a visit to Kenya will provide the to a customer an unique experience, where he could explore the Amboseli National Park very close to the herds of elephants, black rhinos, buffalos, zebras, giraffes, gazelles and famous African feline. Tourists could see the most popular reserve of Kenya – The Masai Mara National Reserve - where they could capture wild creatures of the savannah. Besides all these wonderful things, the tourist can take a sunbath on the golden sands of Monsamba beach.

Spa and Wellness package – this package provides a lot of opportunities for customers to escape the stress of daily life, and allows him to enter into an oasis of calm and peace, where all that matters is their person.

Outlet shopping package – in this package are included: Belgium, France, Germany, Ireland, Italy and Spain. The tourist can shop from the prestigious brands and can enjoy the few days spent in the big cities of Europe.

These special packages were made 2 years ago, and in economic terms the results are exceptional. Regarding costumers, they can choose the ideal travel package created for every type of need.

2) The coordination function

This process is effective, because the manager can create a pleasant working environment and proper for each employee. Every employee knows what to do until the end of the day and this function can work very well in the long term economically.

One of the most important processes of coordination is: "communication". First of all, communication is achieved between the manager and employees, and secondly, communication is done between employees. Communication is very important for Butterfly Tourism because it's a starting key to function at maximum.

The communication system is realized via 2 ways: direct (meetings, open communication) and indirect (Outlook, Yahoo Messenger, by phone).

Butterfly Tourism uses different programs, and for that reason the information can reach at time between departments. Most used programs are: Outlook, Yahoo Messenger, Yahoo Mail which are effective both between employees and between employees and customers. It's very important that the exchange of messages between employees to remain archived, thus avoiding unpleasant situations between them and between Butterfly Tourism and its clients.

3) The control function

The control methods are composed of actions and decisions taken by the manager to ensure that the result coincides with the proposed result.

The control methods applied by a manager are:

- Quality control. This control helps to increase sales but in the same time helps to increase the number of customers which are choosing the tourism services of Butterfly Tourism.
- Accountant control. The manager establishes the budget and checks it periodically. Apart from this, the manager verifies from time to time (unplanned) the balance sheets to ensure that it is constant and no losses.
- Employees control. The manager is the one who selects, directs, develops and evaluates its employees, analyzing their behavior periodically.

The manager found it necessary to organize a team-building in November 2012 at Moeciu having as main goal: Development in a original way the relations between employees, combining teamwork with learning and relaxing.

The team-building was done at the end of the year (in November) so that employees can relax and enjoy a well-earned short vacation. They were guided to spend as much time together to highlight the fact that it is very

important to form a team, relieving their daily work visible.

Team-building conclusions:

- Employees have learned that the group dynamics is important for creating a pleasant environment and for increasing the efficiency of the agency;
- Employees have been fulfilled expectations with this team-building;
- The employees have become more responsible in fulfilling their activities and began to highlight their skills.

The team spirit and the team itself are 2 very important things for Butterfly Tourism and for manager, especially when the latter demand performance and special skills from their employees. The purpose of this team-building was to create a harmonious working environment, to integrate the skills, creativity and talent of employees.

Resulted the following benefits:

Benefits for manager:

- the increasing of economic efficiency;
- the non-financial motivation of employees;
- the creation of pleasant working environment;
- the reducing of stress.

Benefits for employees:

- 2 days spent in group, combining relaxation with intellectual stimulation;
- the discovery of new things about personality of the employees;
- improving the responsiveness to critical situations and risk taking;
- the reducing of stress.

Leading methods adopted by Butterfly Tourism

A. *Leading method through meeting*

The Butterfly Tourism manager regularly established meetings, in which he informed the employees about various and important things such as:

- various changes or announcements;
- provide information to certain areas;
- important decisions made;
- harmonize the working environment;
- investigate unknown future economic areas.

The meetings are periodically organized (monthly and year-end) or when is necessary to solve an urgent situation. Meetings are usually held at the end of day in order to have more time available.

The manager establishes some specific point that wants to achieve in the meeting session. After the discussions, the employees have the opportunity to ask him questions.

B.Leading method through product

The Disneyland –Paris offer contains 7 themed hotels (with 4*, 3* and 2*) and associated hotels (with 4* and 3*), but in the following lines, this method was applied for a single hotel – New York hotel 4*

Strategies – the covering of services after market barometer

The manager decided to create this new travel package at Disneyland Resort Paris in order to have the largest range of offers for existing or possible customers. The marketing department has investigated the market and decided to create this new offer and other travel packages including mainly the amusement parks.

The loyal customers of Butterfly Tourism were asked about their opinions regarding amusement parks from France and if they want to spend their holidays in this wonderful place. Most of them were excited about the idea of taking their children to Disneyland in holidays.

Price strategy and competitive tariffs

The tariffs established by agency for this offer (Table 1) are the most reasonable in comparison to other famous agencies. Butterfly Tourism wanted to provide quality services at reasonable tariffs, because he wants to attract a new niche of customers.

Table 1. Tariffs- Disneyland- Paris offer

Package	Tariff/adult-Standard room*	Tariff / child	
		0-6,99 years	7-11 years
2 days/1 night	209	free	88
3 days /2 nights	324	free	107
4 days /3 nights	443	free	122
5 days /4 nights	566	free	138
6 days /5 nights	683	free	153
7 days /6 nights	799	free	169
* tariffs starting from, with early booking reduction of 25% on			

Source: Butterfly Tourism, 2012

Offer availability related to the material basis, market demands and availability of service providers

Before created this offer, Butterfly Tourism had to take in mind some point such as material base, market demands and availability of service providers. In related to material base, the offer was created taking into account all the internal -such as exposure site an newsletter delayed- and external factors -lack of customers, cancelation of holidays, not paying on time the vacation-.

The market demands were clearly analyzed so the offer can penetrate the open market such as Disneyland Resort Paris.

The service providers were available from March 29 to November 7 in 2013, on which it can be seen that the period included both the high and low season, and you can see that the tariffs were very tempting to customers.

Strategy for quality of services

The services offered are of high quality, as all travel packages offered by Butterfly Tourism. The agency is aware that the quality services give rise to more customers and therefore they are responsible for all that happened from the moment of departure with Tarom (from Otopeni airport) until the return of client with Air France (from Charles de Gaulle airport).

The concept of tourism product

Usefulness: customer satisfaction;

Achievement: the offer was created to fulfill the desires of children to reach at Disneyland and to provide a great, amazing and peaceful holiday to their parents. To achieve this offer, were set out the departure from Bucharest, the airlines and the accommodation at the New York hotel 4*.

Marketing: Disneyland offer appeared on the agency's website, was send via newsletters, also promoted on Facebook and sold in the selling point from Barbu Delavrancea Str. – Bucharest.

Competitiveness: the offer had the most favorable quality – tariff ration compared to other tour operator agencies.

Finding the sales market

The Disneyland resort Paris is the perfect place for spending holidays both for children and for adults, being among the favorite destinations of tourists everywhere. This travel package offers the opportunities to meet the childhood favorite cartoons. Thus, they could meet Mickey Mouse, Minny, Pluto, Donald Duck and many other favorite characters. The offer was created to fulfill the wishes of young and to attract the adults in the wonderful world of Disney.

The control of ongoing services

The manager took care of tourist packages (accommodation + transport + meals) to be exactly what the customers requested. In the end, the customer most be pleased that he turned to Butterfly Tourism for choosing the vacation to Disneyland.

Knowledge of competitors and their potential

In was very important knowing the competitor market, because Butterfly Tourism was guided by this point in creating the Disneyland offer. The agency created this offer taking into account the opinions and needs of loyal customers.

C. Leading method through diagnostic

The leading diagnostic was achieved by using SWOT analysis as shown in Table 2.

Table 2. SWOT analysis - Butterfly Tourism

Strenghts	**Weaknesses**
- quality – tariffs ratio; -incoming; -seriousness, adaptability to customer requirements; -car rental in over 4000 locations worldwide; -member of IATA; -prestigious international partners; -diversification for the widest range of tourists; -presentation of the offer by website and Facebook; -personalization of services; -loyal cutomers.	-decreased of profit by offering discounts; -poor sales in low season; -new tour operators on the market; -poor promotion; -a single subsidiary.
Opportunities	**Threats**
-business expansion; -participation in Romanian Tourism Fair; -increasing the internet usage for purchasing travel services; -creating a special blog through which the agency publish articles about their offers and customers have the opportunity to share their experiences.	-economic crisis; -unfair competition from competitors; -decrease of population incomes; -increasing unemployment.

Source: Butterfly Tourism, 2012

D. Leading method through objectives

Objective: Revenues increase with 20% by increasing the number of leisure and corporate clients.

Action programme: Butterfly Tourism has used all the human and material resources required to achieve the specified goal (human resources: 6 employees and material resources as a: newsletters, publications on Facebook, phone messages, e-mail). It aims to increase the number of leisure and corporate clients showing revenue growth with 20%. Proceeds for 2012 was Euro 550,000 and spending was about Euro 375,000, resulting Euro 175,000 profit for Butterfly Tourismin the year 2012.

Methods used:

The methods used to achieve the target set have been: by leading meetings at different times and by means of staff motivation (praise, thanks, pleasant working environment). The manager knows that employees are those who most help to the achievement, and for this reason he is always ready to provide them with support and assistance needed to reach the desired results.

Instructions:

The objective was achieved by respecting the working legislation, without violating any rights of clients or co-workers.

E.Leading method through dashboard

The leading method through dashboard refers to the financial perspective, customer perspective, internal perspective and the perspective of innovation and development. The aim is that the management activities have a successful outcome for Butterfly Tourism.

Financial perspective

Objectives:

-to increase revenue with 20% (By online promoting, and offer to both directions of interest: corporate and private clients);

-to increase the number of customers (This is achieved by promoting new offers both established and attracting customers through website, Facebook and mouth to mouth method);

-promotion inexpensively (The Agency wishes to promote heavily website and Facebook page and that users can subscribe to newsletters to be always informed of new offers and discounts Butterfly Tourism Agency).

Customer perspective

Objectives:

- quality services (Butterfly Tourism puts great emphasis on offering for sale quality travel packages for all types of customers. It offers packages that meet all customer requirements, giving them unforgettable holidays!);
- over 13 years experience (Customers and potential customers put great emphasis on reputation and experience of the agency in this area. Therefore, Butterfly is well known as a tourist market in Romania and abroad.);
- staff very good and carefully (Employees have a decent outfit, follow a certain behavior and are always smiling to give customers a pleasant and family. It is a very important and decisive factor in the marketing of tourism products);
- correct prices (Butterfly Tourism provides quality travel packages at fair prices before putting all the comfort, safety and customer satisfaction).

Internal perspective

- professional staff, attentive and efficient (They are very attentive to all the customers who come into contact with the agency being responsible and showing professionalism in what they do. Employees work on schedule and going to end all the tasks they have to perform);
- a good manager (Organizes, leads and manages the entire business of travel agency to meet the objectives set);
- respecting the objectives (Both the employees and the manager wants to reach the objectives set out an important point for the agency);
- creativity (Butterfly Tourism seeks creation and sale of packages as different and varied to meet all requests received from loyal customers).

Perspective of innovation and development

- knowledge of the market and competition (Butterfly Tourism is very important to know the tourist market by conducting market

surveys and questionnaires to customers / potential customers);
- create many different packages with new elements (Creating and promoting new and different packages so that any customer who wants a vacation to find the right offer. Creating new packages are created from time to time to always be in line with market requirements).

CONCLUSIONS

Meetings within Butterfly Tourism are organized periodic (monthly and year-end) and ad-hoc when is necessary, they shall run usual at the end of one day.
For method leading by product, we characterized the package tour Disneyland Resort Paris. The manager decided to create this new package holiday to Disneyland Resort Paris in order to have the widest range of offers to existing customers or prospective customers.
The marketing department has been investigating the market weighing the possibilities of creating this new agency and offer travel packages to theme parks and other agency tour operator.
The loyal customers subscribed to newsletter Butterfly Tourism were asked about amusement parks in France and if they choose to spend their holidays in this place, voicing their opinions about open tenders. Most of them were excited about the idea to take the children on holiday to Disneyland. It was very important to know the competitive market because Butterfly Tourism was guided by it in creating Disneyland offer. The Agency created this offer taking into account the views and needs more loyal clients than competitive market.
The way the manager has established activities that aim to increase revenue by 20% by increasing the number of leisure and corporate clients to be touched, referring to the fact that Butterfly Tourism has used all human and material resources necessary to achieve the objective specified. Human resources manager used were the six employees of the agency, using material resources (newsletters, publications on Facebook, phone messages, e-mail), the Financial missing.
Following the completion of the dashboard, the financial perspective objectives were: increased revenue by 20%, increasing the number of customers, promote inexpensively. Initiatives:
 Promotion inexpensively. This is achieved by promoting new offers both established and attracting customers through website, Facebook and mouth to mouth method.
 Butterfly wants to greatly promote our website and Facebook page and that users can subscribe to newsletters to always be informed of new offers and discounts.
Customer perspective objectives were: quality service over 13 years of experience, trained and attentive staff, fair prices. Management initiatives:
 Put great emphasis on offering for sale quality travel packages for all types of customers.
 Provides packages that meet all customer requirements, giving them unforgettable holidays!
 Customers and potential customers place a lot of emphasis on reputation and experience in this field.
 It is a very important and decisive factor in the marketing of tourism products.
 Provides quality packages at fair prices before putting all the comfort, safety and customer satisfaction.
Objectives internal perspective: professional staff, attentive and efficient, effective manager , compliance objectives creativity . Management initiatives:
 The staff are very attentive to all the customers who come into contact with the agency being responsible and showing professionalism in what they do.
 Employees work on schedule and going to finish all the tasks they have to perform.
 Organizes, leads and manages the entire business to meet objectives.
 Both the employees and the manager want to reach the goals set for the agency is an important point.

 Butterfly Tourism wants creation and sale of packages as different and varied to meet all requests received from loyal customers.
The manager and the employees are always in step with the progressive technology and are constantly informed about new programs in terms of booking.

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NEW DETERMINANT FACTORS OF CHANGE MANAGEMENT IN THE HOSPITALITY INDUSTRY

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Abstract

The factors that we took into account the following important elements: for goods and capital (brand promotion, reliable predictions against risk factors, knowledge capital, intangible values for hotels), for health and safety (the easily with which diseases can cross oceans and borders and multiplying rows of old and new infections, some impossible to treat, strict control of food and non-food products entering in the hotel), for new management (planning education and training process in hospitality industry, demographic problem, New trends in the workplace). One of the most dramatic changes in this industry is the way to sold products and services for public hotels. New technology, development of hospitality industry and social problems are very important, also in this process of change management to hotels.

Key words: *capital, change, factors, hotels, management, new*

INTRODUCTION

Inside the hospitality industry, "financial engineering" of the past 20 years - mergers and acquisitions, corporations that invest in real estate, estate liquidations and long-term management contracts - provides little indication of how companies will produce future value in the context changes in the industry. The industry needs to show more foresight and a more complete joint financial management and strategic.[3]

Regarding globalization and long-term economic trends, there are six factors that govern globalization, economic dynamism and growth, namely political pressures to increase living standards, improved macroeconomic policies, deregulation/ liberalization of international trade, increased trade and investment, the spread of information technology and private sectors more and more dynamic.[2]

The focus on adding value set remodels leadership skills that prevailed for so long, while technology changes the nature of the business skills needed to compete, learning, nature of work and the worker - all requiring a new type of managers and new types of management in world hotels.

Using assembly technologies and data retention hotels will give you the opportunity to store and use information about consumers to determine their customers' enduring values, sacred loyalty and increase its market. Therefore, the model "segment-of- one" or relationship marketing, a personalized approach, will replace the old mass marketing.[1]

While information technology is high -level management, the importance of responsible with information or technology will inevitably increase, although it remains to be seen whether it will influence key decisions on competitive strategy. [1]

MATERIALS AND METHODS

This paper analyzed the factors that determine the change management in the hotel industry worldwide. The studies concluded that the most important factors who are involved in change management are: goods and capital, health and safety, new management, marketing, distribution and control capacity, technology, development, social problems.

RESULTS AND DISCUSSIONS

We found 7 factors who are implicated in change management in the hospitality industry worldwide. These factors are:

a) Goods and capital;
b) Health and safety;
c) New management;
d)Marketing, distribution and control capacity;
e) Technology;
f) Development of hospitality industry;
g) Social problems.

a) Goods and capital

Global capital flows execute to global level, enormous pressure on managers to increase the value of them. Investors who are not satisfied with the profits will send money to more profitable alternatives. Their assessment will be based more and more on the earning potential of companies.

In other words, firms will be judged on their ability to generate cash flow in the future. This means that hotel managers will need more skilled in anticipating future functioning and reliable forecasting in an environment where there are more and more risk factors.

In contrast to the traditional view that markets do not understand - and therefore underestimate - the hotel industry, the industry analysts argue that the industry did not understand how markets appreciate the value and make a number of observations support this view.

Brand promotion is a competitive method widely known - is increasingly judged on power to generate future capital flows. Given the increasingly standardized offerings of products and services of major brands, financial markets using different standard based on measuring the value. For example, the "knowledge capital" group of employees, who gathered at the skill, experience and their preparation, plays a strong differentiating factor.

Reservation systems and loyalty programs and marketing gaining traditionally praised hotel companies as essential elements of the mark are weak now distribution channels on the Internet.

Other manufacturers of operating systems, which after using the opportunities offered by technology faster than the industry, now competes with her capital investment.

In an era in which new models of price fixing Internet influenced reduce physical attributes of a state hotel products and customers are more interested in " experience " than charging for room and pleasant conditions , industry is forced to invest more in services and experiences called " intangible assets " .

In turn, this situation of multiple challenge for the industry, first of all the need to:

- To ensure investors that these "intangible assets" are able to generate significant capital flows due to competitive methods very efficient company;
- Assess the profit that they will also make investments in intangible values , to estimate their lifetime and possible variations in the flow of capital brought by each;
- To recruit, retain and remunerate staff with the necessary skills required to provide superior customer service, especially in a difficult labor market;
- To invest in technology systems to optimize service.[10]

b) Health and safety

Increasing concern to society on matters of health and safety can be attributed to several global trends, including:

- The difference between poor and rich in the economic and information that motivate those disenfranchised them to handle problems;
- Increased incidence of food due to their transportation once on the place of origin, especially when infrastructure is inadequate (water and sanitation);
- Risk exposure they bring, extreme sports and adventure tourism;

The implications of these trends in the hospitality industry will be felt in the form of increased pressure from various categories of clients:

- Pressure to provide a safe environment for customers;[9]
- Insurance company attempts to minimize the risk to protect the payment for liability;
- Consumer pressure on hotels to provide accurate information on the intended crime

and the prevention and precautionary advise potential visitors.

In turn, this may require new forms of cooperation with the police and news agencies and extend even to gather information in areas where the government's anti-terrorism measures are ineffective.[5]

If the industry does not act on this threat preventive potential hotel provider may lose control of the sizeable supply of products and services.

Overcoming them will require investment in training customers and employees, managing tighter food supply and encourage cooperation with external agencies.[7]

c) New management

Across the industry, two challenges are likely to monopolize the attention of hotel managers in the future:

- Labor shortage , due in part to competition from other segments that offer attractive working conditions , plus , in the developed world , the demographic (large number of those who reach retirement) and in developing countries , in addition to training at an inappropriate level;
- Funding and planning education and training process - especially the transition from the old model, the leadership has now been educated to a student-centered approach.[9]

The problems workforce become more complex in the age of information, with the features, on the one hand, a customer with knowledge of technology and the Internet that is more informed and more demanding, and on the other hand, a new type of worker and intellectual skills lead to higher claims.

The new type of worker will not tolerate driving style based on command and control in the industry today. He claims to be treated as a free agent in relation to the employer, to be valued and rewarded for their knowledge and skills to be given ongoing opportunities to learn and grow and be conducted with integrity and fairness.

New trends in the workplace can be summarized as follows:

- A growing shortage of skilled labor, especially "with knowledge workers "and demanding higher levels of technological skills of all employees;
- Less strict hierarchy in which managers develop their style of "first among equals "and management positions is based on competence , not seniority;
- Increased pressure on all members of the firm to add value generated by the capital markets;
- Application of technology in all aspects of human resource management - recruiting, training, record keeping, compensation and performance evaluation;
- Training tools using multimedia components to help employees acquire multiple skills. These tools will not only be available but will be required of members of the workforce.[11]

Technology will accelerate change much due to education and training, both in form and in content, that:

- Development of a new body of knowledge based on relevance and need;
- Emergence of virtual universities will compete with traditional schools;
- Adapting education to individual student needs;
- A group of students with clearly defined tastes, seeking, as buyers achieve their own goals of self-development;
- The emergence of a "super class" of academics sell their expert knowledge in many forms from individuals, schools and companies around the world;
- A move from a curriculum based heavily on skills, with strong operational content, towards a general management focus, with added value in its core;[12]

d)Marketing, distribution and capacity control

Electronic distribution, especially the expansion of electronic commerce is revolutionizing the way consumers learn about, evaluate and pay accommodations and services. In the field of marketing, this trend is characterized by:

- Transparency, which gives customers more power, less choice in evaluating the price and value;
- A switch from brand-based marketing based on the destination;

-Marketing one-to-one, in the transition from broad segments of consumers for personalized interaction with the assembly and retention;
-The notion of "enduring value to the customer";
-New channels of marketing (cell phones), associated phenomena, as "Permission marketing";
- "Zero tolerance level" marketing messages that fail to meet the high standards of integrity and honesty of customers - and denouncing the Internet;
-Multiplying government agencies and consumer groups to enforce standards;
- Multiplication of distribution channels and smart personal software agents acting as a filter between the buyer and the merchant;
- Intensifying the challenge of fixing the price as hotel service providers are required to generate cash flow by "intangible assets".[4]
Although some companies have successfully formed a portfolio of intangible assets for competitive advantage (Disney hotels, Ritz Carlton and For Seasons, Peninsula), the use of these assets gives rise to the following problems:
- Objective assessment of these investments, since they tend to have a short life, are easily copied and linked to customer perceptions;
For marketing function, this requires:
- Rethinking identification, analysis and evaluation of the client;
- Efficient market research and estimating the duration of the customer in an online world where customers use personal agents acting as a filter;
- Replacing the present corpus of knowledge and how it is transmitted professionals of tomorrow in the field of marketing;
- Managing multiple distribution channels that force managers to focus on managing distribution costs;
- Establishing a business model for marketing function, in the choice of marketing activities. For this you will need more precise estimates of revenues and costs associated with intangible assets in today's hospitality offer a better risk analysis and more objective in evaluating all options for marketing.
- Thoughtful alliances in an environment characterized by multiplication of distribution channels, suppliers and intermediaries.

e) Technology

As long as advancements in technology continue to accelerate as a result of convergence estimates, communications and software, this force will continue to have a major influence on the future of the hotel industry. The following factors will play a role:
- Availability of non-stop, real-time is needed with regard to access to information and transactions. Consumers demand everything to be at hand and be able to take action immediately in anytime, anywhere and under the conditions fixed by them.
- Firms will invest more than a multimedia approach to transactions with customers, leaving " legacy systems " and seeking to combine distribution system , marketing and management functions and operations phenomenon Internet / Intranet / Extranet in a single architecture that will improve the management, profitability and customer relations . No doubt it will cost more, not only money but also time and labor required for conversion of systems and training.[4]

f) The development of hospitality industry

This is new in the family forces IH & RA identified in the first White Paper. World Tourism Organization, the World Bank and some other international organizations have set this as a priority and governments around the world have urged stronger efforts in this area.
The following key points should be considered the leading hotels in the administration of next dimensions:
- Government influence is most strongly felt through the planning and development regulations, laws etc funding. Ironically, government regulations tend to be the poorest in developing areas of the world where fragile environments are most threatened.
Lack of media hardness is, however, included in long-term interest of the hotels;[3]
- The companies should be aware of its responsibility towards the possible development to maintain the hotel industry and tourism in general. Besides justification

that using limited resources (land, water) must be integrated into the principles of operation and design;
- Green business strategies should at first, to define and communicate ecological way of thinking within and across the organization.
-Economic and monetary supporting ecological characteristics and possible development support should be clearly communicated maintained and understood all over the sector.[10]

g) Social problems

Since the hospitality industry as part of the travel and tourism is one of the largest industries in the world in terms of contribution to gross global output and employment generation receives more attention to leadership issues in social responsibility. Given this impact on economic development, including job creation, it is anticipated that the industry will be called upon to deal with the difference between the so-called people "money" and "no money".
The need to deal with macro issues is a unique challenge for a fragmented sector characterized mainly by small and medium enterprises mainly concerned to remain profitable enough to remain in business. Key elements include:
- Issues related to urbanization and the creation of "megacities".

CONCLUSIONS

A.Heads of corporations will support prevention programs and crisis management to employee training regarding the procedures that warning and client protection.
B.A major challenge for the industry will be the emergence of alternative sources of information about their safety - for example, national companies that make independent assessments and recommendations.
C.Emphasis on thinking skills, decision-making capacity, creativity and the way in which hotels use technology to compete.
D.Maintaining constancy necessary for all intangible assets, primarily because they depend on the level of services that require skills that are not easily available in markets where labor is restricted;
E.Issuing a credible and consistent marketing message to customers in an increasingly transparent where there is a second chance;
F.Fixing the price of these assets in order that market researchers will have to develop a valid and reliable means a network of one- to-one marketing.
G.While e-commerce is growing exponentially, rules of conduct, principles guidelines, laws and tax issues are only beginning to receive attention government, consumer interest groups and technology companies around the world in an effort to impose a regulation of cyberspace.
H.In the competition for capital, management will realize that adding value to assess the size of the investment in technology is among the most complex challenges and that it will add the need to ensure high levels of technological skills a market where labor is reduced.
I.Regulation by governments and international organizations is increasingly influenced by the communities and local groups directly involved in building policy. If it feels that the local environment is adversely affected, hotels and restaurants can expect and other challenges this level.
J. Hotel or hotel company 's role in the wider community and individual concern for issues of public and private space that can mobilize public opinion against corporations that do not comply with evolving social protocols ;
K.Adding that media problems where no smoking, education about alcohol and how the industry uses its supply chain.

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BIOLOGICAL WAYS OF STRUGGLE AGAINST WATER EROSION ON ARABLE SLOPES OF THE CENTRAL RUSSIA

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Abstract

In article are proved a choice of ways of struggle against water erosion of arable slopes on the basis of harnessing the potential of bio-based agrocenosis. Efficiency of use long-term lupine in quality green manure and phyto-ameliorant on eroded soddy-podzolic sandy soils of the Vladimir area is shown.

Key words**:** *arable slopes, a water soil erosion, green manure, long-term lupine*

INTRODUCTION

Strengthening of water erosion is caused excessive of plowed agricultural lands and slopes. About 60 % of the fields have been involved in Russia in the end of last century in an arable land, and in world agriculture only 29%. Insufficiently differentiated on elements of a relief structure of areas under crops, a ploughed land along slopes, long vulnerability of soil agricultural crops in the absence of crops in the spring, in the autumn and in pure steams, loss humus as a result of destruction and washout of an arable layer and an alluvium melkozem, consolidation arable and cultivator horizons running systems of cars - all it promotes progressing and ecologically dangerous development of water erosion and demands immediate measures [1].

The most widespread kind of degradation of soils in the world is water erosion. Formation of a superficial drain begins at biases 0.5-1 °. Such soils on arable lands of the Russian Federation were about 32 million in hectares or 27 %. On arable slopes more than 1 ° - 45.5% of an arable land, 34.0% of natural haymakings and 49.4 % of pastures earlier have been placed. Thus, the superficial drain causing erosion and accelerated degradation of an arable land, had been captured 72.5 %, and in the Vladimir area - more than 50 % of an arable land [2].

Now the ploughed land along slopes and small ploughing was extended. The structure of areas under crops is insufficiently differentiated on elements of a relief. As a result of the strengthened mineralization, wash out nurturing soil and oozy fraction decreases soil humus, there is a consolidation arable and subsoil horizons running systems of cars that causes progressing and ecologically dangerous development of water erosion.

According to the minimum law, the fertility and a production efficiency is defined by not so much average indexes of properties of soils, level the agricultural technicians, brought fertilizers, etc., how many the factor which is in a minimum. Such factors on a slope are the moisture and separate biogenic elements more often.

At repeated reduction of application of organic and mineral fertilizers in the agricultural enterprises root, stubble remains the rests the role of bioresources has sharply increased in reproduction of organic substance and food elements in arable soils, and also in balancing them in agro-technogenical circulation. Quantity stubble remains depends on structure of specific structure of cultures of a crop rotation, soil-climatic and weather conditions, level soils, a lay of land, an exposition and degree loss soils of a slope, a complex agricultural technicians in system of agriculture and

finally from size of a biological and economic crop of cultivated cultures.

In connection with sharp deficiency of manure and composts (according to the Ministry of Agriculture the Russian Federation is fertilized now by them no more than 7.5% of crops in the agricultural enterprises) and the terminations of use of peat on fertilizer gets increasing value mobilization of vegetative resources directly on a place of their manufacture. Their use, especially at copy-reclamation agriculture, can compensate unproductive irrevocable losses humus and food elements on the arable slopes subject to water erosion. Traditional fertilizers should be applied first of all on the best, instead of eroded the earths. Especially it concerns applications liquid dung on slopes: it can be used only at presence of techniques for intrazonal soils entering to prevent washout of liquid fraction.

MATERIALS AND METHODS

On eroded slopes a recoupment of organic and mineral fertilizers much more low, than on plakors and slopes to 1.0-1.5˚ [3]. Besides, vegetative bioresources as a source of organic substance and cindery elements of a food many times more cheaply also have advantages before traditional fertilizers:

-possibility of realization of vegetative bioresources (long-term grasses, straw, green manure, etc.) are practically inexhaustible, as they annually are reproduced and are insufficiently used now;

-vegetative bioresources, especially with the assistance of bean cultures, allow to involve in agrobio-technogenic circulation of substances biological nitrogen at the expense of a plant-owner, tubercle bacteria and endotrophic mycoriza of roots in quantities to 200-400 kg of hectares, and also remote elements of a food from a soil profile;

-possibility of system fertilizer of remote fields and together with it of operative use of intermediate culture green manure on country and farmer sites on which receive more than 90 % of a potatoes and 80 % of vegetables of the country is provided;

-more than 90 % of the crop (a biomass of green manure) it is formed at the expense of photosynthetic activity of agrocenozes at its annual reproduction. Thus there are ample opportunities of increase in a vegetative biomass of fertilizer on years and crop rotation;

-debris of plant and green manure are ecologically safe fertilizers and their use, at the organization of effective advertising, will allow to compete to the imported foodstuffs successfully.

Forage crops are not only a source of manufacture of forages, but also preservations of fertility of soil, especially slopes, and also ecological stability of environment form a basis biologization of agriculture. Thus humus losses at cultivation of forage crops at the expense of receipt of the vegetative rests (reddish, roots) are compensated to 49 %, and the general deficiency humus decreases to 640 kg/hectares of an arable land [3].

RESULTS AND DISCUSSIONS

According to VNIIOU research results, the green lupine biomass is more favorable for using, first of all, on forage, instead of on fertilizer. However presence in the Russian Federation more than 0.8 hectares of an arable land per capita against 0.2 hectares in world agriculture creates possibility of maneuvering by the area, and also uses low the earths under green manure steams [4].

Also on slopes it is expedient to sow long-term legume-cereal grass mixtures.

Important special attention to give to cultivation green manure, high which transportability of seeds and cheapness of delivery to remote fields provides economy at the expense of decrease in expenses for Petroleum Products and transport. Possibility of system fertilizer of remote fields, and also an effective utilization of intermediate cultures on homestead, country and farmer sites where it is made about 80 % of all volume of a potato and vegetables is thus reached [5]. It is necessary to consider, that

the vegetative rests and green manure are ecologically pure fertilizers.

The landscape approach to working out of optimum structure of areas under crops assumes fuller use of bioclimatic resources of an agrolandscape by cultural plants, on the one hand, and realization medium resoiling features of cultivated plants, with another. Area differentiation on slope elements, fertility of soil, it loss and to a ploughed land direction should be fixed by system (skeleton) of protective afforestations and copy-reclamation agriculture placing of crops on field horizontals.

In VNIIOU on a slope of a southwest exposition 3.0-3.5˚ carried out researches on working out agro- phyto- land reclamations receptions of increase of fertility slope soddy-podzolic sandy soils on the basis of use long-term lupine in landscape agriculture. Simultaneously within four years carried out researches on studying of influence of elements of an agricultural landscape on efficiency agrocenozis and fertility of soddy-podzolic soils.

As a result of researches it is established, that relief elements influence efficiency of cultures of a crop rotation more strongly, than anthropogenous actions in agriculture system - agrotechnical, resistance erodible and agrochemical. Distinctions on productivity of grain crops on relief elements in adverse years on humidifying reached six - fold size. In the best parts of a slope efficiency of soils decreased in 1.6-1.8 times in comparison with a watershed and a flat top part of a slope.

For streamlining of directions of a ploughed land and differentiated use of fertility of soils of elements of slopes high agroecological efficiency of copy-reclamation agriculture placing of crops in a combination to application green manure - long-term lupine on fertilizer is revealed. Positive influence of this complex on efficiency of cultures, indicators of soil fertility, agrophysical properties of soil, stocks of productive moisture in vegetation of plants is thus established.

It is established also, that stocks of productive moisture in soil from May till September were minimum at a control longitudinal ploughed land and interrow processing at corn cultivation. Productivity of green weight of corn in comparison with the control in crops across a slope authentically increased on 10.4-11.6 %. The increase of a crop of barley at the copy-reclamation agriculture organization of a slope territory reached 0.6-0.9 tones on the hectares, or 15.5-18.1% in relation to the control. The best maintenance with moisture of the crops located on a watershed and the top part of a slope, speaks the absence of a drain raised by the maintenance of clay, and also to relatives bedding the waterproof horizon (Table 1 and 2).

Table 1. Influence of elements of a slope on productivity of grown up cultures, t/ha

Experience variant	Winter wheat (2001)	Barley (2002)	Winter rye (2003)	Corn on a silage (2001-2003)
Placing of crops along a slope				
The control	2.8	1.1	1.6	11.5
Placing of crops across a slope				
Watershed	3.2	2.0	2.5	19.0
Average part of a slope	3.0	1.7	2.6	14.7
The bottom part of the slope	3.0	2.0	2.6	15.8
The least significant difference $_{05}$ tons/hectares	0.08	0.3	0.42	3.0

In adverse on deposits years the herbage long-term lupine grew with weed vegetation. Therefore lupine it is necessary to combine with other cultures steadier against a drought and, first of all, with long-term cereal grasses. According to A. N. Kashtanov and V. E. Javtushenko (1997), long-term grasses reduce erosive losses humus and biogenic elements in 2-3 times in comparison with grain crops and in 10 times in comparison with pure steam. Grasses practically stop water erosion and by that create a basis for ecologically safe and biologically balanced system of agriculture on arable slopes. In adaptive crop rotations and outlet fields on eroded slopes it is recommended to sow weathers difficult highly productive and steady against

anomalies grass mixtures, calculated on long use in agriculture.

Table 2. Stocks of a productive moisture in soil, mm

Experience variant	Culture	Layer of earth, cm			
		0-60		0-100	
		May	August	May	August
The control	Winter wheat	42.4	85.8	54.7	100.8
Watershed	- « -	57.5	88.3	116.4	170.9
Average part of a slope	- « -	81.0	84.2	134.0	161.0
The bottom part of a slope	- « -	40.5	87.0	78.4	169.0
The control	Corn on a silage	55.2	58.2	124.6	118.6
Watershed	- « -	60.7	73.7	113.1	134.8
Average part of a slope	- « -	66.0	68.7	126.0	124.0
The bottom part of a slope	- « -	34.0	75.4	130.0	136.1

At formation competitive fodder agrocenosis it is necessary to consider fuller economic-biological features of long-term bean and cereal grasses.

CONCLUSIONS

Infringement of balance of biogenic elements in agriculture conducts not only to reduction of production and deterioration of its quality, but also to decrease in stability of agricultural landscapes. There upon indemnification of deficiency of nutrients at the expense of maximum use bio resources and mineral and organic fertilizers should be considered as ecologically necessary problem, and «object of regulation of economic-biological circulation of nutrient substances in agriculture and animal industries becomes farmland has in general» [6].

The landscape approach to working out of optimum structure of areas under crops assumes strengthening of differentiation of an arable land for the purpose of fuller use of bioclimatic resources of an agrolandscapes by cultural plants, on the one hand, and realizations features of cultivated kinds of plants, with another.

Area differentiation on slope elements, fertility of soil and to a ploughed land direction is fixed by system (skeleton) of the protective afforestations which participation increases with a steepness of a slope and degree destruction of soils.

Thus it is necessary to consider, that with increase in a corner of a slope relative density long-term legume-cereal grass mixtures should grow.

Grass planting in crop rotations it is necessary not only on slopes, but also on plakors, however the importance of grasses repeatedly increases on slopes where they can and should prevent a soil erosion.

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THE ECONOMIC IMPORTANCE OF THE EPIGEAL FAUNA IN THE CORN AGRICULTURAL ECOSYSTEM IN OCNA SIBIU (SIBIU COUNTY) IN 2012

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Abstract

The arthropods have the role of biologic indicators, of diagnosis instruments regarding the negative effects of the human intervention in the structure and functioning of the agricultural ecosystems. Their presence or absence, the growth or lowering of their populations in the agricultural ecosystems can indicate the state of health of these systems and their good functioning. The aim of our researches is establishing the fauna structure of the community of arthropods at the soil level in the corn agricultural ecosystem in Ocna Sibiu, (Sibiu County); the characterization of the communities of invertebrates under the aspect of numerical abundance and of that of relative one; framing the entomologic fauna into a beneficial or pest one, the identification of the culture technology for the researched area. Regarding the applied researched methods, they were as follows: the using of pitfall traps (Barber traps) that were at the level of the soil as well as the method of direct collecting of the fauna from the plants. As a result of our researches there was established the taxonomic and quantitative structure of the collected fauna through the methods of pitfall traps (Barber traps) in Ocna Sibiu during 2012; there were identified 13 taxonomic groups. From the total of the collected agricultural fauna gathered by the help of pitfall traps in Ocna Sibiu locality there were identified 51 species of insects from which 30 were beneficial ones and 21 pest ones, the dominating order being Coleopteron with 35 species. The establishment of the group of arthropods, especially of the entomologic fauna, beneficial or pest indicates the equilibrium or the disequilibrium state from the researched corn three field systems. The ratio between the two types of fauna permits choosing the optimum method of maintaining the equilibrium between the species of the system and applying those measures of management in order to affect less the system in its assembly and to determine the growth of the production.

Key words**:** *biodiversity, corn, fauna*

INTRODUCTION

The arthropods belong to the group of organisms best represented on the entire planet that could be met in each and every terrestrial habitat playing a major role in the evolution and maintaining of the biocoenosis [13]. The arthropods have the role of biological indicators, of diagnosis instruments regarding the negative effects of the human interventions in the structure or functioning of the agricultural ecosystems. Their presence or their absence, the growth or lowering of their populations in the agricultural ecosystems indicates the state of health of the system and good functioning [3]. Among all the arthropods the insects represent the base in the majority of the trophic chains. These pollinate more than a quarter of a million of flower species; without these pollinators it could be lost a third of the entire food. These insects recycle the nutrients enriching the soils and decomposing the animal rests and dejections. The pest species are to be blamed for the enormous annual economic losses but the losses are less than the benefits bring by the beneficial species. [13].

Our researches studied the corn because this represents the main field culture in Romania, with surfaces in all the areas of the country. Researches regarding the invertebrates from corn, mainly the entomologic fauna were concretized in our country in a serial of studies from which some regarded the invasive species *Diabrotica virgifera virgifera* (the western worm of the ground roots), [1, 2, 5, 7, 8, 9, 17, and 23]. The other studies reflect the interest for *Tanymecus dilaticollis*,

[12, and 22]. Few researches in our country were interested on knowing the fauna structure composing of a group of insects in the corn agricultural ecosystem [4, 6, 10, 14, 18, 19, 20, 24, and 25].
The aim of our researches was in sampling and identifying the biodiversity of the epigeal fauna that was present in the corn culture in Ocna Sibiu locality, Sibiu County. Our option for this agricultural ecosystem was determinate by the fact that this raised two major problems: the mono culture that is practiced in the area and the apparition of the of the invasive species *Diabrotica virgifera virgifera* L. (the western worm of the corn roots). In this way as a result of this study there were identified a series of pest insects but also beneficial ones for the corn culture.

MATERIALS AND METHODS

The interval when the researches took place was April – October 2012;
The locality where the researches took place was Ocna Sibiu (Sibiu County). The shape of the plot taken into study was a rectangular one having a surface of 2 hectares;
The main sampling method in the researched area was that of pitfall traps at the level of the soil, in which as an attractant and a preserver was used a solution of formaldehyde 4% (Photo 1). There were put 10 pitfall traps (Photo 2). The sampling time for such a trap was 48 hours from the moment of installing. The biologic material was collected in special little bottles, in alcohol, one for each and every sample; then followed the study in the lab.


Photo 1. Barber trap (original photo)

Photo 2. Ocna Sibiu locality – Example of Barber traps arrangement

There was also applied the method of direct collecting. This was a qualitative one that allowed us a more thorough analysis regarding the interrelations hostess plant – phyitophaguos insect or between the latter one and other beneficial species in the bioecenosis;
The technology used was of an intensive type (Photo 3);


Photo 3. Ocna Sibiului- agricultural technology of intensive type (original photo)

The determination of the collected material: the phase in the lab had some operations such as unpacking the samples, labeling and numbering them and then followed by their determination. For this last operation there were used a number of determiners [15, 16, 21 and 26]. For the raw sorting of the biologic material was used a magnifying glass IOR 1983 and for determination and getting photos the binocular magnifying glass Olympus SZ 61;
There were done two categories of analysis: quantitative analysis of the collected fauna

through the method of pitfall traps and quantitative analysis with the identification of the beneficial and pest species in the researched corn area.

RESULTS AND DISCUSSIONS

Nowadays in Romania there are cultivated with corn an area of approximate 3 million hectares every year, illustrating the importance of this culture for the Romanian farmers [11].

Regarding the surface cultivated with corn in Ocna Sibiu locality, where the researches took place, it came out that it grew from 209 till 2012 from 962 hectares to 1,720 hectares. The technology of applied culture in the area is one of intensive kind. The technologic elements were as follows:

-Preparing of the field was done by: ploughing, disking, crushing and sowing;
-The previous plant was wheat;
-The sort used was Pioneer P9025;
-The sowing took place on 18th April 2012;
-The density at sowing was of 66,000 plants/hectare;
-The fertilizing process was done with N P K 15/15/15 (300kg/hectare);
-The chemical treatments were applied at the seed (Semnal 500 FS, Nuprid AL 600 FS, for the soil pests – 10l/hectare);
-The agricultural system was not irrigated.

Taking into consideration its tropical and subtropical origin, for the corn the humidity represents one of the command factors of first importance for the growing as, especially for accomplishing the values of optimum productivity.

The area that was chosen for experiment was affected during the last years but especially during the year of the experiment (2012) by a systematic, profound drought that influenced negatively, in the highest degree the cereal production in the entire Sibiu County. The structure of the biodiversity of the epigeal fauna was strongly and directly influenced by this command factor.

In table 1 there is presented the taxonomic structure as well as the quantitative one of the collected fauna through the pitfall traps (Barber traps) method, in the Ocna Sibiu agricultural ecosystem during 2012.

Table 1. The taxonomic and quantitative structure of the collected fauna through the pitfall traps in Ocna Sibiu locality, Sibiu County during 2012

Order/subclass	Numerical Abundance	Relative Abundance
Isopoda	1	0,12
Scutigeromorpha	1	0,12
Scolopendromorpha	1	0,12
Acari	144	17,33
Araneae	49	5,89
Collembola	301	36,23
Orthoptera	4	0,48
Thysanoptera	12	1,45
Heteroptera	33	3,97
Homoptera	8	0,97
Hymenoptera	102	12,27
Coleoptera	128	15,40
Diptera	47	5,65
Total	**831**	**100,00**

The samplings collected from the corn field (applying an agricultural technology of intensive type) comprised invertebrates from 13 taxonomic groups: *Isopoda, Scutigeromorpha, Scolopendromorpha, Acari, Araneae, Collembola, Orthoptera, Thysanoptera, Heteroptera, Homoptera, Hymenoptera, Coleoptera*, *Diptera* (Table 2).

The taxonomic groups with the highest numerical abundance were: Collembola with 301 samples (36.23%), Acari with 144 samples (17.33%), Coleopteron with 128 samples (15.40%), Hymenoptera with 102 samples (12.27%). The taxonomic group with the lowest numerical abundance was: Orthoptera with 4 samples (0.48%) and Homoptera with 8 samples (0.97%).

The structure of the great groups on the experimental fields in Ocna Sibiu emphasized the dominant position of class Insecta with 634 samples (76.42%) comparing to other groups of Arthropod with only 196 samples (23.58%).

From the total of collected agricultural fauna with the help of pitfall traps there were identified 52 species of insects from which 31 beneficial ones (Table 2) and 21 pest ones (Table 3). The dominant order of insects was Coleopteron with 35 species.

Table 2. Species of beneficial collected insects in the agricultural ecosystem in Ocna Sibiu with the help of pitfall traps in 2012

Nr	Species	Order	Family
1	*Sminthurus viridis* L.	Collembola	Sminthuridae
2	*Entomobryia arborea* Tullb.	Collembola	Entomobryidae
3	*Bourletiella pruinosa* Tullb.	Collembola	Sminthuridae
4	*Ceratophysella bengtssoni* Agren	Collembola	Hypogastruridae
5	*Formica rufa* L.	Hymenoptera	Formicidae
6	*Lasius flavus* L.	Hymenoptera	Formicidae
7	*Myrmica rubra* L.	Hymenoptera	Formicidae
8	*Oxytelus nitidulus* Grav.	Coleoptera	Staphylinidae
9	*Mycetoporus Mulsanti* Gangb.	Coleoptera	Staphylinidae
10	*Mycetoporus clavicornis* Steph.	Coleoptera	Staphylinidae
11	*Trogophloeus rivularis* Strm.	Coleoptera	Staphylinidae
12	*Cantharis fusca* L.	Coleoptera	Cantharidae
13	*Anthrenus verbasci* L.	Coleoptera	Dermestidae
14	*Amara eurynota* Panz	Coleoptera	Carabidae
15	*Idiochroma dorsalis* Pontopp.	Coleoptera	Carabidae
16	*Anchus obscurus* Herbst.	Coleoptera	Carabidae
17	*Nebria Gyllenhali* Schönch.	Coleoptera	Carabidae
18	*Microlestes maurus* Strm.	Coleoptera	Carabidae
19	*Poecilus cupreus* L.	Coleoptera	Carabidae
20	*Harpalus distinguendus* Duft.	Coleoptera	Carabidae
21	*Harpalus pubescens* Müll.	Coleoptera	Carabidae
22	*Brachynus explodens* Duft.	Coleoptera	Carabidae
23	*Brachynus psophia* Serv.	Coleoptera	Carabidae
24	*Brachynus crepitans* L.	Coleoptera	Carabidae
25	*Malachius bipustulatus* L.	Coleoptera	Melyridae
26	*Dasytes niger* L.	Coleoptera	Melyridae
27	*Dasytes obscurus* Gyll.	Coleoptera	Melyridae
28	*Cryptocephalus fulvus* Goeze	Coleoptera	Chrysomelidae
29	*Cicindela campestris* L.	Coleoptera	Cicindelidae
30	*Calliphora vicina* Rob.& Desv.	Diptera	Calliphoridae
31	*Sarcophaga carnaria* L.	Diptera	Sarcophagidae

Table 3. Species of pest collected insects in the agricultural ecosystem in Ocna Sibiu with the help of pitfall traps during 2012

Nr	Species	Order	Family
1	*Cacophsylla melanoneura* Först.	Homoptera	Psyllidae
2	*Melanogryllus desertus* Pall.,	Orthoptera	Gryllidae
3	*Adelphocoris lineolatus* Goeze	Heteroptera	Miridae
4	*Adelphocoris seticornis* F.,	Heteroptera	Miridae
5	*Opatrum sabulosum* L.	Coleoptera	Tenebrionidae
6	*Agriotes segetum Den.& Schiff .*	Coleoptera	Elateridae
7	*Melanotus crassicollis* Er.	Coleoptera	Elateridae
8	*Tanymecus dilaticollis* Gyll.	Coleoptera	Curculionidae
9	*Meligethes coracinus* Strm.	Coleoptera	Nitidulidae
10	*Diabrotica virgifera virgifera* Le Conte	Coleoptera	Chrysomelidae
11	*Chaetocnema tibialis* Illig.	Coleoptera	Chrysomelidae
12	*Phyllotreta vittula* Redtb.	Coleoptera	Chrysomelidae
13	*Phyllotreta nemorum* L.	Coleoptera	Chrysomelidae
14	*Aphthona herbigrada* Crt.	Coleoptera	Chrysomelidae
15	*Podagrica malvae* Illig.	Coleoptera	Chrysomelidae
16	*Haltica palustris* Weise	Coleoptera	Chrysomelidae
17	*Anoxia villosa* L.	Coleoptera	Scarabaeidae
18	*Oxythyrea funesta* Poda	Coleoptera	Scarabaeidae
19	*Meromyza nigriventris* Macq.	Diptera	Agromyzidae
20	*Agrotis segetum* Den. & Schiff	Lepidoptera	Noctuidae
21	*Pyrrochoris apterus L.*	Heteroptera	Pyrrochoridae

An indicator of great importance for the state of the structural and functional parameters of a biocoenosis belonging to the inhabited eco systems, with often enters modifications in the system (input) is represented by the ratio beneficial fauna -pest fauna. The ratio between these two types of fauna allows choosing the optimum method of keeping the equilibrium between the species of the system and applying those methods of management which would affect as little as possible the system in its assembly and to determine the growth of the production. In the case of our researches the ratio is favorable to the beneficial species of insects (Table 2, Table 3).

CONCLUSIONS

The identifies species in the researched agricultural ecosystem were grouped in beneficial species (30) and pest species (21) as a result of emphasizing the way of live and the ecologic functions in the trophic chains that are fulfilled by each and every species.

The ratio beneficial fauna/pest fauna indicates the equilibrium or non equilibrium state in the researched corn field and imposes applying the measures of amelioration that are adequate for a lasting economic development in the benefit and for the welfare of the entire community.

The ratio beneficial fauna/pest fauna (BF/PF) was positive at the field in Ocna Sibiu, this being in the favor of the beneficial fauna. This indicates the maintaining of the structural and functional parameters of the agricultural ecosystem at values above the level of resilience.

In the agricultural ecosystem Ocna Sibiu the impact of the technology of intensive applied type upon the biodiversity of the epigeal fauna was amplified by the maintaining at high values of pressure of the natural command factor and namely the excessive and persisting drought during the last 3 years, correlated with the not irrigate system in which was cultivated the corn in the experimental plot.

The samplings collected with the pitfall traps method comprised organisms from 13

taxonomic groups: *Araneae, Collembola, Orthoptera, Thysanoptera, Heteroptera, Homoptera, Hymenoptera, Coleoptera, and Diptera*. The taxonomic groups with the highest numerical abundance were: Collembola, Acari, Coleopteron and Hymenoptera. The taxonomic groups with the lowest numerical abundance were: Isopoda, Scutigeromorpga, and Scolopendromorpha each with a sample, followed by Orthoptera and Homoptera.

From the arthropods the highest number of 634 belongs to the insects, their dominant order being Coleopteron with 35 species.

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ATTACHMENT TO FORESTS IN ROMANIA; DOES A HISTORY OF COLLECTIVISM MAKE A DIFFERENCE?

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Abstract

Forests in Romania are facing significant environmental problems. Due to the large transformations the forestry sector has undergone as a result of the communist period, sustainable forest management is highly relevant. Rural communities, who are dependent on the forests for their daily livelihood, need to be included in discussions regarding sustainable forest management. This paper calls for the need of understanding how these transformations have affected rural people's attachment to the forests that have been for such a long time taken away from them. Two types of rural communities can be distinguished, those affected by collectivisation of agricultural land and those not. This paper addresses the functional and emotional attachment to the local forests of a former collectivized and of a non-collectivized community. We found that people in both communities are functionally attached to the forest, through a range of social benefits, mostly 'recreation' and 'healthiness', and economic benefits, especially the use of wood. Attachment was negative thru the economic detriments 'decrease of wood availability', 'high costs of forest management', 'wood theft' and 'ineffective forest regime'. People in both communities are emotionally attached to the forest through feelings triggered mostly by a sense of kinship with family members. As a final conclusion, in the former collectivized rural areas, people are less attached to the forest compared to people in the non-collectivized rural areas and these differences can be linked to the transformations triggered by the former collectivisation process, but also to the weak regulation of the privatized forests, the limited financial possibilities and access restrictions.

Key words: *collectivisation, forest, nationalisation, place attachment, NE Region of Romania*

INTRODUCTION

In Romania, forests cover 6.4 million ha, which is almost 28% of Romania's total land area. Romanian forests, especially the forests that are part of the Carpathian chain, are known for their rich bio-diverse ecosystems which harbour many endemic species and viable populations of endangered species, in particular many large carnivores and herbivores [7], [9]. The Romanian forests, however, are subject to illegal logging and prematurely wood harvest that lead to significant environmental problems.

According to the World Bank [19] private forests face the most significant environmental problems due to the weak regulation of privatized lands including lack of proper management, proper planning and silvicultural knowledge.

The private forestry sector has experienced important changes in Romania. Between 1948 and 1989, under the communist regime, all forests were nationalised. Consequently, in that period, all private forest owners were expropriated, including many peasants whose livelihood was based upon a combination of agriculture and forestry work [17]. Later on, in the 90's, when the private property law in

Romania was approved, some of the former forest owners could reclaim their forests properties. Hence, today, Romanian forests are a mixture of private and state-owned forest [16]. About 11% of Romanian forests are owned privately, with properties varying from 1 ha up to 10 ha [20]. Most of these private forests are owned by peasants living in rural communities close to the forests. Rural people depend on the forests for their daily livelihood (provision of fire wood, construction wood and grazing areas for sheep and cattle), however, they also want to make money from their forest properties by harvesting and selling wood, without necessarily considering sustainability [16]. Consequently, both for ecological and socio-economic reasons it is important that Romanian forests are managed well. In the communist period, however, rural communities were not only affected by the nationalisation of all forests, but also by the collectivisation of agricultural land. The period of communism transformed rural places significantly, which can led to a rupture in people's affinity to the land [4], [5], [14], [8]. Not all communities, however, were collectivized; about 10% of the total rural area, particularly mountain communities, were excluded from the collectivisation process [3].

In this research we want to gain a deeper understanding of the relationships of Romanian rural people with their forests in two rural communities, one former collectivised and one non-collectivised community. We will use the concept of 'place attachment', which is a process through which people show a certain affinity to a place "*directly by giving attributes to the physical setting or indirectly through certain memories set in place or through important descriptive meanings to which people are attached*" [14]. Attachment can be either functional, which refers to the (dis)satisfaction of user needs in terms of quantity and quality of the place [13] or emotional, which refers to those dimensions of the self that define the individual's personal identity in relation to the place [10]. We assume that rural communities with a history of collectivism have less affinity to the local forests than rural communities that have not been collectivised. We are also interested to what extent present forest ownership influences forest attachment. As attachment is an important indicator for people taking care of a place, in this case, the forest, the presented findings provide valuable information for planners and politicians involved in rural development.

MATERIALS AND METHODS

We have carried out a qualitative comparative case study research and selected two communities from East Romania, a formerly collectivised community called *Prohozesti* and a non-collectivised community called *Lapos*. They are situated only 15 km from each other in the county of Bacau which indicates that they are quite similar in terms of socio-economic, political and cultural conditions. Privately owned forests are located in the nearby mountains or at the edge of the village (Lapos) or further away from the village (Prohozesti). On average, the total surface of the owned forests does not exceed more than 5 hectares.

We conducted semi-structured interviews with inhabitants from both villages (N=13 for Prohozesti and N=13 for Lapos) covering a high range of individualities: age, gender, social status, and forest ownership. Respondents were mainly selected through snowball sampling [18]. The analysis of the data [6], was done according to the following steps: *familiarizing* with the data, *developing a coding scheme* for analysing the themes that occurred most, *indexing* or coding the data, *charting* or rearranging the data by theme in a table, and the last step was *mapping and interpretation* of the results by looking at relationships between and within the themes and the typologies developed from them. For more in-depth information see [1] and [2].

RESULTS AND DISCUSSIONS

Functional attachment

Functional attachment was expressed *economically*, referring to material goods that

the can be derived from the forest, and *socially*, referring to immaterial goods. Both can be perceived *positively (benefits)*, which implies a high functional attachment, and *negatively (detriments)*, which implies a low functional attachment. Figure 1 depicts the economic and social benefits and detriments of the forests as perceived by the people from the two communities.

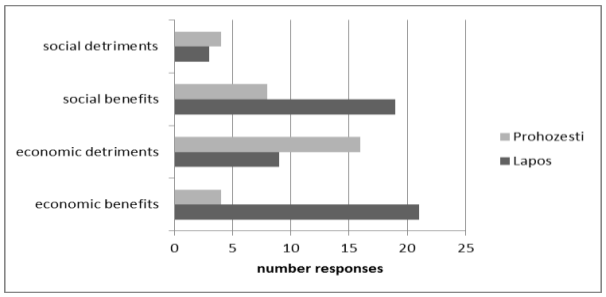

Fig. 1. Differences in functional attachment to the forests of Lapos and Prohozesti

Economic benefits

Wood (Lapos n=9, Prohozesti n=3). The most needed product is wood, as both communities are depending on it. This benefit is especially mentioned by people who earn a living as wood carrier and who, due to their often presence in the forest, also have knowledge about the quality of the wood. The quality of wood depends on how well the forest is maintained and it seems that people are not always satisfied with it as we will see bellow in 'economic detriments'. Wood carriers from Lapos consider it being profitable to bring wood for themselves and also to sell wood in the village: "*working in wood exploitation is profitable due to the satisfactory wood quality, hard wood and soft wood suitable for different needs"*. In Prohozesti, one wood carrier and two mountain forest owners showed this type of satisfaction.

Non-timber forests products. The most common activity for the people from Lapos (n=6) and to a lesser extend in Prohozesti (n=1) is picking wild mushrooms. It seems that it is not only a way to gain goods from the forest, but also a way to socialize with other villagers: *"I go every year to pick mushrooms and conserve for the winter time, I enjoy it very much especially because we join in a group of more people*".

Money buffer was mentioned only among respondents from Lapos (n=5) who own either mountain forests or little forest patches in the village. It was expressed through people's willingness to *"keep the forest as intact as possible"* and *"let the forest grow beautiful and strong"* or to save it as "*a guarantee for old age days"*. According to these villagers, the forest holds long-term economic benefits.

Tourism income, although Lapos region is not a touristic area, someone sees the opportunity to earn money with a wooden chalet that was built at the edge of its forest property.

Economic detriments

Low availability of wood was mentioned in Lapos (n=3) among the wood carriers who assess the decrease in wood availability by looking at the change in the distance between the village and the forest: *"In the past you could find fire wood immediately you exit the village, nowadays I must travel 10 kilometres further from the village to find some wood"*. In Prohozesti (n=3), people complain either that the wood is too expensive to buy; either that there is little available wood for wood carriers *"After 1993, I stopped working in wood exploitation due to the fact that much deforestation occurred and the wood availability decreased much therefore I had to travel some 30 km to find some wood"*.

High forests maintenance costs were mentioned in both communities. In Lapos (n=2) people think that the price for marking the trees is much too high among wood carriers and among forest owners. In Prohozesti (n=5) the following reasons were mentioned as implying high costs regarding the forest: "*high transportation costs"* due to the fact that the forests are far located from people's homes, *"access to extract the wood is difficult", "cost too much to mark the trees", "cost too much to transport the trees", "too high costs for guarding the forest".* The fact that forest owners lack the funding and mechanized utilities for maintaining their forests is found across all forest owners throughout Romania [19]. These kinds of frustrations push people in working against the system. For example someone in Lapos

told that in order to avoid having some trees stolen from an easy accessible area, he cut down the trees without asking the ranger to mark them, because he found it too expensive.

Wood theft occurs in both communities in the isolated forests patches where, contrary to the mountain forests, there is no guarding ensured by the forest rangers. This is mostly the consequence of the bad economic situation in Romania that pushes people, especially young people without a job in the position to chaotically deforest the forests and to sale the wood for some pocket money. In Lapos (n=4) wood theft takes place at a relatively small scale as only easy accessible individual trees from the little forest properties situated around the village are subject of theft, while in Prohozesti (n=5): *"they stole more than half the forest in this region"*. Because of this situation, for example in Prohozesti, people that own a patch of isolated forest were forced to deforested as much as possible before all the trees would be stolen by others. In Lapos, people manage to supervise their isolated forests because they are located near the village, so people have more control over their forests.

Ineffective forest management regime was mentioned only in Prohozesti (n=3). The following problems were mentioned: the price of the tree marking by the forest ranger was too high compared to the selling price, due to the intensive sheep grazing in the forest there is no chance for natural generation, and elsewhere the forests are better managed. In Lapos no one mentioned being dissatisfied with the forest management regime in their region; rather they expressed high trust in the work done by people working at 'Ocolul Silvic'(administrative forestry district). They mentioned three reasons for this trust: the strict rules imposed by 'Ocolul Silvic' for wood exploitation and "*not chaotic like what has happened in Asau*", single road access to the forest which means better guarding of the forest, and only few private forest properties while in Asau most of the people in that region received a patch of forest and *"since there is not much state control over the forests, the high deforestation rates that occurred in Asau".*

Social benefits

Recreation among respondents from Lapos (n=7) was expressed through a wide range of associations by which the forests gives people high levels of satisfaction: pure enjoyment (people like to see the forest for its beauty), positive energy (people claim to work better or to sleep better after being in the forest), unique views and sounds (wild animals, different view over the villages down the mountain, birds singing), solitude, freedom, no worries and escape from the daily life. One villager stated: *"When I am in the forest I do not think about any of the stress or problems I normally have".* In Lapos, there is a direct road that connects the village with the forest; as well the village is surrounded by little isolated forests. These two aspects seem to influence people in attending often the forest and therefore their rich view of the benefits that can be obtained from it. In Prohozesti, recreation (n=3) was expressed as visual and audible enjoyment of scenery ("*it is beautiful and birds are singing"*) or as the possibility to do recreational activities in the forest, such as barbecuing.

Health in Lapos (n=8) was mainly described through the forest's ecological functions such as: remediation of drinking water and as a source of fresh oxygen. Two respondents emphasized these functions as follows: *"without forests we cannot live"* and *"forests are the centre of the universe, due to the forests we can breathe, otherwise we will die earlier and because of the forests it rains on time"*. On the other side, in Prohozesti (n=3), healthiness was referred to only one type of ecological function: source of fresh oxygen. The few social benefits associated with the forest by people from Prohozesti, were mentioned by people that come in contact with the forest either because they are forest owners, or because they are involved in logging, or visit family that live in the mountain areas. The other people told that they find it too expensive to travel to the forest because of their low financial possibilities.

Safety (Lapos n=2 and Prohozesti n=2) was expressed through the forest's ability to prevent soil erosion and through flood control: *"The forest in this region is the principal pawn in flood control especially because in our region there is a big water dam situated at the edge of the forest".*

Socio-cultural interaction for people from Lapos (n=2), the forest is also a place where socio-cultural activities take place. The two activities mentioned are: 'hramul manastiri' (commemoration day of the monastery which was the first settlement in this region) and 'rascolul oilor' (villagers summer gathering for counting of sheep that are left in the care of the shepherd to graze them in the mountains from the early spring to the late autumn). Socio-cultural activities related to the forest were not mentioned in Prohozesti.

Social detriments

A forest is not always a safe and pleasant place to be and therefore villagers mentioned also some social detriments. Regarding 'safety', in each community there were few respondents (Lapos n=3 and Prohozesti n=4), mostly among those that are exploiting wood, who referred to the dangers that they encounter in the forest: *"Because of the muddy road I could not control the tractor fully loaded and my son was almost crashed by a log".* Regarding 'displeasure', it seems that the forests around Prohozesti are not that clean and this makes people feel unpleasant and therefore less attracted by forest: "*When I see plastic bottles thrown in the forest that makes the forest being less attractive for me".*

By summing all the forest outcomes relating to functional attachment -as showed in Figure 1- we can conclude that both socially and economically people from Lapos seem to obtain more benefits from their forests when compared with people from Prohozesti where the detriments seem to predominate.

Emotional attachment

The emotional attachment attributed to the forest was expressed mostly through verbal feelings but also through non-verbal feelings: facial expressions, crying, angry tones. The verbal feelings thought to express what the forest symbolizes or stands for in the view of the respondents from both communities will be classified in 'positive emotional attachment' and 'negative emotional attachment'. Figure 2 summarises the aspects of emotional attachment to the forests mentioned by villagers of both communities.

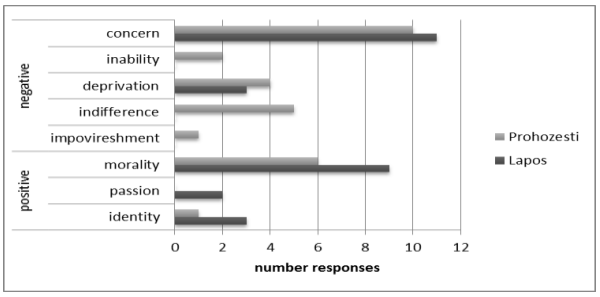

Fig. 2. Differences in emotional attachment to the forests of Lapos and Prohozesti

Positive emotional attachment

Identity (Lapos n=3, Prohozesti n=1) connects the place to respondent's sense of who they are as individuals*: "the child of the woods", "people born in mountain area are strong and hardworking", "feeling proud for being able to provide wood for the household",* and *"I was born in the mountain area, therefore I love the forest and each tree".*

Passion as an expression of love through the cycle of life was mentioned by respondents from Lapos exclusively (n=2): "*I love the forest, being there in the spring time it feels like I am reborn again*".

The **moral duty** to preserve the forest in the family is mentioned frequently (Lapos n=9, Prohozesti n=6). It represents the ability to pass the forest to the children, translated here as 'continuity': "*I am very persuaded in my decision to pass the forest to my children and hopefully I will not be forced to deforest too much for myself".* In Lapos, also villagers that do not possess a forest share this duty as they consider it a moral thing to pass the forests to their children in good condition so that they can also benefit from the same social and economic goods as their ancestors did: *"We cannot destroy our forests and pass barren hills to the next generations. People should be responsible for their actions. Our health, the quality of the drinking water and the landscape beauty depends on the forests".* Secondly, moral duty relates to 'heritage'. As

the forest was once in their parent's possession, it is an important reason to be attached to it: *"I inherited the forest from my grandfather; he would twist in his grave if I will not take care of his forest"*. The third moral aspect is 'reconciliation with nature' and was mentioned only by respondents from Lapos as a form of easiness in accepting losses caused by natural occurrences such as attack of large carnivores on livestock and people, or wild boars that destroy the maize crops. As one of the respondents argued, people in Lapos guide themselves by the principle that: *"padurea ne da si padurea ne si ia"*, which means *"the forest gives us, the forest takes from us"*. This attitude of accepting with ease the damage caused by wild animals was only present amongst people from Lapos.

Negative emotional attachment

Concern about deforestation and private ownership was expressed in both communities. Deforestation of local forests was a big concern for inhabitants of both villages (Lapos n=5, Prohozesti n=5). People noticed deforestation at a higher rate than in the past. Many interviewees got very emotional; they started crying or had an angry tone in their voice when asked to talk about the forests. They all said the same thing, that the forest is no longer what it used to be and that the older generations knew better how to cherish the forest: *"When I see the barren hills it breaks my heart. The forest is 80% destroyed (here he refers to the forests in Asau). The older generations knew how to really appreciate the forest. Until the 90's the forest was intact, with massive trees, and when you look now ...., there are now meadows instead of woods"*. Private ownership was considered to be a causal factor for deforestation and bad forest management in both communities (Lapos n=6, Prohozesti n=5). This was based upon personal experiences in their area: *"forest was better when it was the property of the state"*, *"forest was better under the state ownership"* or upon what they heard from other places like Asau region where forests were destroyed as a consequence of private ownership: *"much forest is deforested nowadays; did you hear what happened in Asau? People devastated the forest when they received it back from the state"*.

Inability to change the fact that their forests are subject to wood theft was expressed only among respondents from Prohozesti (n=2). People felt powerless because the forestry state department, the police and even their own children don't show any willingness in helping them out: *"the state doesn't help me at all and my children show no interest"*.

Feelings of deprivation, (n=3 in Lapos and n=4 in Prohozesti) expressed by people that feel deprived of forest benefits and the ones that feel deprived of ownership rights. The reasons for feeling 'deprived of forest benefits' are found to be different for the two communities. In Lapos this type of feeling was triggered by the restricted access since a large part of the forest in this area was claimed by an Austrian royal heir, who "*became forest owner overnight".* The seriousness of this newly installed forest regime can be seen in the following expressions: *"If they catch you taking one mushroom from their forest, they put the trigger on you", "Every day I see how fully loaded trucks are bringing wood away from the forests that me and many people from this region planted with our hands."* Thus, people feel threatened and restricted to do the forestry activities that they used to do in the past. In Prohozesti, deprivation of forest benefits was expressed by people that have a forest only on paper because the trees were cut down and stolen: *"People with tractors and chainsaws took advantage of the situation; all the others just watched and suffered*". The second kind of deprivation feelings includes the people that feel 'deprived of ownership rights' who consider it unfair that they did not receive the inherited forest for different reason, either because of some administrative complications: *"Darmanesti is the only region where the city hall didn't find the right papers to help the people get their forest properties"*(Lapos), either because some other people in the region had higher priority *"Only elite people receive*

their forest properties, such as the mayor who got 10 hectares of forest without any ownership rights." (Prohozesti)

Feelings of indifference (n=5 in Prohozesti, none in Lapos). One respondent showed its indifference by telling that the deforestation that takes place in the area is not of its concern as long as this is not its forest property. The other four respondents expressed their indifference towards the forest by not having the willingness or the interest in maintaining the forest or showed no interest in taking over the forest they should normally inherit from family relatives: *"I have no idea and no interest to know what happened to my parent's forest property."*

Feelings of impoverishment expressed among one respondent from Prohozesti who sees the forest properties of his father more as a burden: *"It is better that I didn't claim the forest property inherited from my father because if it was in my name I would have to pay taxes starting next year, as it will be considered abandoned land"*.

In Fig. 2 we can see that in Lapos the richness in positive feelings is higher than in Prohozesti where people express rather more negative feelings, which means that the level of emotional attachment among people in Lapos is higher than in Prohozesti. In both communities, similar feelings determine largely emotional attachment: 'feelings of morality' accounts most for the positive attachment and 'feelings of concern' account most for the negative attachment.

CONCLUSIONS

1.A comparison of functional and emotional attachment to the forests of Lapos and Prohozesti

In both communities, the forest is an important resource as people are dependent on wood for their livelihood, particularly because most of them are not rich. This dependency contributed to the decrease of the amount of trees in forests and explains why people are not satisfied with the availability of wood that can be obtained from the forest. Although this is also relevant for Lapos, it especially explains the low functional attachment of Prohozesti. In Lapos, people compensate this inconvenience with other benefits offered by the forests like the long term economic benefits such as 'money buffer'. Thus, place attachment is not only associated with perceptions of present conditions but rather the anticipated future condition of the place make people stay attached to it.

Functional attachment also entails social benefits, such as recreation, health and socio-cultural interaction. Through the rich range of social benefits mentioned by people from Lapos, we can deduct that in Lapos people have a brighter view of what a forest can offer besides the economic goods than in Prohozesti. This can be explained by their intense contact with the forest. Moreover, they have knowledge about the elements that are part of the natural environment that they come in contact with. As the literature [15], [12] says that, people valuing the environmental values of the forest are being more responsible towards it, we can presume that perhaps the future of the forest in Lapos is in good hands.

Concerning the emotional attachment, positive emotional attachment is triggered mostly by a sense of kinship with family members. People in both communities expressed their desire to keep these properties in the family from a wish to pay respect to their ancestors and also the willingness to pass the properties to their children. But there is also a rich range of negative feelings expressed in both communities and these feelings are born from the negative aspects of the forest at functional level. In other words, the forest detriments trigger negative feelings towards that place. This can explain also the lower emotional attachment found in Prohozesti, especially among those that in general were negative about the economic benefits that the forest can offer to them.

2.The impact of the collectivism period

The forests in both communities were part of the same nationalisation system, which means that both regions were subject to similar transformations. Thought, the former collectivisation system that occurred only in

Prohozesti seems to have brought some indirect implications that may be linked to the differences found in the attachment between the two communities. In such, we can say that the inclination among the respondents from Prohozesti to value more the economic benefits than the social benefits could be related to changes of people's habits to be production orientated as they learned during collectivisation times and overlook other types of benefits.

A second implication found to be linked to the former collectivisation system is that in the affected community people lost the habit in raising horses which means that nowadays people don't dispose so easy of transportation means that could be helpful in maintaining or guarding more often their forests. In combination with the fact that the forests nowadays are under different management regime which seem not that effective as much uncontrolled deforestation occurs and wood theft and no chance for remediation, make people in Prohozesti to be less satisfied with their forests and also express a multitude of negative feelings.

3. The role of private forest ownership

People's negative feelings towards forests is also caused by the frustrations they got due to the shift from a state-owned forest to a mixture of private and state-owned forests, which created a chaos regarding the current management methods compared to past times. Contrary to the expectations, privatization brought many negative changes to the forests such as: poor guarding of the forest which leads to uncontrolled deforestation rates and wood theft, high maintenance costs for (new) owners and unequal distribution of the forest parcels as well lack of organization and falsity in the arrogation of the forest. All these changes lead to low satisfaction among forest users as they are finding it difficult to gain any profit from their forests, especially among people from Prohozesti were forests are valued mainly for the economic goods. This type of dissatisfaction that leads to lack of interest in the new properties seems to occur often in Romania among the new forest owners [11].

4. Other important factors

Two other factors appeared to be highly significant for people's attachment to the local forests. Access restriction influences people's attendance to the forest. The difficult access to the forest of those living in Prohozesti may be the reason for the people for not visiting the forests regularly and therefore having narrower views of what the forests may offer them besides wood. Consequently, people from Prohozesti are less satisfied about the social benefits than people from Lapos, for whom the contact with the forests is facilitated by the direct access road, smaller distance to the forests and possibilities to travel by horses. These types of questions may be the object of a further research in this area. Secondly, low financial possibilities restrict travel opportunities to the forest either for relaxation or maintenance. Again, this might impair the limited view of what benefits a forest can offer to people from Prohozesti. Low financial possibilities might also be the reason that uncontrolled deforestation occurs in the two communities, since many people with no job use the forest as a source of income. Because the deforestation is done mainly illegal and chaotic, it triggers low satisfaction and negative feelings among people from the two communities.

To resume, we cannot assume that the differences between the two communities in level of functional and emotional attachment to forests are only influenced by the former collectivisation system. They are also influenced by variables such as: the weak regulations of the forest privatization system, access to the forest and the low financial possibilities that people in Romania are facing nowadays. As a general conclusion, based upon our two cases, we could assume that in the former collectivized communities of Romania people are less attached to their forests than the people in the non-collectivized communities were functionally and emotionally they account for a more positive attachment. Based on these findings it would be advisory to take in account the historical background of the involved

communities in the proposed measures in rural developing plans.

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THE NECESSITY OF DEVELOPING BLUEBERRY PRODUCTION

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Abstract

This article presents the advantages of cultivating blueberries, both economically and from an alimentary and therapeutic point of view. By calculating profit per hectare for the most productive varieties of blueberry, it was shown that this culture is particularly profitable for young farmers. In fact, blueberries have significant therapeutic value, being used in food and pharmaceutical industry.

***Key words*:** *blueberries, productive varieties, profitable, therapeutic value*

INTRODUCTION

The blueberry fruits were used in ancient times by indigenous peoples in North America, especially for their healing properties, because they originate from this area [1]. It is mentioned as a medicinal plant in Europe from the twelfth century, used especially for lung and liver diseases and to treat wounds.
Forest fruits production has increased in recent years as consumers discover their healing effects and more. According to the Statistical Yearbook of Romania, forest fruits production increased in 2011 compared to 2008 to 41.57% as of 6493.5 tones [2].
Forest fruits now gain more popularity among consumers due to their benefic effects.
They contain many useful substances for people like vitamins, proteins and anthocyanins (those substances that give fruit red or blue color).
Blueberry extract is great for increasing visual acuity and the circulatory system, being recommended for people with low blood pressure or those with diabetes, myopia, arthritis, varicose veins and hemorrhoids.
It is important to mention the fact that there is no adverse effect of using blueberry extract for both nutrition and therapeutic purposes.

MATERIALS AND METHODS

For this study we used data collecting methods such as bibliographic study (books, articles, Statistical Yearbook of Romania and Internet addresses). Among the methods used for collecting and processing I used: document analysis, statistical and mathematical analysis, and data interpretation methods such as the deductive method.
The standard range deviation is calculated using the formula $\sqrt{X} = \sqrt{\frac{(x-y)^2}{(n-1)}}$, where y is the average of 5 years.
The variation coefficient $c\% = \frac{\sqrt{X}}{y} \times 100$ is the ratio between the standard range deviation and the average of 5 years.
The variation coefficient has the following limitations: up to 10%, c% is low in value, between 10.1% and 20%, c% has a medium value and more than 20.1%, the value of c% is high.
To calculate the most productive varieties of blueberries, I used average standard deviation, average production per plant for 5 years and confidence limits[3].
The average standard deviation is calculated using the formula $\sqrt{\bar{X}} = \sqrt{\frac{(x-y)^2}{n(n-1)}}$, where y is the average production per plant in 5 years.

Confidence limits are of two types: upper limit, which is calculated as $y+\sqrt{\bar{X}} \times Tp$ and the lower limit, which is calculated as $y-\sqrt{\bar{X}} \times Tp$. Tp is the probability of transgression.
The probability of transgression is 2.13 for a 90% probability to a 10% risk.
Oscillation amplitude of the confidence limits= $((\bar{X}+ðx*tp - \bar{X}-ðx*tp)/(\bar{X}))*100$

RESULTS AND DISCUSSIONS

The therapeutic and alimentary importance of blueberries (Vaccinium corymbosum)

Blueberries have significant therapeutic value because of their content in organic substances such as anthocyanins, tannins, and phenolic acids, salts of potassium, calcium, phosphorus, sulfur, magnesium, chlorine, manganese, iron, vitamins A, C, E, PP, B1, B2 and proteins. In fact, blueberries are considered the best antioxidant fruits.
Blueberries' antioxidant activity is 10 times higher than that of other fruits and vegetables [4].
Both blueberry fruit and leaves are astringent due to tannins. They have antibacterial activity, altering in a favorable way the intestinal pathogenic flora. The leaves are used in the composition of dietary tea. The fruits are used to prepare cakes, jams and other sweets or to obtain blueberry liquor.
The fruit can be eaten fresh; they are indicated especially for increasing immunity and are recommended for people who suffer from obesity [5].
Blueberries and blueberry leaves can be used in the cosmetic industry in poultices and masks due to the antibacterial effect.
In our country, blueberries are not consumed in large quantities; they are being sold by traders especially in mountain areas.
This fruit are actually of spontaneous flora [6] and is an insignificant amount compared to what we could produce. In Romania, the first blueberry crop was established in 1968 with the varieties Blueray and Coville [4].
The biological particularities of the blueberry tree are various forms (shrubs) and heights from 0.6 m to 2.5 m, the fruits are grouped in racemes and are resistant to frost.
The fruit is a berry, spherical, flattened in most varieties [7]. The fruiting period starts in the first four years after planting, and the yield per hectare is 5-10 tones [4], a ton of blueberries bringing a profit of 3,000 Euros.
In our country blueberries are sold by the producer in season for 4 RON per kilogram and a pound of blueberries given to export reaches 3-4 Euros.
Also, in the local markets a kilogram of blueberries can even get to 15 RON.

Blueberry production per plant

Table 1 presents data with reference to the average blueberries production per plant, in kilograms. Using calculation methods, we could identify the most productive varieties of blueberries.

Table 1. Size of the average standard deviation and oscillation amplitude of the confidence limits for blueberry production per plant

Variety / Years	Average 1999-2003	Average Standard Deviation	Confidence Limits Probability 90%, risk 10%		Amplitude of the confidence limits %
			Min.	max	
Bluecorp	1.7	0.57	0.48	2.92	143.5
Blueray	1.71	0.39	0.87	2.55	98.2
Herbert	1.27	0.34	0.54	2.01	115.7
Ivanhoe	1.07	0.23	0.58	1.56	91.6
Coville	1.3	0.31	0.63	1.96	102.3
Rubel	1.4	0.4	0.55	2.25	121.4
Burlington	1.15	0.33	0.44	1.85	122.6
Zuckertraube	1.14	0.37	0.36	1.92	136.8
Atlantic	0.8	0.19	0.39	1.21	102.5
Pioneer	1.13	0.35	0.38	1.88	132.7
Pemberton	1.9	0.42	1	2.8	94.7
Collins	0.77	0.17	0.41	1.12	92.2
Weymouth	0.63	0.12	0.38	0.87	77.8

Source: Processed data from Bădescu C., 2004, Ph. D. Thesis.

Economic efficiency of the blueberry culture

To calculate the coefficient of variation of gross profit for blueberry culture I used the standard range deviation and the average of five years of full fruiting period.

Regarding the variation coefficient of profit, in Table 2 we can see that its value is 54.83%, thus having a very high value.
This means that the profit varies significantly from 9959.88 RON in the first year to 42,495.47 RON in the last year.
Profits may be doubled but if we use the most productive varieties and appropriate culture technology.
Regarding the production expenses the calculation demonstrates a medium variation which means certain homogeneity of expenses during the studied years.

Table 2. Size of the standard range deviation and variation coefficient of the production indicators for the period 1999 - 2003

No.	Specific.	MU	Years' Average	Standard range deviation	Variation coefficient	
					%	Signif.
1	Production	kg/ha	22177,3	10661,15	48,07	High var.
2	Production Value	RON	33265,9	15991,73	48,07	High var.
3	Production Expenses	RON	5643,93	1023,28	18,13	Med.var.
4	Gross Profit	RON	27622,0	15143,49	54,83	High var.

Source: Processed data from Bădescu C., 2004, Ph. D. Thesis.

CONCLUSIONS

Forest fruits are consumed increasingly more due to their therapeutic properties and their numerous uses.
Of these, blueberries are best in terms of alimentary and therapeutic purposes, both fresh and canned or dried.
Upon completion of calculations using statistical and mathematical analysis methods it was found that the most productive varieties of blueberries are Bluecorp, Pemberton, Blueray, Rubel and Herbert.
Using these varieties a considerable profit can be achieved within 5 years.
Even if the investment and maintenance costs of the blueberry culture are high the profitability is significant, reaching very high profits because of the demand for these fruits is increasing especially in Western countries, for use in pharmaceutical and food industry.
Young Romanian farmers should turn to this culture due to its high profitability.

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CHARACTERISTICS AND STRATEGIC DEVELOPMENT OF PORK SECTOR IN MOLDOVA AND THE EUROPEAN UNION

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Abstract

The paper is a comparative study of the pig livestock between the Republic of Moldova and the European Union. The paper analyzes the dynamics and the current state of the meat market, especially the market of pig production, calculated indices of attractiveness of the project. The results demonstrate the high competitive sector from the European Union, the reserves increase on the sector from the Republic of Moldova, especially the costs and the price. The conclusions can be considered as recommendations for government institutions responsible for this sector.

Key words: *pig livestock, average value, consumption per capita, pig production industry.*

INTRODUCTION

Currently, the countries of the world are bred several hundred different breeds of pigs on color as well as the direction of productivity, and they are bred by crossing a number of species, reasonable selection of the best animals, the selection for the desired type and direction of growth of new generations.The greatest influence in the process of formed played a large white breeds formation, and is now widely used by Yorkshire, Landrace, Duroc, Hampshire, specialized in meat production. [3]
Recently, there has been a pronounced tendency to increase the production of pork meat that are in high demand among the population. In addressing the problem of pig meat in the world has a leading role in the meat and pork balance steadily ranks first (36%).[11]

MATERIALS AND METHODS

To analyze the specificity of development of pig meat sector were used official data from the National Bureau of Statistics of the Republic of Moldova, Statistical Abstract of the United States, FAO, FARPI, EUROSTAT. To study these processes have been studied scientific works of national and international specialists in the field.
During the investigations have used the monographic description of economic performance, comparison results, induction and deduction in drawing conclusions and proposals. The paper used the method of economic monographic studies using elements of deduction, observation, analysis and synthesis.

RESULTS AND DISCUSSIONS

On average, the share of the world total consumption of pork meat on average 36%.The highest proportion in the total consumption of pork meat seen in China - 71% of the EU - 58%, and the Philippines - 57%. This indicator is in the Republic of Moldova is 40%, compared with the average world data on more than 4 percentage points.
The recommended rate of meat consumption per capita (biological norm), which is typical for developed countries with high incomes and simply needed to maintain the normal functioning of the human body is considered to be the average value 57 kg / year. In the world of consumption of pork per person per year is 19 kg.

The highest consumption of pork in Hong Kong - about 70 kg / year, Belarus - 42 kg / year in the European Union - about 40 kg / year.

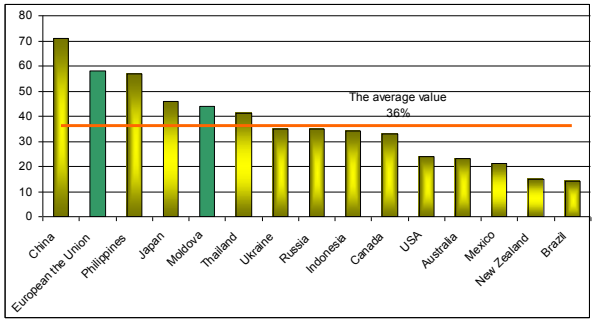


Fig. 1. The proportion of pork in the total consumption of meat, %. Source: [10]; FARPI.

At the level of pork consumption per capita Republic of Moldova lags behind comparable countries, amounting to 15.2 kg / year per capita (the total amount of the total consumption of meat - 28 kg / year per capita, using 2,8 times less meat products than European).

Hours Last 7 years, from 2006 to 2012, the EU pork production declined by 0,15% while reducing the number of pigs is 8,9% - the process is carried out through a more intensive use of animals.

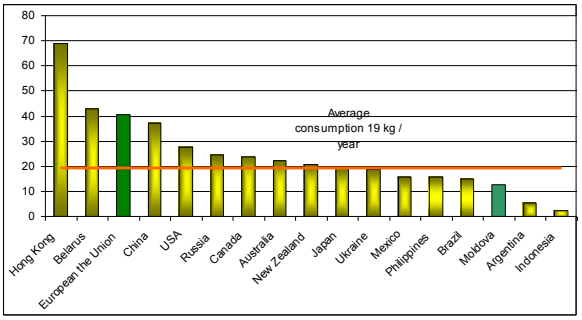


Fig. 2. The consumption of pork per person, kg / year Source: FARPI; [11]; [7]; [9].

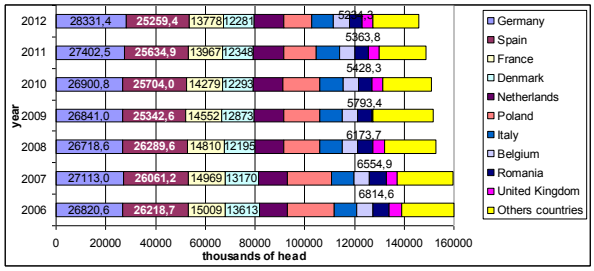


Fig. 3. The number of pigs in the European Union for the period 2006-2012. Source: EUROSTAT.

During the analyzed period is contracting the number of pigs in the European Union with 160046,2 thousand units in 2006 to 145828,6 thousand goals in 2012.

Table 1. The production of pork in the European Union for the period 2006-2012, thousand tons

Country	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
EuropeanUnion (27 countries)	21948,470	22819,236	22573,744	21279,458	22009,208	22387,294	21915,649
Germany	4662,221	4985,367	5114,319	5241,355	5443,166	5598,000	5459,000
Spain	3235,241	3439,442	3484,363	3290,571	3368,921	3469,345	3466,324
France	2262,789	2281,239	2276,678	2004,185	2010,326	1998,317	1597,359
Poland	2071,355	2090,618	1888,035	1608,238	1741,425	1810,778	1695,200
Italy	1556,059	1603,279	1606,013	1588,444	1632,715	1570,225	1620,719
Denmark	1748,576	1802,195	1707,400	1583,200	1666,300	1718,400	1603,700
Netherlands	1264,897	1289,935	1317,705	1274,980	1288,274	1347,165	1331,731
Belgium	1006,217	1063,277	1056,169	1082,036	1123,769	1108,255	1109,610
United Kingdom	696,549	738,984	739,602	720,253	772,346	805,679	824,637
Romania	468,100	491,300	455,100	222,070	234,195	263,329	282,094
Others countries	6603,880	6727,497	6655,438	5860,808	6101,911	6078,804	6241,194

Source: [8].

During the 2012 the EU was produced 21915,649 thousand tons of pork, compared with 2006 and 2011 lower by 1,2 percentage points and by 2,1 percentage points. The largest pork producers in the EU are Germany, Spain, France, Poland, Italy, Denmark, Netherlands, Belgium.

The main trade partners of the Republic of Moldova on the import of pork are mainly: Belgium, Germany and Poland. Also worth noting is that the Republic of Moldova pork

exports mainly to the United Kingdom and Russia.

According to the National Bureau of Statistics of the Republic of Moldova may be noted that as of 01.10.2012 in the Republic of Moldova, the number of pigs on farms of all categories was 439 thousand units, a decrease compared to the previous year by 8,2 percentage points (or 39 thousand units), with the volume of production of 63,9 thousand tons.

Analyzing the cost of 1 ton of pork the manufacturer, it may be noted that the domestic price of pork is slightly higher than the European or worldwide.This is due to increased volumes of products, losses in production, the high cost of feed and increasing import trade.

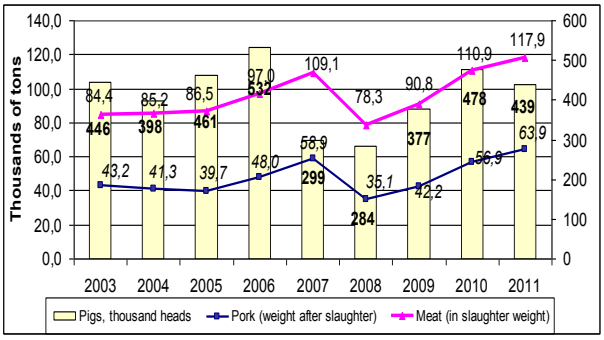
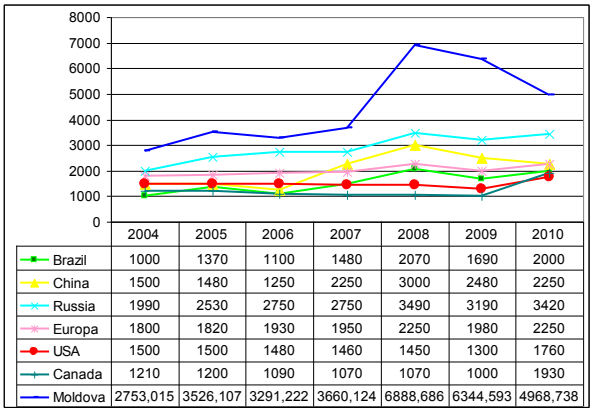


Fig. 4. The number of pigs and pork production in the Republic of Moldova, Source: [10].



	2004	2005	2006	2007	2008	2009	2010
Brazil	1000	1370	1100	1480	2070	1690	2000
China	1500	1480	1250	2250	3000	2480	2250
Russia	1990	2530	2750	2750	3490	3190	3420
Europa	1800	1820	1930	1950	2250	1980	2250
USA	1500	1500	1480	1460	1450	1300	1760
Canada	1210	1200	1090	1070	1070	1000	1930
Moldova	2753,015	3526,107	3291,222	3660,124	6888,686	6344,593	4968,738

Fig. 5. Changing the the price of pork in the period 2004-2010, U.S.A $ / ton. Source: [7], [9], [8], [10].

In 2007, restraining the growth of agricultural production on the background of the exhaustion of intervention stocks for the first time in many years has led to a marked reduction of such security, and a sharp rise in prices on the world market and the meat at the meat market of the EU (30% pork).

Fundamental differences in the technologies of growing pigs between the Republic of Moldova and the European Union do not. With respect to the EU have the same climate, the conditions for the animals and forage base. In Europe, the main diet feeding are cereals (70 percent), the rest - schroth oilseeds, vitamin group. But we have very different amounts of financial resources and fundamentally different rate of return. In Europe, the farmer can raise working capital is two to three times cheaper. And in our country, few businesses can afford to have an operating profit of more than 25 percent. The average loan rate in Moldova is as follows.

Of course, in South America, weather and climatic conditions allow to save on energy resources. In addition, there is a specific food base, based on the use of processed soybean products, corn, and sugar cane bagasse.

For stimulating agricultural producers the EU has powerful scheme. EU budget in 2012 amounted to 150 billion euros. To subsidize farmers spent about 50 billion euros of the EU budget (30%). And before 2000 was spent on subsidies to farmers and does up to 70 percent of the EU budget. Poland since joining the European Union is the largest recipient of European subsidies. In addition, still exist national programs to support agriculture. And the Republic of Moldova is simply not enough of GDP and the state budget revenues.

Pig production industry will continue to be a priority because of the important biological characteristics of animals as high precocity, fertility and feed efficiency per unit of production. [4]

The production of pork is planned to increase in all categories of -130000 to 150000 ton in the Republic of Moldova and the European Union before 83519 thousands tonnes in the number of pigs before 641938 thousand. Half of these volumes of production appropriate to provide primarily through the use of production capacity kept specialized pig farms, increase their capacity on the basis of the reconstruction and modernization of shops and sites. Great

attention will be given to the introduction of resource-saving technologies.

The strategic direction of the industry should be the creation of integrated agro-complexes, with completed cycle - the production of grain and feed, fattening pigs, processing and sale of finished products. This form of integration will alleviate the problem of supply relatively cheap complexes concentrated feeds. [1], [2], [6]

One of the first tasks in the industry is to recover the genetic resources of pigs that will allow for the production of meat in accordance with the current requirements of the market. The main role of this will belong to the public on scientific enterprise selection and hybridization of pigs «Moldsuinhibrid», created in 2003 by Government Decision. Its mission - to preserve the genetic resources of pigs world-class, use them to improve the productivity and breeding qualities of local breeding populations of pigs, as well as to produce, at the same time. [5]

It is necessary to create a complete tribal structure of farms (breeding center, breeding plants, breeding reproducers), which should contribute to the preservation and development of a resource pig.

CONCLUSIONS

From the investigations on the specificity and development srtategiilor swine meat sector in the Republic of Moldova and the European Union we can conclude the following factors that contribute to the future development of pork production:

-The high level of competitiveness of the primary phase of pork production (competence of the personnel and sufficient number of local and imported piglets for fattening);

-The use of modern technology and health standards at slaughter animals;

-The veterinary agreements with importing countries pork;

-Implementation and continuous improvement of the system to ensure the quality of products from primary production to its sales;

-The creation of economic conditions for the integration of pork producers and meat processing enterprises;

-Cooperation economic agents in order to create a functioning and processing facilities and fodder production.

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[11] http://faostat.fao.org/ Database of the World Food Organization (FAO).

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SOYBEAN PRODUCTION IN ROMANIA:STUDY CASE ON CONVENTIONAL AND FORMER HT SOYBEAN PRODUCERS

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Abstract

This paper is related with Romanian potential of soybean production and is based on idea that farmer's incomes on this culture can be significant. The paper is based on research survey conducted among farmers that produced soybean in their farms. The research area was selected in the South East part of Romania, where were recorded the largest HT soybean surfaces before 2007, the year when Romania joined the EU and the production of HT soybean was forbidden. Both HT soybean and conventional soybean farmers were interviewed. The results indicates positive attitude of soybean farmers regarding soybean production if new regulation regarding GM production are adopted at EU level, which can lead to higher cultivated areas with this culture.

Key words**:** *conventional soybean, farm level, GM production, HT soybean*

INTRODUCTION

As Bertheay said, soybean is the most important agricultural commodity traded around the world, both in terms of volumes and money, and this crop also shows the most important changes over the last decades by the predominance of genetically modified (GM) crops, dominated by herbicide tolerance traits, and its worldwide cultivation [1]. Romania started to cultivate GM crops in 1998 from technical and economical considerations. Romania cultivated for several years GM crops on areas larger than in many European countries and was ranked 11th largest GM crop growing country worldwide in 2004. Since then, soybean production in Romania has registered a continuous decline imposed by the EU interdiction to cultivate genetically modified cultivars even if soybean protein is imported in Romania, as in the other EU countries, in order to balance the diminished internal production [2]. Genetically modified HT soybean technology was attractive for Romanian farmers due weeds contribute significantly to reduced yields and to downgrading of crops sold because of the presence of weed material in deliveries to buyers and users. [3]. As Smale M. said [4], despite the fact that HT soybean is the predominant GM crop worldwide few studies analyse its social and economic impact.

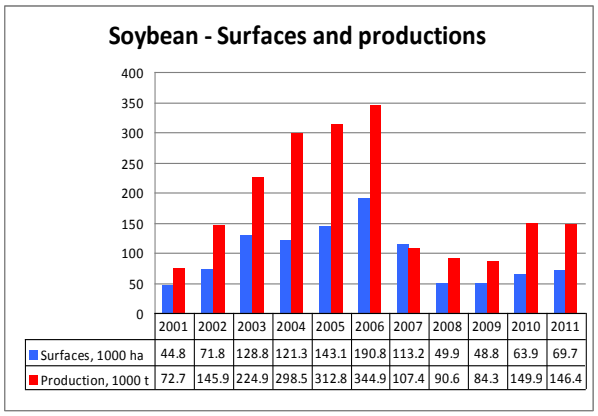
MATERIALS AND METHODS

The research method was based on face to face interview. A choice experiment regarding coexistence measures was carried out with all the farmers that accepted to answer. The soybean farmers that were interviewed during several rounds are situated in the areas of Brăila, Ialomiţa, Călăraşi, Teleorman, Giurgiu, Argeş, and Tulcea counties.

RESULTS AND DISCUSSIONS

GM soybean was the first crop cultivated in Romania. Its production was allowed until 2007, when Romania became part of the EU and adopted its regulations which not authorize GM soybean cultivation. Currently GM crop cultivation in Romania is allowed only for Bt maize, which was approved for cultivation since April 2007.

So we could get a clear image of what GM crop production means for Romanian farmers, we interviewed former GM soybean farmers, as well as their neighbors concerning their experience or point of view regarding GM cultivation and the costs of coexistence measures.It is to mention that regulations governing GMOs crops were first introduced in 2000 by Ordinance 49/30.01.2000 on obtaining, testing, utilization, and commercialization of GMOs. At the beginning of 2012 was published by the Ministry of Agriculture and Rural Development Romania an order regarding authorization and control of GM crop growers and measures to ensure coexistence of GM crops with conventional and organic crops (MADR, Ordin 61/26.03.2012). In order to establish a strict control on genetically modified crops and production resulted by cultivation of these crops, have been taken measures to ensure their traceability and labeling, in accordance with national and Community legislation in this field. The cultivation of GM soybean extended between 1998 and 2007, by each year. The official figures shows that in the last 3 years of authorized production, the GM soybean surfaces increased from 58 thousand ha in 2004 (from 121 thousand - total ha of soybean) to 87 thousand ha in 2005 (from 143 thousand - total ha of soybean) and then to 137 thousand ha in 2006 (from 190 thousand ha - total of soybean). (Fig. 1).



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Surfaces, 1000 ha	44.8	71.8	128.8	121.3	143.1	190.8	113.2	49.9	48.8	63.9	69.7
Production, 1000 t	72.7	145.9	224.9	298.5	312.8	344.9	107.4	90.6	84.3	149.9	146.4

Fig. 1. Soybean –surfaces and production in Romania

The GM soybean cultivation was attractive for Romanian farmers which faced with a high level of weeds spreading.

We selected 80 soybean farmers with a request to participate in an interview. From the initial list only 59 accepted to provide answers. Farmers were asked for their general knowledge, attitudes and perceptions towards GM crops and other new technologies, socioeconomic and farm characteristics, relation with neighbors, their experience with GM soybean, and the burden of coexistence measures.

Most of the farmers are situated in the South East part of Romania. The main farm type in our sample was arable farm (50), followed by mixed farms (9).

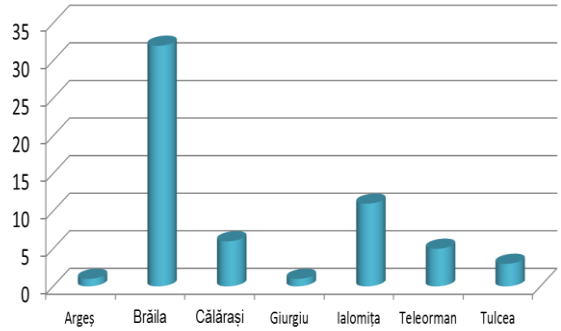


Fig. 2.The selected survey counties for soybean.

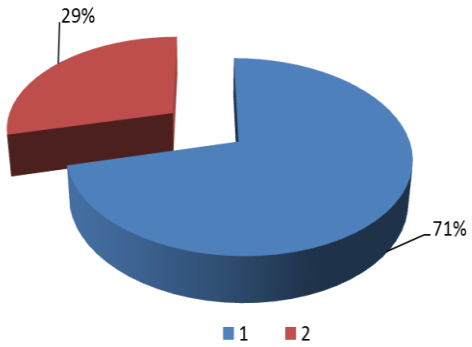


Fig. 3. Former HT and conventional soybean farmers

From the total of interviewed farmers, 42 cultivated in the past HT soybean, representing 71 % of them.

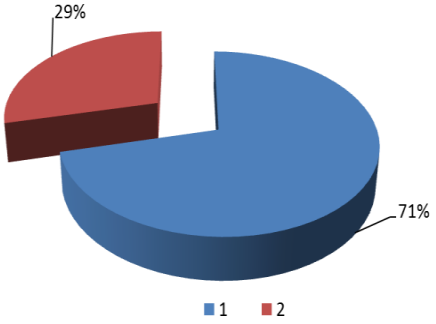


Fig. 4. The range between adopters and non adopters of HT soybean

The cereal and oilseed production provides the largest share of farm income in 48 farms. For other farms, besides the mentioned categories, large share of income are assured by vegetables and animal production. The average farm size was 820 ha, so we can conclude that our sample consisted more from large farm, compared with national average of 3.45 ha/farm (environ 3.8 millions of farms in Romania). The total area of these farms is 48.388 ha. Most part of the utilized agricultural area, of 34.882 ha (72 %, corresponding to an average of 591 ha/farm) is rented by farmers. In 2012, only 22 farmers cultivated conventional soybean. The average area cultivated by these farmers was 58 ha/farm. As regarding the constraints in reaching the highest yields, the water scarcity is considered to have the highest negative influence. The soil is appreciated to be of high quality by an important number of farmers (17, representing 28.8 % of them), while the weeds infestation is a major problem for 28 farmers (47.4 %). The pests are in the third position as a factor of low yields, while the seeds quality and the topographic factors seem not to be a problem, for most part of the farmers. It is to mention here that most of the farms are situated in the plain areas, with the most favorable conditions for agriculture from Romania. The crop losses from weed pressure (1=least significant 10= most significant) is considered very important by 45 farmers (20 of them consider this fact as the most significant factor which determinate crop losses in their field production)

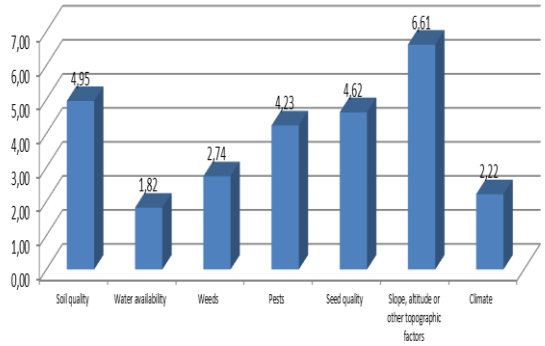


Fig. 5. The average media for each production influence factors

Table 1. Summary statistic for sample farm with soybean production

No. crt.	Characteristic	Sample statistic
1	Age	48.1 years
2.	Education	University degree in Agriculture (71.1 %)
3.	Job experience	17.3 years experience
4.	Farm size	820 ha
5.	Land rented	72 %
6.	People employed in farm	3.89
7.	Farm income/Profit	Most part bellow 20.000 Euro
8.	Area of conventional soybean per farm in 2005	1309 ha 22.1 ha/farm
9.	Area of conventional soybean per farm in 2006	275 ha (4.66 ha/farm)
10.	Area of Conventional soybean per farm in 2012	940 ha (15.9 ha/farm)
11.	Area of HT Soybean in 2005	2266 ha 38.4 ha/farm
12.	Area of HT Soybean in 2006	4661 ha 79 ha/farm

Source: Survey on soybean farmers, in the South East of Romania, 2012

The farmers were asked about the conventional soybean area harvested that they harvest in 2005, 2006 and 2012. In 2005 only one farmer harvested more than 200 ha of conventional soybean. Most part of the survey farmers that had soybean in production in 2005 have cultivated and harvested between 31 and 50 ha. In 2012, the HT soybean being prohibited, the number of farmers that cultivated and harvested soybean increased. If we compare the conventional soybean surfaces harvested by farmers in 2005, 2006 and 2012, we can see that in 2005 they harvested the largest areas of soybean.

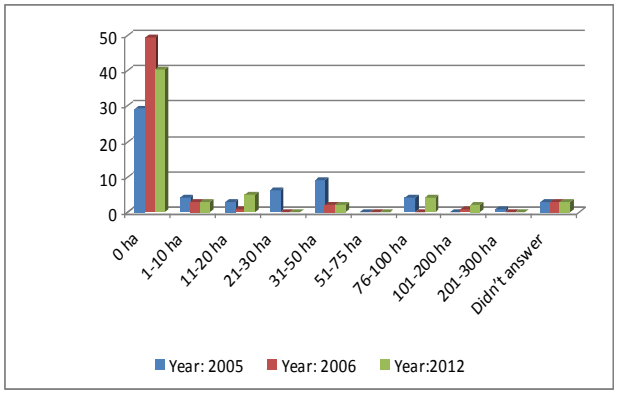


Fig. 6. Conventional soybean area harvested in 2005, 2006 and 2012

Most part of these farmers with HT production (9) cultivated between 31 and 50 ha in 2005. Also 7 farmers cultivated in the same year between 21 and 30 ha. In 2006 the surfaces of HT soybean per farm have increased. Most part of the farmers with HT production from our survey (11) cultivated between 76 and 100 ha.

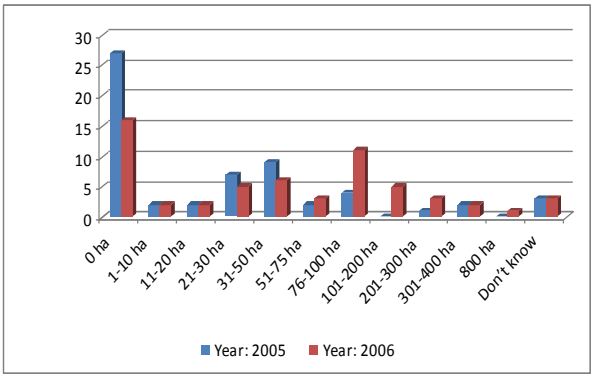


Fig. 7. HT soybean area harvested in 2005 and 2006

CONCLUSIONS

For the soybean farmers, HT soybean is considered as viable solution for their future plans of production.

Most of them consider coexistence cost to be not significant in relations with the benefit of reintroducing of this type of crop in production.

In Romania farmers had coexistence cost related with obtaining of production authorization, and which involved several visits to the different national or local institutions in charge with this aspects.

Soybean is a self pollinated plant that doesn't require special measures in production. The cost of coexistence appears for farmers at harvesting, but starting for this point, the cost are related with the others commercial partners from the market.

ACKNOWLEDGMENTS

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COMPUTER MODEL USED TO CALCULATE PROFITABILITY AND ECONOMIC RISK ON FARMS

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Abstract

Economic information is an essential element of progress, being present in all fields. With the development of market economy must grow and economic information in order to reflect as accurately as patrimonial situation and results of financial and economic activity of enterprises. The main source of economic information is the accounting, which is the main instrument of knowledge, management and control of assets and results of any enterprise. In this paper we present a computer model to analyze economic information on the profitability and economic risk, available both in the vegetable farms and for the livestock sector.

***Key words*:** *agriculture, economic risk, income, information systems, profitability*

INTRODUCTION

Information systems for farms aim to support agricultural business in an original and easily accessible, providing information for effective management and efficient organization of farm work [3].
In Romania are becoming more progress in agriculture, an area with much potential. These steps must be taken by a uniform policy through effective rules and technological modernization of agriculture programs that support growth of labor productivity, level of education and skills and the development of products farmers marketing channels.

MATERIALS AND METHODS

Underlying computer models to develop any system and is characterized by a life cycle that begins with the decision of putting together a new system to better meet new user requirements and ends with the decision to replace the existing system with a new more efficient. The life cycle takes place in stages, each stage being defined phases and specific activities[5].
There is a range of approaches to developing computer models. There is a methodology to ensure success of the model. Choosing a methodology for a particular model depends on a number of factors, from the size of the system, criticality of up to factors such as environmental dynamism and organizational culture. The information proposed in this paper is based on a type Methodological Development Rapid Application Development (RAD), which uses minimal planning in favor of making prototypes. Lack of excessive planning generally allows writing code faster and easier changing requirements [10]. RAD involves methods like iterative development and software prototyping and can be seen as a merger of various structured techniques, especially data-driven information engineering, with prototyping techniques to accelerate software systems development.
Development of a new computer model, and then the computer system must be in an early stage of the project to ensure that all functionality can be implemented. In this case, those based on phase are useful in this situation as they provide technology to investigate the possibility to design the end phase [13].

RESULTS AND DISCUSSIONS

Any modern agricultural unit, regardless of size, shape, profile property and socio-economic space in which operate, requires a management style based on flexibility, dynamism and foresight, which is inconceivable without an operative information, complex and quality to provide the basis to take decisions [2]. The continuous development of computer technologies designed for agriculture can have a real impact on improvement of productive activities and agriculture efficiency. Actually, a computer system may become a viable tool in agriculture management process [4].

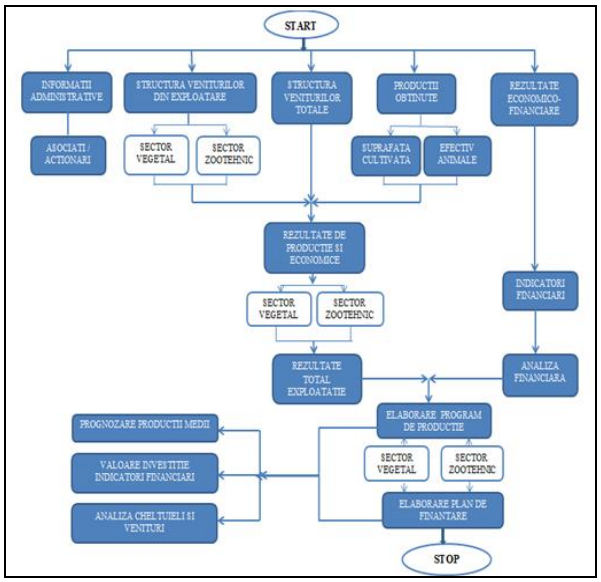

Fig. 1. Flowchart - computer information flow model proposed

I. Flow of information - data entry

In the proposed model the input data will consist of administrative information (general information about farm), information about the structure of operating revenue (MDL) sectors, respectively natty total income structure (MDL) and acreage information about different types of crops (ha) and livestock (number of heads) and obtained production (tones, liters etc.).

Assessment of profitability of an enterprise, using the information in the financial statements involves measuring wealth at a time and during its enrichment and risk assessment of "illiquid" and maintaining the company's capital.

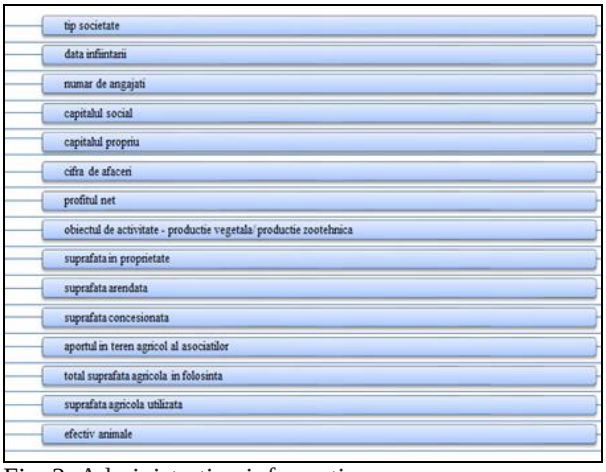

Fig. 2. Administrative information

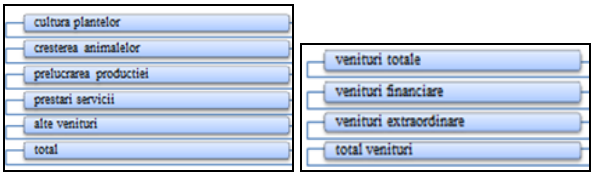

Fig. 3. Breakdown of operating revenues (Ron) sectors / structure total revenues (Ron)

Fig. 4. Acreage/livestock and yields obtained

Under the current economic and financial planning and accounting, profitability indicators are [12]:

-Indicators reflecting net profitability (net profit, return on net) profitability analysis allowing only the total activity of the economic entity;

-Indicators reflecting gross profitability (gross profit, gross rate of return) that facilitate profitability analysis at the level of total business unit and the types of activities or the entire chain organizational structures as well as each product.

The balance sheet is the main source of information, which is based on economic and financial analysis. Balance heritage provides information on assets, liabilities and equity, enabling evidence modalities of financial balance short and long term.

Analysis of internal and external financial balance sheet is to determine a diagnosis on profitability and financial situation and future of society [1].

Fig. 5. Economic-financial results (to be taken from the balance sheet)

Regarding asset items are presented in the balance sheet net of the gross value corrected resulting from impairments observed with continued exercise. Equity is included in a broader category ie permanent capital, which expresses all the sources of finance available to a business. Determining the optimal size of permanent capital is a particular problem in financial management as a possible impairment of long-term sources of liquidity and solvency influence on its profitability.

Profit or loss is the basic source of information to characterize synthesizers profitability as a form of enterprise performance. Profit and loss is the image output of the enterprise to measure business performance by addressing the economic profit, ie the difference between revenues and expenses. The measured performance of a business enterprise during a given period of three ways:

-In terms of *heritage*, by comparing the value of an enterprise on two different times using the same evaluation methods;

-In *economic* terms, the deduction of income, both relating to the same period;

-In *financial* terms, net of amortization of net cash flows.

By providing information explaining the composition of benefits - revenues, expenses, gains, losses - balance actually highlights relationships between these components. Profit and loss will permit assessment of performance indicators: turnover, namely production year, or indicators can be constructed from the information in this document: commercial margin, value added, gross operating surplus by doing the preparation intermediary balance management.

Structure has the advantage of expenses by nature and year of production determine the value added to the enterprise level indicators are placed in the center of profitability analysis. Profit and loss forecast values provides the necessary information and calendar companies' ability to generate cash flows.

Cash flow statement is more used in providing the relevant information on receipts and payments of an enterprise during an exercise to help users of financial statements to assess solvency. Cash flow from operating activities is, in fact, the central indicator of a company situation analysis.

Breakeven reflect the size of the business in which the revenue from sale of goods are equal to the costs (variable and fixed workload related debt), the profit is zero. In conclusion, operating breakeven is where the operating revenues cover operating expenses and operating result is null. After this threshold, the operating activity becomes profitable.

In relation to the dynamic workload of expenditure items are classified into fixed and variable. Variable costs are constant in size per unit (their amount increases with the volume of activity) and fixed costs are variable per unit (their total amount is constant, means that they are reduced while increasing the workload by increasing the degree of utilization of the production capacity). This link between the amount of operating expenses and the workload to be achieved, so sales revenue to cover expenditure incurred is reflected by the profitability threshold [11].

The point of breakeven (neutral) and increase the dead point to the value of 365 days express increased risk of exploitation. From statistical studies deduced that the firm is in a situation:
- Unstable when neutral exceed 304 days ;
- Stable when neutral is between 183 and 304 days;
- Comfortable, when the neutral is more than 183 days.

II.Flow of information - data output

Gross margin (MB) of the difference between the culture crude product (PB) of crop / livestock effectively and expenses proportionally (ChDP). Gross margin is calculated per unit of activity: area (1 ha) and livestock.

$$MB = PB – ChDP$$

The crude product (BP) is the sum of the main output value (PPV) and the second output (VPS), to which was added specific grants (SS) for the crop.

$$PB = VPP + VPS + SS$$

where,
-VPP is obtained by multiplying the selling price at farm level, the output obtained
-VPS secondary output is obtained by multiplying the sale price obtained at the farm level,
- SS are given both farmers and farm level by observing certain criteria.

Direct expenses proportionate (ChDP) are expenses that vary directly with changes in the size of agricultural production (fertilizer costs, seed, feed etc.). These expenses may come in direct proportion purchased inputs (pesticides, fertilizers) or own inputs (eg seeds or concentrated animal consumed on the farm). These values are calculated to estimate the sales price of the farm.

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Besides the direct costs at the farm level, there are overheads, which in turn can be proportional (ChGP) and disproportionate (ChGN).

A proportionate cost at the farm level is the cost of water and electricity.

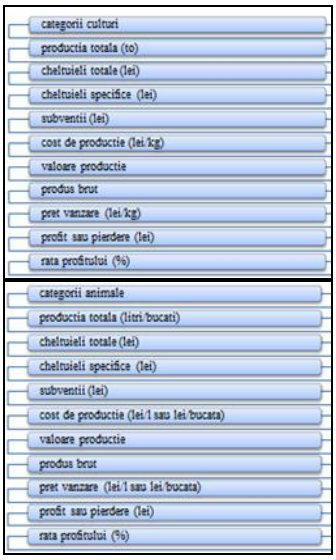

Fig. 6. Results of production and economic results - the vegetable / livestock

Disproportionate overheads are those that remain unchanged whether or not there is a production activity (eg permanent workers employed expenses, costs of machinery, equipment, buildings).

Overheads with direct costs are total costs at the farm level and general expenses (proportional and non-proportional) with disproportionate direct costs are sometimes called fixed expenses (ChF).

$$ChF = ChGN + ChGP + ChDN$$

Profit is calculated at farm level. If the total income of the farm are greater than total expenses, the firm is profitable. Gross profit is calculated by the difference between total revenue (VT) and total expenditure.

Gross profit = total revenue - total expenses

The gross margin level of manufacturing activity can be formulated as follows:

$$(MB)_i = (PB)_i – (ChDP)_i$$

where:
$(MB)_i$ = gross margin ,,i" business
$(PB)_i$ = product ,,i" activity
$(ChDP)_i$ = Variable expenses related to the ,,i" activity.

If you know which is the gross margin level of manufacturing activity (MB) and the profit can be calculated at farm level, the difference between the amount of gross margin and fixed costs of all activities of the farm.

Gross profit = VT – ChDP – ChF

Total gross margin (amount MB activities) is a measurement used to describe the benefits for a particular farm as a whole.

Total gross margin is computed by summing the activities of all the holding, ie:

$MB = MB_1 + MB_2 + ... + MB_i = \sum MB_i$

Gross profit = $\sum MB_i$ on activities – ChF

Fig. 7. Overall results per total holding

Bankruptcy risk. Bankruptcy risk analysis is essential for any company that feels worsening financial situation, but can not specify the time when it comes to bankruptcy. A simple calculation can prevent many ailments and can provide long before worsening economic and financial situation [6, 7, 8, 9]. To analyze the bankruptcy risk scores are used method - this method is presented in several versions, depending on the analysts who prepared it, namely *Altman method* and *Canon and Holder method* [6].

a. Altman method uses a score function "Z" constructed:

Z= 3,3 x T1 + 1,0 x T2 + 0,6 x T3 + 1,4 x T4 + 1,2 x T5

where:

T1 = economic rate of return = (gross profit/total assets) x 100

T2 = coverage of income assets = (total revenue/total assets) x 100

T3 = coverage of total debt on account of reinvested profit = (Equity/Debt) x 100

T4 = economic rate of return expected on account of reinvested profit = (reinvested earnings / total assets) x 100

T5 = current assets to total assets ratio = (current assets/total assets) x 100

Interpretation of results:

• Z <1.8 → critical situation for bankruptcy

• Z> 1.8 and Z <3.0 → risk of bankruptcy is in a normal margin,

• Z> 3 → risk of default is minimal.

b. Conan and Holder B. Method is based on the following function:

Z= 16 R1+ 22 R2 – 87 R3 -10 R4+ 24 R5

where:

R1 = partial liquidity ratio = (current assets - Inventories)/Current x 100

R2 = financial stability rate = (permanent capital/total liabilities) x 100

R3 = rate of financial expenses (financial expenses/turnover) x 100

R4 = rate of remuneration for staff (staff costs/value added) x 100

Interpretation of results for Z:

• <0 → bankruptcy probability > 80%

•75-80%→ failure probability 0-1.5

•70-75%→failure probability 1.5-4

•4 to 8.5 → 50-70% probability of bankruptcy

•35-50%→ failure probability 8.5-9.5

•30-35%→ failure probability from 9.5 to 10

• > 16 → 10% probability of bankruptcy

Fig. 8. Financial indicators

CONCLUSIONS

Creating integrated systems based on computer models allow a coherent viable

agricultural activities and high control economic information used.

Information provided by the annual financial statements relate to the past and the decisions to be taken concern the future. Not integrating phenomena of price leads to a distorted presentation of reality. Some information from the annual financial statements are subjective (eg, information on the net tangible assets and depreciation, which depend on the duration of use retained). There is useful information for analyzing profitability, but they are not provided because they can not be quantified in money, and other information of interest though and can be measured, are not included in the summary documents as they generate competitive disadvantages.

The continuous development of computer technologies designed for agriculture can have a real impact on improvement of productive activities and agriculture efficiency.

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INFLUENCE OF HUMIC NATURE SUBSTANCES (LG) ON THE POLYPEPTIDE POLYMORPHISMS OF SOME GLYCINE MAX L. SORTS WITH DIFFERENT RESISTANCE TO DROUGHT

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Abstract

The content and quality of proteins are genetically determined characters. Individual complex of soybean proteins determines the economic values of the species. In order to identify the particularities of plant response to humic compounds, the polypeptide spectrum of soybean proteins extracted from seeds of two varieties with different drought resistant was analysed. The comparative analysis of protein spectra of extracted proteins from beans of the control plants highlighted the presence of common polypeptides to both studied sorts, and the presence of specific polypeptides for each genotype with a varying amount share appreciated through colorant intensity and band dimension. Protein spectra included polypeptide bands with molecular mass comprised between 106 and 20 kDa. Notable qualitative differences between polypeptide pattern of genotype with medium resistance to drought (Horboveanca) and those resistant (S4-04) were detected at the polypeptide level with Mr 104, 60, 43 kDa, present in resistant genotype and absent in medium resistant. Under our previous research was established that treatment of seeds with humic compound (LG) significantly increase productivity of soybean plants growing under field conditions, which determined substantial changes in the protein content and enhance grain biomass. From the reported data we conclude that the chemical compounds such as humic compounds may influence production potential of soybean and resulted substantial changes in the protein complex of the plant.

Key words**:** *biologically active substances, drought resistance. soybean, soybean proteins*

INTRODUCTION

Soybean (*Glycine max* L.) is an important source of protein for human and animal nutrition. The quantity of soy protein in the environment can vary from 38-42 % [14]. Soybean proteins can be distinguished by the structure and function, amino acids composition, the content of nitrogen, sulfur, phosphorus and molecular weight of the components [2,20,21], being composed especially in globulin and insignificant quantity of albumin. The content and quality of proteins are genetically determined characters. Individual complex of soybean proteins determines the economic values of the species.

Representing one variable strongly influenced by environmental conditions, genetic potential of plants could be improved with the help of some physiologically active substances [6,17,18,22,23]. The data from the literature relates about the possibility of using such humic compounds in the process of plant growing for the purpose of resistance modulation and to increase their productivity. Mechanism of action and role of these compounds in plants is diverse and incompletely elucidated [14].

MATERIALS AND METHODS

In order to emphasize the response reaction and particularities detection of soybean protein spectrum, it was analyzed the polypeptide pattern of extracted protein from beans of two species with different resistances to drought and treated with humate solution (LG) in a concentration of 0.5 and 0.1 % and grown under field conditions. In the study was used genotypes Horboveanca – with medium resistance and S4-04 – resistant to drought. Extraction of total soluble protein was carried out in Tris-HCl buffer solution, 6.25 mM

pH=6.8. Protein precipitates were dissolved in Tris-HCl buffer solution (pH=6.8), contained SDS – 4.25 %, sucrose about 20 %, β – mercaptoetanol – 6% and bromophenol blue – 0.004 %. Protein electrophoresis was performed in the system of Laemmli tampons, in the polyacrylamide vertical plates with 1mm thickness, under denaturing conditions and post electrophoresis operations were carried out according to the standard method [8].

For the determination of relative molecular mass of separated polypeptide fractions were used protein markers with known molecular weight: carbonic anhydrase – 29 kDa, ovalbumin – 45 kDa, bovine serum albumin – 67 kDa and phosphorylase B – 97.4 kDa.

RESULTS AND DISCUSSIONS

The main protein reserve in soybeans are represented by glycine (globulin 11 S) and β-conglycine (globulin 7 S) that representing approximately 70 % of total protein deposited in beans [7]. Glycine is composed by acid subunits with molecular weight approximately 45 and 38 kDa and base subunits with the Mr 22 kDa, and β-conglycine is composed by major subunits α, α and β, subunits with 76, 72 şi 48 kDa [19].

The comparative analysis of protein spectra of extracted proteins from beans of the control plants highlighted the presence of common polypeptides to both studied sorts, and the presence of specific polypeptides for each genotype with a varying amount share appreciated through colorant intensity and band dimension. Protein spectra included polypeptide bands with molecular mass comprised between 106 and 20 kDa (Fig.1).

SDS-electrophoresis revealed the presence of some polypeptides with high content in electrophoresis gel (Mr 88, 79, 73, 53, 41, 35, 32, 29 kDa) common to analyzed genotypes, the maximum intensity which is attested in the three bands corresponding to the polypeptide with Mr 79, 73, 35 kDa. Major quantitative differences between polypeptides spectra of the witnesses were confirmed, especially, at the level bands which corresponding to polypeptide with molecular mass ≈ 88, 32–29 şi 20 kDa, Mr 88 and 29 kDa polypeptide with a more pronounced expression in the resistant sorts and polypeptide with the Mr 45, 35, 32 and 20 kDa – genotype which has an medium resistance.

Notable qualitative differences between polypeptide pattern of genotype with medium resistance to drought (Horboveanca) and those resistant (S4-04) were detected at the polypeptide level with the Mr 104, 60, 43 kDa, present in resistant genotype and absent in medium resistant.

The relevant differences between control variants and studied genotype were found in the bands with the Mr 88 kDa, 79 kDa, 73 kDa, 53 kDa, 32 kDa, 29 kDa, 20 kDa, from that polypeptides with the Mr 88, 79, 73, 53 and 29 kDa have more intense expression of resistant genotype S4-04 compared to the medium resistant - Horboveanca. Biosynthesis intensification of proteins with the Mr 29 and 70 kD was attested to the action of different types of stress – heat, salt and oxidative, changes in protein metabolism constitutes an adaptation type at the molecular level [24,25,26,27]. It is know that polypeptide with the Mr 29 kDa plays a key role in plant reaction to stress and the Mr 70 -73 kDa polypeptide represent heat shock proteins being codified by the gene HSP70 [11,28].

A significant number of data shows that stress proteins have an important role in the cellular protection and in rapid reestablishment of an initial cellular metabolism after removing of stress action [1,3,4,9,10,11,16]. From those observed we mention the presence of larger quantities of polypeptides with the Mr 104, 88, 60, 43, 29, 26 kDa at resistant sort and the absence or presence in small quantities of them with the medium resistant sort to drought which demonstrates that drought may be caused by synthesis capacity of stress proteins by genotype under normal conditions of cultivation, resistant sort to drought being characterized by more emphasized protein polymorphysm. The result obtained are in compliance with the some authors data which mention that resistant sorts to hyperthermia synthesize a greater amount of PST in

chloroplasts and mithocondria [5] or demonstrate a greater variety of polypeptide composition under heat stress [26].

In previous research conducted by us on the some parameters with the determinant role in the biological potential manifestation of plants was established that treatment of seeds with 0.5 % solutions LG significantly increase productivity of soybean plants growing under field conditions, determining substantial changes in the protein content and enhance grain biomass about 13-14 %. For these reasons, presents interest changes produced by substance administration in this concentration.

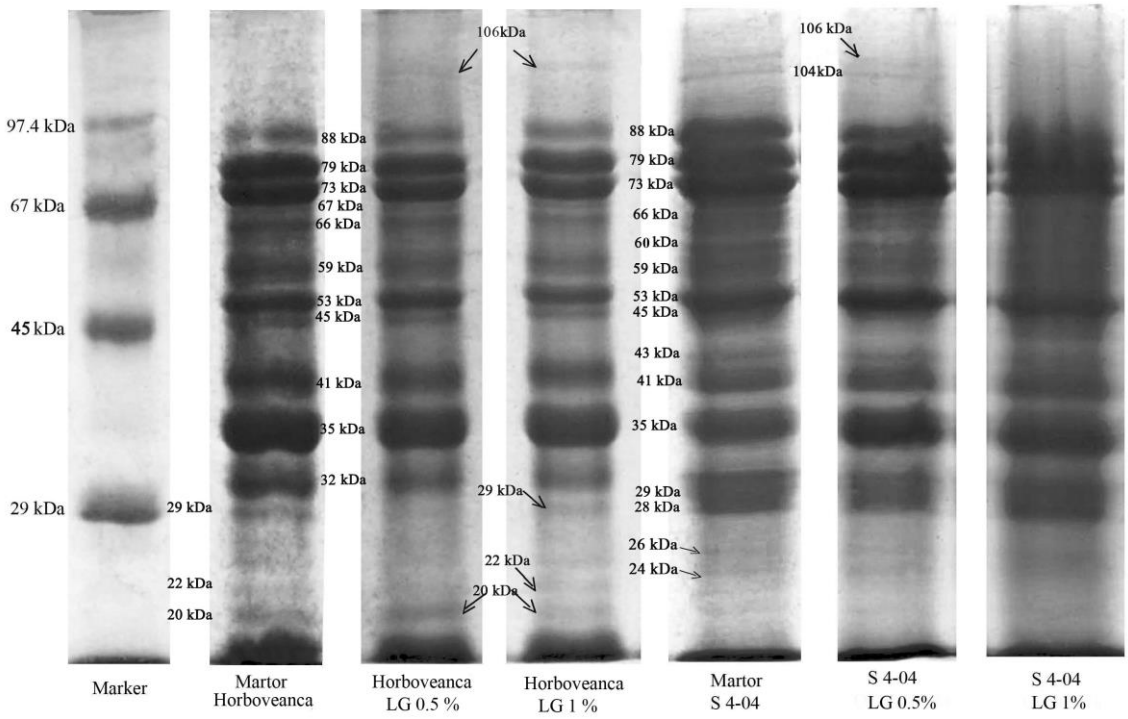

Fig. 1. Electroforeograme of extracted soluble proteins from soybeans subjected to treatment with humic substances (LG)

The polypeptide patterns of treated sorts with humic nature substances (LG) demonstrated a general spectrum of protein bands with a similar molecular weights diapason of witness variants.

However, treatment of seeds before seeding with the humate determined diverse quantitative and qualitative changes in the protein extracted content from harvested beans.

The treatment with LG resulted in band expression with the Mr 106 kDa, polypeptide color intensification with the Mr 20 kDa and also reduction of band content with the Mr 29 kDa in the case of Horboveanca sorts. S4-04 sorts responded to treatment by intensifying bands with the Mr 79, 73, 53 and 35 kDa and through reduction content of the band with the Mr 22 kDa. The 41 kDa, 22 kDa and 32 kDa polypeptides were expressed as medium resistant sorts while for better resistant sorts were expressed polypeptide with the Mr 28 kDa and polypeptide with the Mr 26 kDa.

According to the data from the literature, polypeptide with the Mr 26 kDa correspond to the osmotine and represents a responsible protein for adaptation of plants to osmotic stress, and the 22 kDa bands corresponds to class IV for proteins responsible for adaption to heat shock, codified by HSP22 gene [10,11].

This protein results from the precursor with the Mr 26 kDa, from which as a result of post-translational modifications is removed polypeptide with the Mr 4 kDa, and resulting PST with the Mr 22 kDa [12].

CONCLUSIONS

From the reported data we conclude that the chemical compounds such as humic nature may influence production potential of soybean, determining substantial changes in the protein complex of the plant. Response to chemical treatment is determined by genetic character of the sorts. Under optimal conditions of cultivation for the resistant sorts is characteristic the presence of a varied number of stress proteins in harvested seeds.

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GREEN ECONOMY - THE ECONOMY OF THE FUTURE

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Abstract

This paper defines the concept of "green economy", presents the main international organizations that deal the green economy. Are provided details of the most significant principles, objectives and actions of the concept of green economy. At the European level there is "The 2020 strategy ", which shows that Europe's economy should be an economy that knows how to manage resources efficiently and reduce carbon emissions. There are currently a number of basic laws for the green economy. Forest ecosystems are part of the green economy and the forest products industry are very important because they are renewable, recyclable and biodegradable. Thus forests are a fundament of the green economy, the goods and services are important components.

Key words**:** *ecology, forest plantations, green economy, sustainable development*

INTRODUCTION

The concept of green economy, was launched by the United Nations Environment Programme (UNEP), in late 2008 and is an alternative to economic growth and improving people's lives in compatible ways _ with sustainable development. Green Economy improves the human and social welfare, while significantly reducing environmental risks and ecological deficit.

At the European level a number of international organizations also discussed the transition to the green economy (EC, UNEP, OECD). In 2008, UNEP launched the "Green Economy Initiative to Get the Global Markets Back to Work" initiative aimed at focusing the global economy towards investments and clean technology. [1]

UNEP defines a green economy as one that results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP 2010). In its simplest expression, a green economy is low-carbon, resource efficient, and socially inclusive. In a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. [2]

The concept of sustainable development appeared at the end of the twentieth century, and involves bringing together two parallel realities: the economic activities and ecological mechanisms.

The European Union defines sustainable development as being _ the determination of the people for a better quality of life for all, for present and future generations.

Sustainable development requires a harmonious combination, as well to ensure simultaneously progress on four fronts: economic, social, ecological, hence the idea that the overall objective of sustainable development is to find an optimal interaction between the three systems.

European Sustainable development is a vision of progress that links economic development, environmental protection and social justice, the values that are recognized and enforced by democratic governments and political movements around the world.

The world economy has increased seven times between 1950-2000, and the world population has grown unprecedented 2.5 miles 6.1 billion people, along with raising the standard of life [3]. In October 2011, the world population reached 7 billion people, and the UN

estimates for 2050 the planet's_ demographic evolution will be _ 9.2 billion inhabitants. Therefore, some changes are needed, particularly in the economic sphere, which will be connected to current environmental conditions. Elaboration of a new model of development of human society based on increasing biocapacity by the widespread introduction of sustainable farming practices and production activities in line with sustainable development could maintain a balance between ecosystem integrity and long-term productivity.

Our sources of food are represented by four major ecosystems: forests, grasslands, farmland and fisheries. Their inadequate management has many adverse consequences on nature and climate. Climate change is one of the most serious challenges for humanity. The EU is seeking to adopt a global agreement on reducing emissions of greenhouse gases and open new avenues in the fight against climate change through actions initiated. Combustion levels increased significantly in recent decades, in 2010 the level was 4 times more than in 1950. In December 2008, EU leaders made a decision of special significance, approving a package of measures to reduce greenhouse gas emissions by at least 20% by 2020 (compared to 1990), increasing the share of renewable energies 20% and reducing energy consumption by 20% (compared to currently projected figures). [4]

Green economy aims at sustainable management of environmental resources, based on the belief that our biosphere is a closed system with finite resources and a limited capacity for self-regulation and self-renewal. Since we depend on the natural resources of the earth, appears necessary to require a new economic system that respects the integrity of ecosystems. However, the green economy concerns social justice, based on the belief that culture and human dignity are precious resources that, like our natural resources requires responsible stewardship to avoid their depletion.

Within UNEP, the Green Economy Initiative includes three sets of activities: [5]

- Promoting the **Green Economy Report** and related research materials, which will analyse the macroeconomic, sustainability, and poverty reduction implications of green investment in a range of sectors from renewable energy to sustainable agriculture and providing guidance on policies that can catalyze increased investment in these sectors.
- Providing **advisory services** on ways to move towards a green economy in specific countries.
- Engaging a wide range of **research**, non-governmental organizations, business and UN partners in implementing the Green Economy Initiative.

Adapting the economy so that progress is not detrimental to the environment is not essential just for _ long-term sustainability, but also for the quality of life. It also offers opportunities for new jobs requiring new skills. Europe in this way has a chance to be a leader, becoming the reference point for expertise in green technologies. And environmentally sustainable economic growth can be measured by productivity growth, accompanied by a reduction in emissions, so to combat climate change, and a massive increase in the percentage of energy from renewable sources.

Among the most significant principles, objectives and actions of the concept of green economy include:

- equity and fairness, both inside and between generations;
- consistency in sustainable development;
- a precautionary approach to environmental and social impact;
- an appreciation of the natural and social capital;
- efficient use of sustainable resources and consumption and production;
- matching existing macroeconomic objectives through the creation of green jobs, eradicating poverty, increasing competitiveness in key sectors.

As shown in Figure 1, the green economy means economic environment with less harmful effects on the environment and substantial benefits on society and each

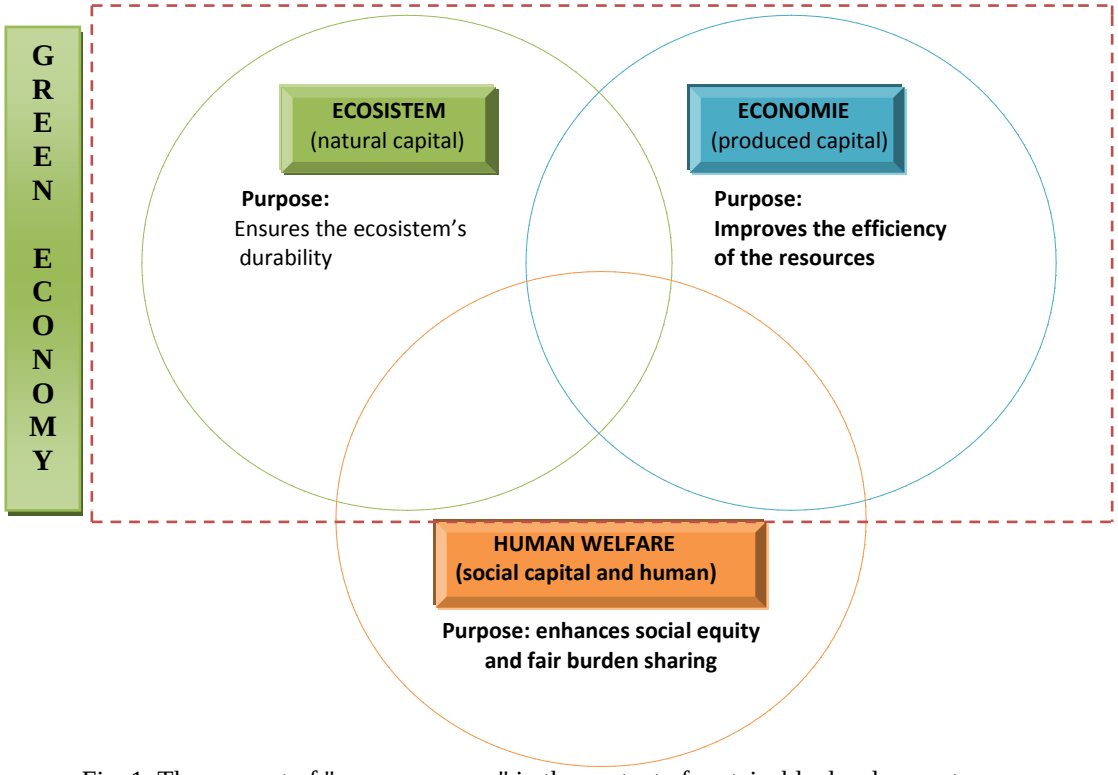

Fig. 1. The concept of "green economy" in the context of sustainable development

individual, while promoting sustainability and growth.

The green economy is based on six main sectors and production, within them, it must be done in a responsible way: energy from renewable sources (solar, wind, geothermal, wave marine, biogas), construction of green buildings, "clean "transport (use of alternative fuels, transport, hybrid and electric vehicles), water management, waste management, land management through organic farming, conservation, habitat restoration, reforestation and soil stabilization through sustainable forestry. [6]

Karl Burkart defines a green economy as based on six main sectors: [7]

1. Renewable energy (solar, wind etc.).
2. "Green" constructions (ie building LEED - Leadership in Energy and Environmental Design);
3. Alternative fuels (electric vehicles, hybrid or alternative combustibles);
4. Water management (water treatment systems, rainwater collection, etc..)
5. Waste management (recycling, storage etc.).
6. Territory management (including organic agriculture, habitat conservation, a forestation in urban parks, reforestation and land stabilization).

Also exists the 7th category that is called "green markets" and includes markets such as "green banking and financial investment services","carbon trading".

Currently the Strategy "Europe 2020", which aims at transforming the EU into an economy that knows an efficient resourse management and reduces carbon emissions, provides a durable response to challenges they will face in 2050. It aims to fully integrate sustainability and increase its role in public policy. To this end, the strategy defines the priorities are mutually supportive in favor of smart, sustainable and inclusive growth, supported by five major objectives:

1.Employment: the employment rate of the labor force of 75 % in the population aged between 20 and 64;

2.Research and development: 3% of EU GDP to be invested in research and development;

3.Climate change and sustainable energy use: the objectives "20/20/20" climate and

energy that a 20% reduction in emissions of greenhouse gases, 20% of energy consumption to come from renewable sources and 20% improvement in energy efficiency to be achieved (reducing emissions can rise to 30% if the appropriate conditions are met);

4.Education: dropout level should be reduced to 10% and increasing to 40% the share of graduates among the population aged 30-34 years;

5.The fight against poverty and social exclusion: reduce by 20 million the number of persons threatened with poverty.

From 2010 _ started the classification of the business in the green economy _ , classification bearing the name of' "Green Business Awards" and each year designates a winner based on several criteria including profitability of the enterprise and other economic indicators, but the core criteria are considered those related to the development of the technology. Examples of good practice in the green economy are:

-Uptown Oil company in London , UK, who developed a whole system that produces 100 % organic bio- diesel and sunflower oil;

-Green roofs are gaining more ground in modern architecture and are not just a trend of aesthetics, but presents undeniable benefits both economic and environmental.

-In Germany, at this time, 10% of all roofs are green and Switzerland legislative rules require that any new roof built more than 500 square meters, to be built using such a system. In Romania the market is still at the beginning and the companies in this sector are relatively few, which may mean that there is still opportunity for market penetration and the fact that the demand for such construction is low due to the building structure.

-Walney Offshore wind farm is developed by the Danish company DONG Energy in western Britain and was named the most profitable "green" business. It differs from other wind farms that it is located in the middle of the sea and that it is the largest wind farm in the world, with 102 turbines which will add another 51 in the coming years (it has the capacity to power 320,000 housing supply).

-Basic laws of the green economy:

Any science operates under terms and concepts and reaches maturity to establish or discover the laws which govern it. Given the "explosion" content issues, accentuated in a relatively short time, for environmental economics (environmental engineering and global ecology) the making of the laws that govern it we're made quite late and their enunciation is due to Barry Commoner.

First law: *all components of an ecosystem are interdependent with each other.*

This law reflects the existence of a complex network of reciprocal links in the ecosphere: between different organisms, and between populations, species, individual organisms and their physical and chemical environment. The interdependence of the constituent elements of the ecosphere determines a balance between them. From this trend continues the self balance within the ecosphere by certain functions that they perform various connecting elements.

The Second Law: Every excessive element in an ecosystem moves in a course of action consistent with the properties that it creates a certain or certain functions. It is obviously free formulation in accordance with the requirements of ecology, the law of conservation of matter and energy in physics that says that matter and energy are indestructible. Applied to environmental economics, the law emphasizes as in nature there is no "waste". In all natural systems, which excreted a body as detritus is used by another as food. Fauna releases carbon dioxide as respiratory detritus, this gas is, however, a _ nutrient for growing flora. Plants give off oxygen detritus used as a substance essential to maintain life by fauna. Organic waste bacteria feed on decaying animal. Their waste - organic substances: nitrates, phosphates, carbon dioxide - are consumed by algae etc. So this law says, in fact, everything that exists in nature are closely linked.

Third Law: Any external intervention caused by a disruptive element in a natural system it is harmful to the system.

According to the previous law in an ecological cycle can not accumulate waste

because nothing is wasted. A creature that is part of nature, in an ecosystem can not by its own biological activity, contribute to ecosystem degradation. Ecosystems are always subjected to external stresses. Man pollutes the environment only because he changed the cyclical, closed network in which includes all the other creatures.

The relationship between forest ecosystems and the green economy

Through the products we provide, forest ecosystems are an integral part of the green economy because the forest provides shelter_ jobs, clean water, income and regulates climate. Forest goods and services support economic livelihood of over 1 billion people_ most of them being in developing countries. Forests support more than 50% of terrestrial species, regulate global climate through carbon storage and protection of water catchments.

The products from the forest industry are very important because they are renewable_ recyclable and biodegradable. The forests are a cornerstone of the green economy, goods and services are important components of its forest.

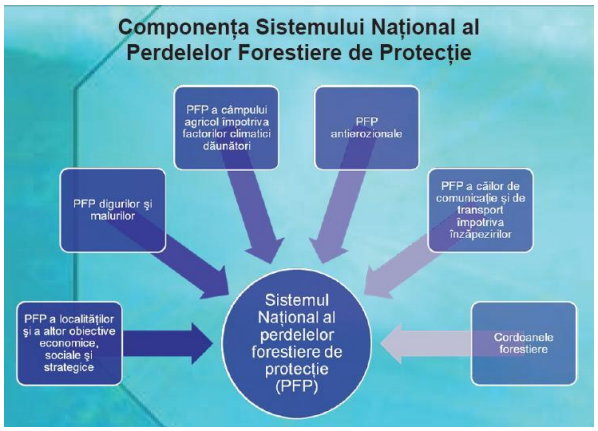

Fig.2.National System of Protection Forest Belts (Ianculescu Marian, 2010).

Regarding the renewable energy "Romania has the potential to be envied: good wind in Dobrogea, sun stronger than in Germany (for example), large biomass resources and many water courses.

Their capitalization will cause in ten years time, about 43.5% of gross domestic electricity consumption to be insured from "green" sources exceeding the target of 38% assumed in Brussels. "

Solving problems of global warming and the food crisis is suggested by Ianculescu Marian [9] by increasing the surfaces occupied by forest vegetation as a result of achieving the National System of Protection Forest Belts according to Law. 289/2002 promoted for the first time in the Romanian Parliament and beyond. (Fig. 2)

The action itself is part of the reconstruction of geosystems.

CONCLUSIONS

The main steps in the transition to a green economy can be considered as follows:

1.Development of institutional structures capable of setting out clear objectives to ensure the green economy;

2.Society as a whole to recognize the limits of the capacity of ecosystems.

To achieve this requires awareness of all market forces so that all people understand the need for a green economy.

Establishment of a green economy is a necessary and promising response to the global economic downturn, coupled with high climate changes increasingly alarming, the general degradation of the environment and drastically reducing resources, including drinking water.

However, the success of the transition from an economy based mainly on fossil fuels to a sustainable and ecologically economy will require a strong commitment and, ideally political will coordinate actions worldwide.

A special attention of specialists occupy sustainable development of rural areas, a delicate issue of great interest.

It aimed to create a balance of preservation and conservation of material and spiritual values of the countryside and its modernization trend.

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THE STATISTICAL INDICATORS OF POTATO PRODUCED IN ROMANIA

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Abstract

In this study we have analyzed and interpreted the main statistical indicators of potato produced in Romania. First of all, we start by presenting some information about potatoes: origin and appearance, their importance and necessity in the life of people and animals. Then on the basis of the specific statistical indicators, it was interpreted the evolution of the cultivated area, the percentage of the main counties in the cultivated area with potatoes, the average yield per hectare, as well as the import and export of potatoes in a given period. Each indicator was analyzed and corresponding remarks and conclusions have been drawn.

Key words**:** *average yield, cultivated area, export, import, potato*

INTRODUCTION

The potato origin was in the South American continent. Various species of wild tuber-bearing Solanuns are found in Central America. The potatoes introduction to Europe happened at two independant instances: around 1570 in Spain, and around 1590 in England. However, the large-scale crop cultivation began only in the beginning of the 19th century.

The potatoes of today in Europe are largely the result of the intensive breeding programs of the 19th century, but have benefitted greatly from the improvements in breeding techniques of the 20th century to improve traits like disease resistance, tolerance to environmental factors, etc[6].

In Romanian agriculture, potato has a relatively long tradition, first references being made in Transilvania in the XVIII Century.

With the passing of time the crop importance increased and potato is now considered the "second bread" of Romania [5].

The most widespread species in culture and the only important for temperate zones is Solanum tuberosum, of the family Solanaceae [2].

The uses of species are varied: food, in feeding stuffs and in all types of industries. As a novel food is used in the form of various cooked dishes, making it a valuable, tasty and digestible food. In feeding stuffs, potato is used in particular for feeding to pigs and cattle, it replaced a part of cereal, also it is exploited and of other species [1].

Taking into account the importance of potato in Romania, recent studies analyzed the potato market and its economic efficiency [3,4].

In this context, ongoing the actual results, the present study regards the evolution of potato cultivated area, production and trade in order to identify the main trends based on the statistical data in the period 2005-2010.

MATERIALS AND METHODS

For the purposes of this analysis we have used following indicators: the moving average, the mean square deviation, standard deviation, the coefficient of variation, confidence limits for a given risk, the yearly average increase, and statistical significance of these indicators. The used data have source: statistical yearbook of Romania.

The used formulas:

For the moving average = $\overline{X} = \frac{\sum xi}{n}$, where:

X = the average; Xi = media production values in a number of years (i);

n = number of years

For standard deviation, $\partial = \sqrt{\frac{\Sigma (x-\bar{X})^2}{(n-1)}}$ where:

∂ = standard deviation; $\bar{X}$ = media production values in a number of years

n = number of years

For the mean square deviation

, $\partial x = \sqrt{\frac{\Sigma (x-\bar{X})^2}{n(n-1)}}$ where:

∂x = mean square deviation; confidence limits for certain levels of risk = $\bar{x} \pm \partial \bar{x} * tp$, where tp= tabular values depending on the probability and number of observations (in the this case is number of years.

For confidence limits for certain levels of risk: $\bar{X}$+/-ðx*tp, where:

$\bar{X}$= average; mean square deviation; tp= tabular value for the transgression probability (risk).

For coefficient of variation = $C = \frac{\delta}{\bar{X}} x100$, where: C – coefficient of variation (it is expressed as a percentage). Coefficient of variation can be: between 0-10 % - small variation; between 10-20% -middle variation; over 20% - large variation.

RESULTS AND DISCUSSIONS

The main counties with the largest area cultivated with potatoes are Suceava, Covasna, Brasov, Maramures, Harghita si Bihor. All these 6 counties districts occupy 36.64% of the cultivated area as presented in Table 1 and Fig.1.

Table 1. The cultivated area with potatoes in the main counties of the country

No.	Main counties	Cultivated area(ha)	%
1	Suceava	27,697	9.82
2	Covasna	19,988	7.09
3	Brasov	15,244	5.40
4	Maramures	14,968	5.31
5	Harghita	14,367	5.09
6	Bihor	11,066	3.92
7	Total top 6 counties	103,330	36.64
8	Total country	282,047	100

Source: Calculations according to the Romanian Statistical Yearbook, 2011

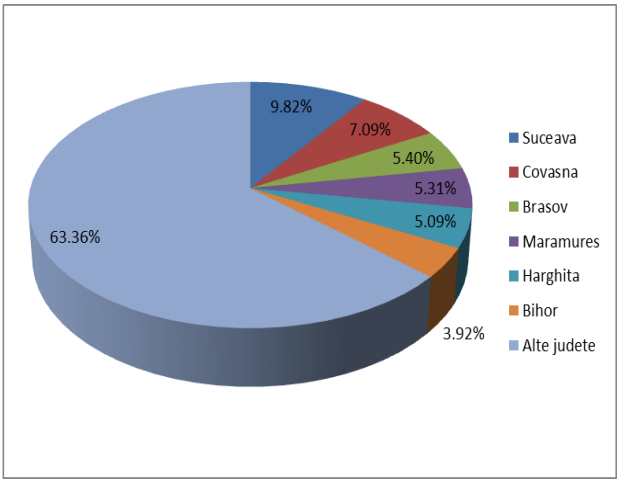

Fig. 1. Cultivated area with potatoes in the main counties of Romania

In the period 2005-2010, the cultivated area with potatoes registered a decreasing trend so that in in 2010 it was by 5.45% lower than 2005 (Tabel 2).

Table 2. Evolution of potato cultivated area in the period 2005-2010

No	Years	2005	2006	2007	2008	2009	2010
1	Cultivated area (thousands hectares)	284.9	278	268.1	255.3	255.2	241.3
2	Average rate %	-	97.58%	96.44 %	95.23 %	99.96%	94.55 %

Source: Calculations according to the Romanian Statistical Yearbook, time series[7][8]

Average yield per hectare obtained from potato cultivation had a positive evolution during the period 2005-2010. According to Table 3 it can be seen that average yield grew from a year to another, so that in 2011 it was by 24 % higher than in 2005.

Table 3. Average yield per hectare in 2005- 2010

	Years	**Average yield kg/ ha**	**Average rate 2005=100%**	**Annual rate %**
1	2005	13,078	100	-
2	2006	14,191	108.51	108.51
3	2007	13,663	104.47	96.28
4	2008	14,108	107.88	103.26
5	2009	15,498	118.50	109.85
6	2010	13,354	102.11	86.17
7	2011	16,554	126.58	123.96

Source: National Institute of Statistics[7][8]

Table 4. The calculation of indicators which characterize average production of potatoes for the period 2005-2011

No.	Average /year 2005-2011	Mean square deviation	Confidence limits p.90%, risk 10%		Standard Deviation of fouth	Coefficient of variation
			Lower limit	Upper limit		
1	14349.4	471.6	13433.1	15265.76	1247.8	8.70

Source: Own calculations[7][8]

As a result of calculating mean square deviation we will notice that in the confidence interval with a probability of 90% will be around yields average production which has values between 13,433.1 kg/ha and 15,265.76 kg/ha.

In accordance with coefficient of variation (8.7 %), it appears that yields per hectare in the period 2005-2011 did not show a high deviation from the average production, therefore the data were characterized by uniformity.

Romania's potato export during the period 2002-2011 has grown in average by 10.14 %, starting from Euro 1,037 in 2002 up to Euro 2,444 in the year 2011.

In the same period, 2002-2011, potato import has substantially increased from Euro thousand 2,700 in 2002, amounting to Euro thousand 23,670 in the year 2011, the rate of increase being 28.52 %.

Table 5. Analysis of potato export and import in the period 2002-2011

	2002	2006	2009	2010	2011	Average growth rate %
Export (Euro Thousands)	1,037	264	1,006	2,214	2,444	
%	-	2.64	1.84	2.2	1.1	10.14
Import (Euro Thousands)	2,700	16,240	9,763	11,944	23,670	-
%	-	1.77	0.73	1.31	1.84	28.52

Source: Own calculations[7][8]

The difference between the export and import is very high, reflecting that Romania is a net importing country of potatoes.

CONCLUSIONS

The area cultivated with potatoes decreased in Romania, but total production, average production, import and export increased. The increase of average production was possible due to the technological improvements in potato production.

The year 2010 was not a good year for potato because in this year cultivated area, average yield per hectare and potatoes export decreased and the potatoes import increased.

These was caused by the adverse climate conditions.

Taking into account the results obtained in production by the 6 counties, the main conclusion is that that in Romania, potato have a positive and increased economic efficiency in the hilly area.

In the period 2002-2011, potato exports increased but less than imports, which had a very high growth.

The import of potatoes increased due to annual consumption. Romanians consume annually, in average, 92,2 kg/inhabitant, ranking the 4th in the EU.

In this respect, Romania is overcome only by Portugal with 126,9 kg/inhabitant/year, Ireland with118,7 kg/inhabitant/year and United Kingdom with 112,4 kg/inhabitant/year [9].

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SUSTAINABLE DEVELOPMENT THROUGH ECO-ECONOMIC DEVELOPMENT

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Abstract

The issue of the relationship between humankind and the environment became scientific and economic concerns of the international community since the first UN Conference on the Human Environment (Stockholm, 1972) and resulted in the work of the World Commission on Environment and Development, established in 1985. Report of the Commission presented in 1987 by GH Brundtland, entitled "Our Common Future" provided the first universally accepted definition of sustainable development as "development that meets the needs of the present generation without compromising the opportunities of future generations to meet their own needs". Brundtland Report, 1987, was reaffirmed by the United Nations Conference on Environment and Development / Earth Summit held in Rio de Janeiro - Brazil, 1992 which established the principles of Agenda 21, which was intended to be a guide implementation of sustainable development for the 21st century, a development that was required to be applied at national, regional and local level. [1] In the context of developing new eco-economic system adopted a number of international conventions that establish detailed obligations of the States and strict implementation deadlines climate change, biodiversity conservation, protection of forests and wetlands, limiting the use of certain chemicals, access information on the state of the environment and other international legal space outlining the practical application of the principles of sustainable economic development in ecological conditions.

Key words**:** *eco-economy, economic growth, environmental protection, sustainable development,*

INTRODUCTION

The concept of eco-economic development is the premise that human civilization is a subsystem of the ecosphere, dependent on material and energy flows within its stability and capacity for self-adjustment. [2] Thus, we can define ***eco-economic development*** as *a new paradigm of development* created by the confluence of economic, social and environmental (ecological).

Eco-economy is the science that seeks to establish that level of socio - economic activities that biological systems can be effectively and efficiently used without destroying the conditions for their regeneration and sustainability. In this vision, sustainability of eco-economic systems depends on economy, society and environment.

At first glance, it might seem strange that combination terminology "*ecology*" and "*economy*" which, as we know, there are two part science, scientology classification of different research areas: first the "*Natural Sciences*" and the second in the "*Human Sciences*". [4] In reality, however, the etymologically, these sciences not only have a common root called in Greek "*oikos*" - home, dwelling, environment, but basically have a subject like - management house, with some shades particular. By analogy, "the economy is dealing with finance management and ecology and environmental management." [4]

Currently, in Romania and in the world there are many experts in economics, ecology,

biology, statistics, mathematics, sociology, politics etc. (Nicholas Georgescu - Roegen, Ilya Prigogine, Lester Russel Brown and many others), which promotes **sustainable integrated development concepts, bio-economic and eco-economic development,** accepting reality and serious problems of modern society, such as: [3]

- rarity and limited natural resources;
- limitations and restrictions rational economic development;
- pollution and alarming degradation of the environment;
- climate change and global warming;
- underdevelopment and food crisis;
- the economic, financial and social crisis.

Recent decades have brought to the attention of the public and decision makers a new dimension - **the environmental dimension of economic and social phenomena**. Long considered a stand-alone issue, *the environment* now have a general recognition, which only means that it supports the integration of a new look, a new dimension in every human activity to prevent situations of imbalance that led to dramatic effect with multiple economic and social costs. [7]

Currently addressing eco-economic phenomena, particularly the economic and social sustainability is the main premise, **eco-economy** being in direct relationship with both ecosystems and the biodiversity.

MATERIALS AND METHODS

In this paper includes the results of fundamental research based on the study of national and international bibliography. Thus, have been identified new concepts, were stated the original hypotheses and substantiated a number items were retrieved more often in scientific discourses on the new paradigm of sustainable development.

RESULTS AND DISCUSSIONS

Eco-economic development becomes an increasingly important role in the sustainable development process, where more often discussed the need to ensure fairness between generations, but also within them. In the figure below (*Fig. 1*) can be observed, for example, global interactions between social, economic and environmental (ambient) to ensure a eco-economic system bearable reasonably supported (sustainable) and viable. According to this paradigm eco-economic sustainable economy respects the "offer" of ecosystems is dependent upon all its resources, such as fisheries, forest resources, pastures and meadows, arable land, etc.. As long as harvests do not exceed sustainable supply can be supported acceptance of the limits of natural systems. [2]

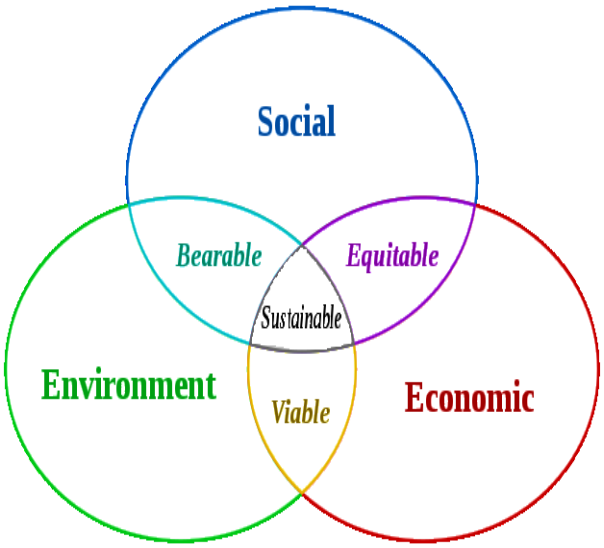

Fig. 1. Diagram of eco-economy paradigm

In these circumstances, the new fundamental concept **eco-economy** believes that the modern economy must be based on the fundamental rules of natural and artificial ecosystems (anthropogenic) to save the planet and its endangered civilizations. [2]

Nicholas Georgescu - Roegen, in his works, ***distinguish between growth and development***, two terms so often confused and sometimes used in the theory and practice of economic thought. Taking the ideas of Joseph A. Schumpeter, Nicholas Georgescu - Roegen states: "*growth means to produce more development to produce otherwise*". [5]

Dominated by the idea of perpetual accumulation, mankind has been for centuries and are still in a continuous pursuit for this "more" without understanding the truth that,

in fact, its natural purpose is to "be" in a qualitative context - moral and material - higher. Essentially, the originality of his thinking N. Georgescu - Roegen consists of an evolutionary vision of economic development of the human species associated laws of nature and especially Law Entropy (second law of thermodynamics) which he calls "the most economical of laws of physics". [5]

Humanity depends essentially on the economy, but thereby generating a significant impact even on the substrate on which it was inserted, the substrate on which life itself. Responsible treatment of this delicate coupling is therefore something of vital importance and is based on the application of economic theories that do ignore its existence, can be evaluated so that the balance between human and nature is not harmed irreparably.

Eco-economy and bio-economy is a multidisciplinary field of academic research *addressing interdependence and co-evolution of human economy and natural ecosystems over time and space.*

In perhaps surprisingly, the first in the world biologists who tried and failed to make a logical bridge between ecology and economy was known Romanian biologist (ecological, ichthyologist, museologist) *Grigore Antipa* (1867 - 1944), one of the first students of E. Haeckel, who urged specialists to address all issues regarding the nature of living systems through the prism of economics. Also, G. Antipa was the first in the world that addressed ecosystem biologists, even though this term does not exist. This enables us to say with certainty that Romanian biologist founded *ecological and economic productivity conception of natural ecosystems.*

Noted Romanian economist Acad. N. N. Constantinescu appreciates Grigore Antipa, saying, "*if he was an economist environmentalist, certainly was an environmentalist economist* ". [5]

As can be seen from the above, the vast majority of economists addressing economic activity and bio-ecological vision, they are asking the same basic questions about the real importance of putting in the forefront of cost - benefit analysis.

Based on analysis of different areas of science (economics, ecology, biology etc.), bio-economy and eco-economy studying complex economic relations between economy and environment, focusing on issues such as: energy and material flows, degree environment, sustainable economic development etc. In this vision, **sustainability depends on ecoe-conomic** systems: economy, society and environment (*Fig. 2*). [2]

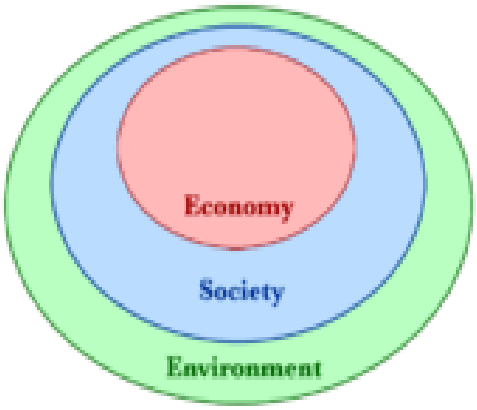

Fig. 2. Pillars of sustainability

As you can see from the picture above, the two circles "economy" and "society" are included in the great circle of the environment. In other words, the economy and society are included in the planetary ecological system. This view is useful to correct the misconception, which are sometimes drawn diagrams of sustainable development, social and economic systems which are independent of the environment.

CONCLUSIONS

All phenomena of negative environmental impacts, but especially negative effects of pollution on soil, water, air, biodiversity and landscape, determined attitude change scientists and decision makers regarding the development strategy. Thus, now is discussed about a **new philosophy of sustainable development.** Humanity depends essentially on the economy, but thereby generating a significant impact even on the substrate on

which it was inserted, the substrate on which life itself. Responsible treatment of this delicate coupling is therefore something of vital importance and is based on the application of economic theories that do ignore its existence, can be evaluated so that the balance between human and nature is not harmed irreparably. [6]

The vast majority of economists addressing rural economic activity in ecological and eco-economic vision, they are asking the same basic questions about the real importance of putting in the foreground cost - benefit analysis. Based on analysis of different areas of science (economics, ecology, biology etc.) **eco-economic sciences** studying complex relations economy - environment, focusing on issues such as energy and material flows, degree environment, sustainable economic development etc.

The environment currently considered a political priority internationally, can not be excluded from enrollment concerns coordinates Romanian rural economy to market economy. ***Eco-economic development*** involves externalities borne by the environment, which makes the account even long-term viability of the process itself, the interaction environment - saving the character of feed-back. Inserting environmental policy instruments is not only necessary but also desirable, in this period the world economy navigates looking for a balance. [7]

In conclusion, **integrated economic development** *means ensuring progress simultaneously on four fronts: economic, social, environmental and technological*. In this context, ***the approach of eco -economic sustainable development*** is particularly important for achieving sustainable development. This results in the need to overlap ecological economy, namely the need to integrate environmental requirements in assessing economic and social activities. This is necessary given that the market signals they transmit are often invalid, do not reflect the environmental damage, costs that will be incurred by the company in the long term.

Genius work of these thinkers, such as Nicholas Georgescu - Roegen, Ilya Prigogine, Lester Russell Brown and others, is and will remain the property of humanity that present and future generations have moral and professional duty to give value and meaning wanted, namely: **sustainable economic development for the benefit and welfare of the entire community.**

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ROMANIAN AGRICULTURAL POLICY AND SUSTAINABLE DEVELOPMENT OF ANIMAL PRODUCTION

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Abstract

The rapid evolution of civilisation within the last two hundred years has involved the replacement of extensive, pastoral livestock systems for intensive production methods. The dangers implicit in this rapid evolution are discussed by Forrester (1971),in the Meadows report (1972) and latterly the necessity for "sustainable development" was flagged by the Brudtland Report (1987). The last agrarian reform in Romania increased the weight of small farms and led to non sustainable agriculture. In such conditions we are obliged to follow a twin-track strategy: (1)livestock systems with high productivity potentials; (2)traditional pastoral systems and organic agriculture, on marginal lands, which allow the utilisation of extensive grazing lands, the conservation of environment, genetic resources, landscape, the minimisation of the use of non-renewable resources and the production of "natural foods".

Key words: *agricultural policy, agricultural reforms, developmental mechanism, organic agriculture, premises of development, sustainable intensive systems, traditional pastoral systems*

INTRODUCTION

After five agricultural reforms, of which the only the one of 1864 had a clear economic objective: family farm of 5 ha and implicit an etic-social objective, and the second reform (1950-1962) whose economic reason (farms flexible to the new technological inputs), was shaded by its brutality, the lack of equal achievement and an unsufficient technological support, **animal production, Romania's agriculture is today unviable and non durable,** characterized as follows:

-animal livestock and production has dramatically decreased during the last decades. **We consume more than we produce** without being sure that malnutrition and low nutrition could be avoided;

-from an economic and qualitative point of view, what is produced is not competitive under the actual conditions and international trade agreements (EU, CEFTA, globalization etc.);

-it is not assured a secure food supply at reasonable prices for consumers;

- for the agricultural population with a share of 35% in the country population can not be assures a corresponding living standard compared to the population working in other fields of activity;

- the EU Common Agricultural Policy of a large intervention in the farm modernization is not enough understood;

-production and development of technological inputs is a critical one and the lack of vertical integration can not protect farms against the upstream and downstream pressure.

The main cause of the actual situation is the agricultural reform promoted in 1991. It facilitated the creation of very small farms which are not able to buy and use new technological inputs. As the economists from the period between the two world wars remarked, the tradition to divide land in equal parts for all the descendants has led to an extreme property fragmentation, annulling the effect of all the other previous reforms. Taking into consideration the American standard ("an agriculturist is any person owning minimum 4 ha land and getting a minimum $4,883 income, of which $ 3,605 from farming), in Romania there are no agriculturists. It is like in that French article "Une France sans paysans" (Gervais et al., 1965).

The CAP objective is the farm modernization by increasing farm dimension, technical endowment and receptivity to the new technological inputs.
The ethic objectives of the reform in Romania are annulated by the lack of economic efficiency.
Therefore, it is needed to set up a new **strategy, a national policy for agriculture modernization, neutral in relation to the actual political framework and whose objectives to be carried out consequently by all the governments who will succeed.**

MATERIALS AND METHODS

The paper presents the author opinions on the situation of animal production and the need of its development in the context of the actual EU agricultural policy.
A critical approach is carried out using the analysis and synthesis methods and logical deduction method as well emphasizing on the following aspects: premises of the new agricultural policy, modern mechanism of agricultural production development and durable development of animal production.

RESULTS AND DISCUSSIONS

Premises of an agricultural policy

The policy for the development of animal production is based on three premises as follows:
1.At least in the 1st half of the 21st century, **it is imposed the efficient economic maximization of food production, saving of the nonrenewable energy resources and nature preservation**. This is imposed by actual malnutrition and low nutrition of the population and the danger **to decrease food production per inhabitant** in the 21st century, one of the 5 dangers mentioned by Forrester (1971) and Meadows (1972) and who developed the concept of **sustainable development** (Brundtland, 1987). Ignoring Meadows Report, it is a continuous tendency to **depreciate the concept of sustainable development** reducing it to environment protection, "natural capital" (Kalow, 2000). Without denying the need to preserve ecological principles, the economic policy has to see clearly the consequences of this principle and analyze the solutions.
2.Animal husbandry, component of agriculture, is a **strategic resource.** National security **includes the long-run maintenance of its sustainability** (Battie şi Healy, 1980).
3.Rural life has a major role in assuring the **social sustainability and national persistence**. Despite that, for assuring a normal living standard, the share of active population in agriculture has to decrease below 10% (from 35% nowadays in Romania), and of the one of rural population dealing with agriculture below 25%, it is necessary **to assure a long-term rural development by** encouraging investments in rural space both in agriculture and industry. Animal production play an important role in this direction.

The modern mechanism of the development of agricultural production

The mechanism of the development of intensive agriculture (The High-Payoff Output Model Fig. 2 – adapted after Ruttan, 1980) includes four factors:
1.Capacity of institutions in the field of scientific research and technology to continuously produce scientific knowledge and technologies (biologic, chemical, mechanical) proper to market change, input-output ratio (energy etc.). In case of the correct selection of the scientists, the investments made in science proved to be the most efficient ones (Ruttan, 1980).
2.Capacity of upstream industry (vegetal production, combined fodder, genetic resource, machinery etc.) to **produce, develop and commercialize the new technological inputs**.
3.Farm capacity to absorb the new technological inputs and use them effectively.
4.Capacity of downstream industry to adapt its tehnologies to market change and establish benefits which do not affect farm viability (vertical integration).
The input-output relation is different in various countries and in a continuous

dynamics, so that the mechanism should be adapted to it and the system of resource allocation to support it.

A double itinerary for the sustainable development of animal husbandry

The fast evolution of civilization in the last 200 years and especially in the last 50 years has led to **a rapid development of intensive agriculture on the back of the extensive one**. Despite that it was justified by the need to nourish the world population growth which is ongoing, such an evolution **has raised serious problems regarding nature preservation, non-renewable energy sources and the use of marginal resources**. All these aspects oblige us to accept a double itinerary of development for animal husbandry as follows:

-intensive sustainable systems with a high production potential which have to allow a correct food supply for long –term to the country and planet population, **economically and ecologically viable and also competitive systems**;

-traditional production systems, especially pastoral systems, able to allow the use of **marginal resources, nature preservation** (genetical resources, pastures, landscape, environment) and to also satisfy the **requirements, on a large-scale subjective of the amateurs of organic food**.

Sustainable intensive animal husbandry

Appeared under **the incentive of the green revolution** (1940-1973) and of **the strategic competition** between military blocks, animal production and vegetal industry, **animal production has increased 3 times** pee head and hectare especially in the NATO countries. The mechanism of this development is mentioned in the EU documents. The major EUCAP provided into Art.39 of Rome Treatise were:

-to increase of agricultural productivity by encouraging **holdings modernization**;

-to guarantee **a equal living standard to agricultural population** similar to other sectors of activity;

-to guarantee **a safe food supply at reasonable prices for consumers.**

These objectives were fulfilled by a large intervention (1/2 of the EU budget, subsidies, guaranteed prices etc.) in the market economy. **Farm modernization** remains a major EU objective after CAP Reform(Mc Shary, 1992, Agenda 2000).

In the period 1965-1989, Romania achieved important progresses in the file dof animal husbandry modernization. Despite that pig industrial holdings assured only **60% of Romania's pork production**, and the poultry complexes only **44.7% of poultry meat production and 42% of egg production**, the difference coming from the private sector, Romania came on the first positions among the top **10 countries in the world**. More than that, according to Dr. M. Bichard, in the field of pig production Romania was a pioneer in modernizing pig farms.

The big problems of the Romanian poultry and pig farms were: high fodder **consumption**/product unit, **carcass low quality** etc), and were generated by the upstream farm inputs (fodder assortment, quality of genetic material etc.). **These inputs, especially fodder price and sort have deeply contributed to the fail of holdings and brake their recover.**. The upstream inputs, besides a few technological problems have practically obstructed the modernization of **dairy farms** (60% of milk production was supplied by subzitence family farms in 1985).

Romania's integration in the EU CAP of farm modernization supposes besides the modernization of the family farms in order to increase their size and endowment, **the restart of the industrial poultry and pig holdings** (Drăgănescu, 1992) and **their modernization** in the context of sustainability and competitiveness. A similar way has to be adopted for dairy farms, even thou the problem is more complicated from a technical and economic point of view. **The objections brought to industrial production are not essential**. Paraphrasing Harlem (1980), who sustained monoculture, "industrial animal production is specific for modern agriculture and we have to e accustomed with it; in fact we could dye without it. There are too many

people on the earth to go back to the more complex agro-systems from the old times.

Extensive systems of animal production

In Romania, "**a Carpathian sheepfold for a wolf pack**", as Iorga said, traditional systems, especially the pastoral ones with low input-output animal production have a long tradition and contributed substantially to the **persistence and unity of the Romanian people** (Drăgănescu 2001). They survived in difficult conditions. In 985, after 25 years of pressure against them, in the family subzistence households of the peasants working in co-operatives and also non working in co-operatives, there were **99,1% of goat livestock, 85.1% of bee hives, 60% horses, 50.5% sheep, 40% cattle and poultry; there were able to produce 60% of milk production, 48.8% of meat production and 52.8% of wool**. These systems had the mission to:

-utilize the marginal resources without using non-renewable resources;

-assure landscape preservation (pasture ecosystems);

-assure animal genetic resource conservation;

-contribute to the stabilization and development of rural settlements;

-preserve history.

Low input-output production systems can be classified into three categories:

a)traditional pastoral systems: transhumance, moving between mountain village and meadow or free grazing in the Danube Delta;

b)subzitence systems– animals (dairy cows, goats, pigs, sheep, poultry) raised next to the house for covering the family needs;

c)**organic agriculture** ("ecological", "biological", "alternative" etc.).

Pastoral systems are of the highest interest from all the points of view. Practiced for long distances from the Bohemia Carpathians to Istria and to the Caucasian and Ural Mountains, transhumance is the most efficient economic system which allowed …"**to conquer territories with sheep**" (Teaci D., 2000), territory which could not be preserved by political relations. Nowadays, there is an "**European transhumance map"** (1997), non considered in Romania and which recommends its preservation.

The subsistence systems are a short or middle run system in close relationship with the living standard in the rural area. For long run, they have to be transformed into "hobby" or "part-time" systems.

Organic agriculture is too much taken into consideration in Romania. This is generated by the fact that **it is not expected an increase of animal products on the EU market**, being considered just an increase of demand for higher quality products. The high production expenditures in these farms is expected to double the pork retail price that a few consumers would like to pay (In United Kingdom, the share of food costs is only 11 %), while most of consumers will remain faithful to intensive agriculture because they would accept a price by maximum 20-30% higher (M. Bichard, 2001). The paradigm of this situation is that "**producing less, spending more, and selling more expensive, the organic farmers will solve their own business, but not national and world food requirements**" (Klatzman, 1985). **In this context, agricultural policy must not encourage organic agriculture except on the marginal land and against intensive and pastoral agriculture**.

In case of Romania, it is expected as fodder production to increase, fodder price to decline and vegetal production to be modernized and have enough capital to develop the intensive animal production, which will become competitive in the EU market. The lower labour price, avoiding the legislation regarding "animal welfare", avoiding legislation regarding environment preservation and introduction of new technologies which will determine a lower production cost, will be of much help for the development of intensive animal production.

CONCLUSIONS

In order to develop sustainable animal husbandry in Romania, a new agricultural policy is needed and should be oriented in four directions:

-Development of traditional pastoral system in the mountain areas;
-Development of subzistence systems which should be transformed into "hobby" and "part-time" agricultural systems in family farms;
-Development of organic agriculture on the marginal land;
-Development of intensive animal production by using new technologies in order to assure food at national level and also for the EU market.

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SOME PROBLEMS REGARDING THE AGRICULTURAL AND SUSTAINABLE DEVELOPMENT IN ROMANIA

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Abstract

The old rural civilization which assured a long and miraculous surviving of the Romanian people, it is at present in a critical breaking up moment. Production and rural living standard have become lacked of competitiveness, traditions and customs are left and people move to cities. Production looks to be unefficient and not sustainable from an ethnical and social point of view. Under the pressure of this situation, and also of the international concerns (ONU 1972, FAOSARD, UE) and European concerns (LEADER 199, EU RDP 2007-2013), sustainable development has become the core of the activity of Romanian scientists and authorities (SNDD 2013-2020-2030, PNDR 2007-2013). Taking into consideration the previous research results and programmes, the present study approaches the need to pass to real actions based on the analysis of the thresholds of the affected space, some aspects of the agricultural and rural sustainable development, regarding: farm modernization as an economical and social imperative and mention some aspects of the rural sustainable development including also the preservation of cultural, natural and rural heritage.

Key words**:** *agro-biodiversity and biodiversity, national heritage, rural development, sustainable farm modernization*

INTRODUCTION

"Agriculture is a strategic resource; national security imposes its sustainable development for long-term" as said S.Batie, R. Healy, 1980.

Agro-pastoral life from the South-Eastern Europe is an **important informative item for understanding the puzzle and historical miracle which is the Romanian people.**

The old population speaking Latin in Dacia and the ex Roman Empire from East was saved in the 3rd and 7th centuries from "the tongs" of the new immigrants and new rulers from Bizantium (in the year 641, the official language moved from Latin to Greek).

Being withdrawn in marginal places, especially in the mountains, the old population lived a rural modest pastoral agro-forest life (Matley 1970, Botzan 1996, Drăgănescu 1994-2010, a.s.o.). The Dacian-Roman urbanism being lost in the « storm » of foreign migrations, this rural culture saved the existence of the Romanian people, including the ethnic one. The penetration of the paradigm of the new European civilization favorized the creation of a Romanian state, and also imposed severe social and economic changes (Chirot, 2004).

These changes were focused and still are on the development of the Romanian people living standard at a competitive European level, on the improvement of the old agro-rural life endowment, and at the same time they affected its positive aspects. We are still living in this era of changes.

Due to this aspect, the Romanian people was obliged to move to the marginal areas and live a rural agro-forest-pastoral life; the spread of sheep breeds reflects the history of their « pastoral country ». The new populations, who came on this territory, assimilated the local population, creating a commun substrat even though the language, the strat and adstart were different. They have to be more cooperant accepting and not denying the substrat, the Romanians, becoming a factor of union (Draganescu 2007).

Looking for a correct and competitive solution of social and economic development under a political complex background, five

reforms of agriculture were adopted in Romania of the 19th and 20th centuries.

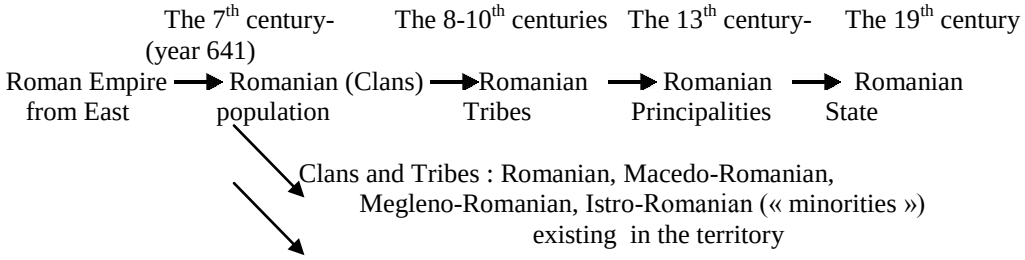

Fig. 1. Formation and persistance of the Romanian people in the historical South-Eastern European context of the years 641-1860.

MATERIALS AND METHODS

The paper is based on a deep documentation by studying a large variety of important publications belonging to well known personalities along the time who had the courage to present their opinions in order to support the development of agriculture and rural areas on the right way.
Analysis and synthesis, logical deduction and critical approach are the main instruments used by author who tried to present in his manner and logical thinking his own opinions on sustainable development of agriculture and rural areas in Romania.

RESULTS AND DISCUSSIONS

The reform of the '50s, a "forced and terorist co-operativization", motivated by the modernization of agricultural production in order to make it competitive with the EU CAP, has been a historical turn in the rural life. In the years 1990, ***based on ethic and political reasons***, the technical and economical reasons were underestimated and determined to come back to the non competitive subzistence agriculture.
In the prewar period, it was mentioned "an agrarian overpopulation", a deficit of endowment, the need of producers joining (Ionescu-Sisesti, 1930); a prosperous agricultural household had to own a plot of minimum 10-20 ha (International Congress of Agriculture, Hague, 1937). St. Voicu (1936) afirmed that the agricultural reform of 1918 was applied so that the peasant not to be able to use the land because his land was devided into too many plots (Bădină, 1965). In fact, Garoflid (1925), the ex Minister and President of the Agricultural Academy remarked that the reform of 1918, also issued and applied to counteract the threatening of the Russian Revolution, crumbled the agricultural holdings too much and the « fusion » of the small households and a free economic policy for improving agricultural production was needed. Ionescu-Şişeşti (1931) underlined that the association of the peasant households was the only solution to develop agriculture and many specialists sustained the idea of industrialization and urban development for assuring jobs and raising the peasants' living standard.[1]
Using his monographic research method, for studying the reality of the social rural life, Gusti and his School elaborated the « Sociological Atlas of Romania » and started **the 1st systematic process of rural development at world scale** (Plan of Cultural Action in Villages, 1932, Students' Teams in Villages, 1934, Law of Social Service, 1938).
In the 2nd half of the 20th century, after the partial abolition of the "laissez faire", the classic principle of the market economy, as mentioned by the 1st Report of Rome Club (1972, UNCED 1992), it existed the danger of

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an unsufficient world food production and the actual civilization could become non sustainable. This problem also regards the level of agricultural production and rural life in Romania. ***Traditions, customs, aspirations, which assured the ethic and ethnic cohesion of the old villages have been abandoned. Agricultural production has become lacked of competitiveness in the European country. Villages lost their old cohesion and ethic status (Stahl) and people run to cities as they have no jobs***.

Globalization of the economy and technological revolution including the new communication and information techologies have given a world character to agriculture problem, which **imposed *world programmes and strategies for increasing food production and preserve natural resources*. In this respect, Unites Nations Organization established FAO (1948) and initiated SARD Programme (Sustainable Agriculture and Rurala Development -DARD-1998). The EU and Romania at present added Common Agricultural Policy (CAP-1962), aiming the development of food production, a Programme for Sustainable Rural Development for the period 2007-2013. According to National Strategy for Sustainable Development,** Romania has to fulfill its engagements assumed according to the Treatise of adhesion and the Romanian economy has to reach the average EU-27 development level from the year 2007 by the end of the year 2020. In 2030, the national economy has to fit with the EU average development in that year.

Agriculture and rural development are considered sustainable only if they are viable from an economic and ecological point of view, correct from social point of view, corresponding from a cultural and human point of view and based on a scientific approach. **The new problem which arised was: Is Romania's agriculture and rural life (SARD) sustainable and competitive in Europe and at world level?**

***The scientists have to answer this question and offer solutions for attaining this major purpose*.**

The problem of sustainable agri-zoo-forest development belongs to the state authorities and scientists.**This paper tries to bring a modest contribution to the clarification of the actual objectives and strategy.**

I.THE REAL SITUATION OF AGRICULTURE AND RURAL LIFE-AN ARGUMENT FOR ITS DEVELOPMENT IN ROMANIA?

According to a statistical Report in 2007, about **2/3, 64 % of the 866,700 Romanian "farms" larger than 1.3 ha produced more than for the own consumption; only 35% produced for direct delivery in the market.Thus, these farms were able to assure food for only 10 million persons. If all the** 866,000 farms would produce for sale, using all their agricultural land, the resulted food would be sufficient to nourish **30 million people.** The actual production system is an extensive one with low inputs. By the implementation of modern production systems, production could increase by 30 %, assuring food for other **20 million people.**

Among the negative effects of transition we have to mention : dezindustrialization, dezurbanization, destruction of agricultural structures, declin of purchasing power, life quality and health and education public services, lower natality and life expectancy, a weaker social and national solidarity ". (I. Iliescu 2003-2009)

Animal husbandry plays an essential role in the sustainable development of agriculture and rural space (SARD), due to its unique importance in assuring food safety, farmers income, resource and biodiversity preservation.

I.2.PRODUCTION MODERNIZATION IMPERATIVE

Five arguments support **a clear, sustainable, correct and scientific agro-rural policy** as follows :

-Agriculture, food safety, is not only a military strategical problem, but also a matter of surviving for any state. **It is a potential « food gun » and an important economic resource (**S. Batie,1980**).** In addition, it is **the essential component of rural life.**

Traditional agriculture and the concentration of settlements on the peaks and transhumance have been social peculiarities assuring the physical and ethnic life of the Romanians **(Botzan, 1996).**

-Poverty, hungry, inequity are sources of political and social instability at national and world level. For this reason, FAO was created in 1948, SARD Programme in 1998 and some ONGs started the green revolution (Rockefeler-în Mexic) and CAP were founded in the EU. The objectives of the EU CAP and now of Romania too (Art. 33 of EU Treatise, ex Art. 39) are: "a higher productivity in agriculture, guarantee for corresponding living conditions for farmers, market stability, food supply and reasonable prices for consumers**.**

Some recent articles (Holt-Gimenez 2009) are entitled "The Food War" and "Food Rebellion ".

-The city overdevelopment is not sustainable from an economic point of view. Rural life is ecologically much more corresponding biologically to human being. The dangerous migration of the rural people to cities is produced by poverty, lack of jobs, and disconfort. In the EU, it is a dangeruous phenomenon, and the decline of rural population will affect agriculture, perservation of natural environment and landscape, traditions and national and European heritage.

-The danger of the fall of the actual civilization also imposed a policy tdestined to preserv resources, agro-eco systems, and agro-rural life is extremely useful in this respect.

-The technological and organizational decisions are not scientifically fundamented, as it should be, based on mathematical calculus, more often they are drawn on subjectve interests. Even though, the principle of the Strategy from Lisbon was not completely respected (2000-2010) in order to transform the EU into the most competitive and dynamic economy based on science, it is still available. Investments in research assure 10-15 % profit annually, 2 % agricultural gain, 1.8 % increased production and 6 % higher labor productivity, depending on investment rate and technology use degree (Ruttan, 1980, Drăgănescu 1999).

Gusti ***(1936) proposed as any specialist: doctor, agronomist, veterinarian etc to offer services in villages in order to contribute to the improvement of rural life. This proposal was accepted by Law of Social Service.***

Romanian organizations and specialists are not enough active and present in the international organizations, they do not contribute too much to the country prestige and recognition.

România is not a member of International Federation of Agricultural Producers (**IFAP), (**Republic of Moldova does), and also it is not a member of World Committee of Agricultural Co-operatives.

I.3.TYPES OF AGRICULTURAL AREAS.

In Romania, there are about 22 –23 types of agro-ecosystems (Vădineanu, 1992, Teaci 1978, 2000) and each one supposes a different agricultural system. In the European legislation, these agro-ecosystems are classified into two categories:

(a)Favorable areas for agriculture -FA (climate, soil, opportunities for mechanization etc.)

(b) Less favorable areas for agriculture -- LFA (EC 1257/1999).

II. OBJECTIVES AND STRATEGIES FOR AGRICULTURE MODERNIZATION

Agricultural Policy for sustainable and competitive development is in a critical moment at present because it has to decide **"to fail" or "to win"**. The actual situation is under a bomb with a delayed explosion by 50 years as Jared Diamond affirmed in 1999 and 2006. In Romania, in order to help Agricultural Policy to win it was issued Law 204 destined to protect and encourage intensive agriculture. Many Romanian scientists (Otiman, Bold, Tofan, Hera, Teaci, Stanciu, Rauta, Avarvarei etc) paid a special attention to the problem of sustainable agro-rural development. The detailed information provided by some their papers (Otiman "Rural Development in Romania (1997), Rauta, Carstea « Items of Sustainable Development»

a.s.o.) could not be presented in this papers but deserve to be considered by readears. Taking into account that **Romania is among the top 10 countries with high technologies in the world in special fields of agriculture (poultry farming, pig farming, beekeeping** ș.a.), in this paper, the comments regards a few problems of sustainable agriculture modernization.

II.1.AGRICULTURAL SYSTEMS. In România, as in many other countries, there is a large variety of geographical, climate, socio-economica zones. This diversity imposes **a diversity of systems, each one destined to maximize agricultural production in each agro-ecosystemic area.**

In order to achieve a sustainable and competitive agricultural production, Romania will be obliged to develop **two groups of systems adapted to the favorable and less favorable areas** in the 21st century (Draganescu 1992, 2003) as follows :

a.Revitalization of the commercial intensive farms *in the favorable area (FA) by inovations*;

b.Revitalization, preservation and sustainable development of *:* (1) *semi-intensive agricultural systems (* « mountain areas and especially pastoral systems ») **in the mountain and marginal areas *(LFA)***, and **(2)*organic (« ecological ») production systems* in small commercial farms with special production (part-time or hobby subzistence farms) in the special marginal areas** *(LFA).* Only the considerartion of these two groups of systems could assure a balance between food demand and agro, biodiversity, resource and environment conservation

For the moment, the 1st group of systems is more important because its aplication imposed production security and competitivity.

But, it is needed to have clear financial policies to encourage the evolution in the two directions, an aspect which compiles with the EU provisions.

II. 2. INTENSIVE AGRICULTURE IN THE FAVORABLE AREAS (FA) Also called **integrated agriculture**, it is characterized by the rationale use of input, knowledge and techniques required to achieved a maximum agro-eco-system benefit. The efficiency of the agro-production system depends in a large scale on: a) Farmer training level, b) Farm size, c) Development of complementary or alternative production to agriculture, d) Consideration of restrains imposed by eco-systems; e) Vertical administrative or cooperative integration, f)Territory systematization and arable land preservation, g) Efficiency of research organizations. We are going to approach only the first two problems.

II.2.1.Farmers qualification. In any farm or intensive agricultural commercial enterprise, farmers have to be graduated of an agricultural college. In Germany and Denmark none could own or inherit a farm from a juridical point of view, without having a green certificate attesting his/her knowledge and skills to manage a farm. This means to be a graduate of a special agricultural school or college and also clarify the notion of farm as an enterprise producing goods competely different from a subzistence or hobby agricultural property.

In the USA, a plant cultivator or animal breeder is considered a farmer (1978) only if he/she would sell products whose value to exceed USD 4,883.

To admit as a farm administrator only a person who graduated an agricultural school is possibile only if : (a) that farm is able to produce an income suitable to farmer's qualification at least over the average income, which is possible only in a farm enough large (in 1994 we estimated 12 dairy cows); (b) Legislation regarding inheritance and buying of a farm will be changed according to the rules in force in the EU.

Law **166/10.04.2003, Art. 4 provides that commercial agricultural holdings have to be managed by a qualified person in the field, but the family farms are accepted as being managed by their qualified owners. But, we consider that this « law » has remained just a simple declaration, it is still incomplete, not having a clear objective and strategy.**

II.2.2.Farm size. There are optimum, minimum and maximum dimensions for any

production (cereals, dairy cows, sows, etc), farm types (intensive, extensive, part-time etc) and ecosystems (favorable or not favorable for agriculture). This farm size should be scientifically calculated and supported by the state agricultural policy.

Farm size was one of the first problems considered at the moment when EU **started farm modernization.** Mansholt Plan (1962) estimated a dramatic growth of farm size, not accepted by farmers, even though it was very much mediatized. In the French book entitled **« A France without peasants »(1965),** there were mentioned three types of farms as follows: (1) **modern farms** (large farms, farmers being agronomists), (2) **modernizable farms** (possible to be modernized by state) and (3) **nonmodernizable farms** (which ahd to be assimilated by the first two types). In Tabel 1 and 2, it is presented the evolution of farm size in France and USA.

Sykes (1963), citated by Drăgănescu (1967, 1992, 1995), estimated that a commercial family farm should have **100 milking cows or 20, 000 laying hens or 40,000 chicken broilers or 800 young steers for fattening or 400 ha cereals.** The EU CAP thought to such a farm size in 1960. **Sykes** afirmed that the majority of farmers should join in co-operatives or in vertical integrated contracts or farmers could be only part-time farmers in alerger enterprise dealing with other fields of activity. We have to mention that in Norway, all the milk is produced, processed and commercialized by farmers co-operatives.

Table 1. Farm size evolution in France
(Andre Neveau, 1993, Draganescu, 2000)

Farm type	Average size Ha		% agricultural land		No.of farms (thousands)	
	1988	2000	1988	2000	1988	2000
Enterprises	100*	120*	35.1	52.6	100	120
Family farms	27	45	51.6	32.9	540	200
-Special farms**	10	10	2.8	3.6	80	100
-Replacing farms***	10	10.5	15	10.9	300	200

*equivalent with 40 cows or 80 sows;
**(viticultural, armagniac, fat liver etc)
***additional income(part-time) or before retire

Table 2. Evolution of average farm size, number of workers per farm and productivity in the USA
(Otto C, 1980, Draganescu 2005)

Year	Farm size (ha)	Workers per farm (No)	Production value per worker (USD)
1940	70	1.8	3,300
1950	87.4	1.84	9,400
1960	120	1.78	21,100
1970	153.7	1.53	96,562
1979	183	1.69	172,637

In 1976, 17% farms produced 90% of agricultural production value.

Romania, whose poultry and pig farming and beekeeping were situated among the top ten countries in the world, has become a net importing country from a net exporting one. From a scientifical and managerial point of view, the question arising is : Is it possible to survive in the future European and world economy ? The answer is linked to farm size and type, of their degree to adapt to eco-systems and new technologies.

Farm size and type was analized by many scientists (Otiman 1994-2009, Teaci 2000, Tofan 2005, Bold, Buciuman, Draghici 2003, Alecu a.s.o.) drawing prudent conclusions and having the tendency to support the family farms.

In the years 1992, 1995, 2001, we sustained, without any succes, the durable development and conservation at least of the ex intensive state enterprises in the field of animal husbandry.

The minimum size for commercial farms established in Romania by Law 166/10.04.2003, Art 5, using Otiman proposal (1997, p.330), was the following one: **cereals, technical cropse 110 ha (in the plain areas)-50 ha (in broken areas); orchards, vineyards, vegetable culture 5-15 ha, 15 dairy cows, 300 sheep, 100 pigs, 2,000 laying hens, 5,000 broilers etc.** Taking into account the statistical data, most of farms are family subzistence or small commercial farms (less than 50 % sold production). This Law does not affect them and its effect is not clear at all.

In1995 **Heinz Muth,** a graduate of the Faculty of Animal Science in Timisoara,

owner of an agricultural consultancy company in Germany, recommended without being asked, the increase of efficiency in the Romanian agriculture by farm size growth as presented in Table 3 for the period 1995-2005.

One of the most difficult problems of farm size in Romania was land division by inheritance. The agrarian reform from 1864 established that the optimum farm size for that time was 5 ha. În 1921, Garoflid proposed 20 ha as an optimum farm size. After 2-3 generations, the farm of 5 ha proposed by Ionescu de la Brad, declined to less than 1 ha, and remaind at that level till today. It is obvious that a "farm whose size is less than 1.5 ha and divided into numerous plots is not sustainable at all from a technological point of view and unefficient for its owner. This is the reason why in Germany only the first son inherits the farm and if he/she has an attested agricultural education. All the other children have to look for jobs offered by state in other fields of activity.

Table 3. Evolution of farm size recommended for Romania (1995 and 2005) (Heintz Muth, 1995)

	1995				2005			
	No (Thousands)	Size (ha)	Total land (thousand ha)	% of total	No (Thousands)	Size (ha)	Total land (thousand ha)	% of total
Family farms	3,600	**2**	7,540	51	64	**40**	2,570	17
Family associations	14	**100**	1,530	10	18	**300**	5,400	37
Commercial companies	4	**450**	1,770	12	7	**600**	4,200	28
State farms	0.6	**2,000**	1,330	9	-	-	-	-
Public sector	-	-	2,620	18	-	-	2,620	18
Total	3,619	**3.4**	14,790	100	89	**137**	14,790	100

II.2.3.Vertical integration –an imperative of agricultural modernization. The largest part of food cost paid by consumer is formed by processing, transportation, trade, preparation in restaurant cost and also profit for each branch involved in the product chain. For example, in the USA, a consumer spends 18 % income for buying food and Romania it is 3 times more expensive. The farmer receives only 6 %, therefore jus tine third of this money. This is the reason why integration along the product chain is compulsory between research, machinery industry, farmers processors, whole salers, retailers in order to respect and reimburse producer's work as achieved in many countries where cooperation and contracts are promoted.

II.2.4.The danger of monopolist concentration in the agro-food sector. The growth of farm size and vertical integration hide **the danger of concentrating business in the agricultural sector, the upstream and downstream sectors in the hand of a small number of international companies**. The startegical allliances between these companies will help them to apply the monopol policy and disadvantage farmers, becoming a restain against agricultural production. This danger was advertized by International Federation of Farmers (2002).

In 1991, the USA there were 156 poultry companies, each one having over 250,000 laying hens (22 over 1 million); they covered 67% egg need of the country (Drăgănescu 1992). Between 1989 and 2006, the number of the companies which controlled the world market of genetical breeding for laying hens, produced less chickens as follows : from 10 to 3 (1989) and from 11 to 4 broilers (2006). Romania is able to assure itself selection and produce one day chickens. In case of turkey hens, only 3 companies control the production and delivery of biological material at the world level. In the USA, the giant Smithfield produces 25% of pork (Gura, 2007). Three companies control over 50% of

food sales in Europe. Carrefour is the 2nd large world trust selling food. In the USA, 4 large companies process 74 % maize production, 62 % wheat production and 80 % soybean production. In the vegetal production, in the USA, 4 large companies control 69 % of maize seed production and 47 % of soybean seed production. The same aspects were noticed in the field of pesticides, fertilizers and machinery production and trade.

II.2.5.Agricultural land conservation. Territory systematization. Environment change.

Agricultural production (vegetal, animal, forest) is affected for medium and long term by market demand, climate and environment variations. As a result of demographical explosion which will ongo at world level in this century and of the high food consumption especially of animal origin, (Drăgănescu 2008, 2009), the demand for agricultural products will increase as well. The problem is if land, climate and other factors will satisfy this market demand.

The first Rome Club Report (1972, Drăgănescu, 2008) mentioned that one of the causes of food unsufficiency estimated for this century is the decrease of arable land due to the change of its destination. In 2003, FAO estimated that for assuring food for the globe population in the year it is needed 120 million ha arable land in addition, meaning 2 times more than France surface or 1/3 of India surface. This problem has to be important for the public opinion and decision makers. The identification and preservation of favorable and less favorable land for agriculture (FA and LFA) and the territory systematization have to be in the attention of everybody. Investors are tempted to change to frequently arable land destination. In Romania, land is a key attraction for foreign buyers and this has to be considered at international level (Gura, 2007).

Regarding climate change, Shaw (mentioned by Batie, 1980) considered that: (a) "the future climate can not be precisely forecasted", şi (b)"at present we must not be so much concerned by annual climate change, but by its long-term trends.". We have to mentione that the Americans present production data, followed by average and anuual variation of production in order to estimate much better its future evolution. Climate change is accepted in the limit of 4.4° C growth of temperature and 2.9 % precipitaion increase for the year 2080, when world production is expected to decline by 6 % or 16 % if fertilization is not applied. This decline is expected to vary between 10 and 25 % in various regions and production could decrease even by 60 % in some African countries, but in average by 16–27%, depending of fertilization effect.

II.3. SUSTAINABLE EXTENSIVE AGRICULTURE IN THE LESS FAVORABLE AREAS (LFA)

Climate, the share of the mountain area and the historical, social and economical conditions have been favorable along the centuries for practicing an extensive traditional agriculture in Romania, named after 1990 in the EU documents as "Agriculture of High Nature Value"(**HNVF**)", or **cultural landscapes** (Drăgănescu, 2003, 2010). Here, animal and vegetal production were associated in the same eco-systems with wild plants and animals, those systems assuring a certain production and nature preservation. Agriculture modernization which begun in the 19th century reduced step by step the area of these ecosystems to the mountain area (where cooperatives were not set up in the period 1950-1990 and the plots of the cooperative members from that time have the tendency to be generalized nowadays.

The manintenance of those systems of agriculture is encouraged by the EU CAP in the less favorable areas (LFA, Art. 18 19, 20, EC 1257/1999). They are considered also in other international documents (Carpathian Convention 2001, Science for the Carpathians-MRI etc), even though the Romanian experts are not present in the activity of these organizations. The sustainable conservation and development of these traditional agricultural system supposes :(a) a correct identification of the unfavorable areas for intensive agriculture ;

(b) type of agriculture recommended in various ecosystems in that area and also farm type.

The solving of this problem has to be object of some special studies. Some selected aspects are presented in this paper.

(II.3.1.). Identification of less favorable areas for agriculture (LFA). Despite that there are no precise mentiones regarding this problem (Rauta s.a. 1995 s.a.), in Romania this areas are not specifically delimited even though it is considered to be in the ex not cooperativized areas. In the EU, the identification of the less favorable areas (LFA) was launched in 1975 in order to maintain it as a support for agro-biodiversity and rural life by a special subsidy given to farmers. According to a provision of the EC 1257/1999, an area can be classified as a less favorable for agriculture in three situations (2^{nd} Axe - Sustainable Land Management "Policy of Sustainable Rural Development in the period 2007-2013): 1. **Mountain areas (**Art 19); 2. **Intermediary less favorable areas"(**Art. 19), including low productivity land and less populated areas or with a decreasing population depending especially of agriculture; 3., **Areas affected by specific handicaps (**Art.e 20): where environment has to be preserved or improved, cultural landscape has to be conserved, touristic potential and maritim coast as well.

(II.3.2.). Types of activities recommended in various areas. Accepting the EU classification into the two types of activities, we have to mnetion one more. It is about :

-Revitalization of some semi-intensive production systems, especially pastoral systems (transhumance, moving etc) in the mountain and marginal areas (LFA). The concentration of human settlements on the peaks of the mountains contributed to the saving of this national wealth and its existence in the territory and imposed to practice a traditional agriculture, including pastorship as a component of national heritage and economy.

-The develoment of organic agriculture and farms producing special products (wines, fat liver etc) especially in the marginal areas *(LFA),* maintaining the part-time, hobby subzistence systems for medium term.

-Activities for zoo and agro diversity (flocks and herds of breeds in danger to dissappear etc) in the protectd areas (IUCN), as practiced in some developed countries (United Kingdom, Germany, France, Hungary etc) (Drăgănescu 2003, 2010)

III.SUSTAINABLE RURAL DEVELOPMENT

Rural life, economic, artistical, ethical, religious traditions, a real national heritage, saved the physical and ethnical surviving of the speakers of Latin in this part of Europe. "Village was the specific basis of the Romanian people " as afirmed Gusti. Village was in the attention of philosophers (Blaga), ethnographs (Densusanu, Benea etc), sociologists (Gusti, Herseni, Stahl, Golopentia a.s.o), writers (Cosbuc, Rebreanu etc.), agronomists and zootechnicians.

The most prefered area to settle villages was the forest-marginal area protected from invadors (Botzan, 1996,etc.), aspect recognized by foreign researchers (Matley, 1970). In the Romanian State, after the Agrarian Reform in 1864, the village settlement was moved to better places maninly on land favorable for agriculture. Bernea (2006) mentioned that from that time, a fast change of the rural traditional civilizatoon has started to go to its crisis. Gusti (1925) and his School approached rural life from a scientific point of view (sociological monography, 60 studied villages, the village museum setting up, and a new more correct orientation was given to the evolution of rural life by the rural intelectuals, an students' teams and village « sons » and the ones left from villages (Law of Social Service) **We regret that their work is not continued and even not observed in the actual programmes.**

Bold (1969, 2003) made a complex study upon the evolution of agriculture as a component of rural life. **National Programme for Rural Development 2007-2013**, imposed by the EU (The Rural Development Program 2007-2013), provides some essential items of the rural development.

The core of the rural life (Axes 1,2,3), of the technical and social development and cultural-heritage specific to our national life deserves more attention in our opinion. We are trying to underline some aspects of economic and heritage development in the rural space taking into account their physical, cultural, natural and intangible character.

4.1.DEVELOPMENT OF SOME COMPLEMENTARY AND ALTERNATIVE FUNCTIONS OF AGRICULTURE

The concept of farm modernization means the increase of biological (production/consumption) and mechanical productivity (production/hour), resulting a **decline of jobs in agriculture**. As agriculture is only a component of rural life, the major social and economical problem is **to create jobs for the ex agriculturists.** This is a critical aspect that many policy makers do not understand. Klatzman (1976) was right to say „The problem of agriculture modernization lays outside of it ".

Stabilization of rural population is an imperative of the actual era and its solving imposes to create new jobs, new income alternatives, justified from an economic point of view. Only by creating services and rural tourism we can not solve this problem. It is needed to develop complementary or suplementary industries, to locally process raw materials, products and develop the local trade. This aspect is well known, but not solved yet. In 1936, an essay of the Sociological School entitled „ A beginning of industrialization of a Romanina village " (Vladescu-Racoasa) presented some difficulties of competence at rural and also at national level.

4.2.SISTEMATIZATION OF RURAL TERRITORY, LANDSCAPE PRESERVATION AND IMPROVEMENT OF RURAL ARCHITECTURE.

The chaotic and descentralized rural development which is running has to be stoped by Law. Normally, each village should have a plan of territorial systematization, of traditions maintenance regarding landscape architecture, the correct settlement of institutions, small individual gardens adapted to modern types of streets, canalization, avoiding the loss of arable land. Restoration and the new functionality of buildings and public space should reflect the economic, social, cultural and esthetical value of the local heritage. The World Bank has a strategy for the development of agriculture and rural life including 4 items : (a) assurance of a legal basis for a modern and in progress rural sector, (b) creation of an institutional framework for this sector, (c) recover of buildings or of the physical basis, (d) increase of the competitiveness in the sector. The basic objective of the World Bank in the rural areas from the underdeveloped countries is to diminish poverty and increase prosperity and the living conditions of the population.

(4.3.)PROTECTION AND RESTORATION OF CULTURAL AND NATURAL HERITAGE

Protection and restoration of the cultural heritage, artistical, ethical, hygienic and religious traditions is a very important problem at present at world level as important as environment protection. Cultural heritage is a visiting card for a nation.

Its preservation and promotion is one of the major objective of the rural development and has a deep contribution to life quality in the rural areas.

Vianu (1982) recognized the duality of popular culture: traditional folk culture and progressist folk urban culture. We added the term of « progressist » to the one of traditional, underlining that the cultural chaos of nowadays (culture by accident much helped by media) has to be avoided, as it is forbiden in other countries. There are 3 types of national cultural heritage as follows :

(4.3.1.)**Physical (« tangible ») cultural heritage including the whole physical environment created by man** (architecture, archeology, monuments, creations, agricultural sites), and **moving (mobile) cultural heritage** related to the national and local history (folk suits, folkclore in general). At EU level (ERDF) assures financial support for restoring buildings, settlements and mobile heritage.

(4.3.2.) **Natural heritage** includes rural landscape and natural environment, agrobiodiversity (animal breedsrase, plant varieties), natutal flora and fauna, protected areas by IUCN (biosphere rezervations, natural parks, scientific rezervations). What a pitty that in case of Romania, agrobiodiversity is not preserved.

(4.3.3.)**Intangible heritage** including aspects of the local cultural values (behaviours, customs, practices, conceptions on ethic and hygiene etc) and spiritual values (esthetic, artistical expressions, folcklore). Materialized both on the folk art and folkclore, this heritage is essential for rural life, but often it is difficult to be preserved under the pressure of the free mass-media. School and church can and have to support the preservation of the positive intangible heritage in the ethic and behaviours of the rural life. The local managers should be an example in this direction.

The conservation of the three types of rural national heritage could be helped for long-term and by the development of tourism. The large variety of the rural cultural heritage of Romania could become an attractive cultural destination. This is deeply demonstrated by Maramures region.

IV.STRATEGY OF RURAL DEVELOPMENT

The analysis of rural development supposes to establish the objectives, dominated by equalitarianism, pacifism, liberalism and a clear strategy to attain them. A few opinion on this are given below.

Popular culture is descentralized and the local cultural authoritires are responsible ot its level.***"Our vilagges are not identical one another. Anyone who would like to action in an efficient way in a village has to accept the existing differences between villages ans start its plan from this aspect. <u>The efficient actions require a deep documentation, and superficiality and amateurishness are more than a crime against your nation.</u>"***, afirmed Gusti (Draganescu, 2005). Each village should establish a model, a group of objectives able to represent in a correct way the reality and the strategy by means the reality to reach the model. This aspects require **objectiviness and competence and should be solved in a different manner for each locality. The village intelectuality is responsible of this.** Starting from the years 1935-1939, Gusti considered that "the cultural actions should be fundamented on a well done plan based on the village needs, and **agronomists, veterinarians, priest, teachers"**, and **"the ones who left the village, sons of the village, have to be brought back to their duties"**. Today we could also add the people from cities who built holiday houses in villages. The opera of the whole nation change should be carried out by elites, said Gusti"**<u>the quality of elites will determine the village quality".</u>**

CONCLUSIONS

Sustainable development of agriculture and rural areas is the only solution to recover Romania after the negative impact of transition period.

Production modernization is an imperative in the actual situation in order to increase production, agro-food product quality and competitiveness in the domestic and international market, to cover better comsumer needs and also to assure a corresponding profit and living standard for farmers and their family.

Taking into consideration the large diversity of agri-ecosystems existing in Romania, the sustainable development of agriculture have to be carried out by means of:

-revitalization of commercial intensive farms situated in the favorable areas for agriculture;

-revitalization and preservation of semi-intensive agricultural systems (especially pastoral systems in the mountain areas) and of organic agricultural systems in small commercial farms namely part-time or hobby subsistence farms.

Sustainable intensive agriculture is the main way to nourish the whole population and depends on farmers' training level, farm size, vertical integration along the product chain.

Sustainable rural development involves: stabilization of rural population by creating

new jobs and income alternatives in the rural space, assurance of the territory systematization, landscape and environment preservation, improvement of rural architecture, protection and restoration of the national natural and cultural heritage.

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SUSTAINABLE DEVELOPMENT AND THE PROBLEM OF A NATIONAL STRATEGY FOR SUSTAINABLE DEVELOPMENT OF ANIMAL PRODUCTION

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Abstract

The paper aimed to approach the topic of a new strategy for the sustainable and competitive development of Romanian agriculture and especially for animal husbandry. In this purpose, a large variety of studies was investigated and the opinions of well-known personalities were used to present in a critical manner the history of sustainable development concept, principles, causes, reasons, moments, events, institutions involved at international, European and national level, achievements. The study is focused on Romania, starting from the actual situation of animal husbandry and learning from the country own and others experience. During the last centuries, the scientific studies noticed that the growth trends of the world population and resources utilization which could determine complications for survival of human society. The first Report of The Club of Rome (1972) concluded mathematically that " if the present growth trends in world population, industrialization, pollution, food production, and resources depletion continue to remain unchanged, the limits to growth on this planet will be reached sometime in the next hundred years",..that is in the 21 century. As a reply, the international and national bodies adopted recommendations for a sustainable development. This study analyzed the problems of sustainable development of animal production in Romania, taking into consideration that the conversion rate of energy provided by plants to animal products is about 20%, and this decrease of the number of population is supported by agricultural food production. Two production systems are proposed: (1). Intensive production systems, with high forage conversion, in favorable agricultural country area; (2). extensive (free-ranging, transhumance, pendulation, sustainable, biological production) in not or less favorable agricultural area (mountain area, etc).

Key words**:** *animal production systems, civilization, collapse, food production, free-ranging production systems, resources depletion, sustainable development, world population*

INTRODUCTION

The economic, social, cultural life of mankind started at once with the appearance of agriculture, vegetal and animal production. The history of mankind developed along its way a series of great civilizations (Summerian, Asiarian, Egyptian, Greek, Roman, Maya civilizations, etc). *Each civilization has appeared, developed and fell.* **Which was the cause of these falls? How could be assured the surviving, the sustainable development of a civilization?** Referring to the civilizations from the „Fertile Crescent" (Middle East, South West Asia), Diamond (1997, p 411), as many other researchers considers that „*They killed themselves ecologically, destroying their own resources… Large surfaces from the Fertile Crescent are deserts, semi-deserts or arid areas or eroded or salted lands, not suitable for agriculture"..He also affirmed (2004) that our problems are like a bomb with a delayed explosion which could take place in less than 50 years".*

"Sustainable Development"

"*Before people it was the forest, after them the desert",* *Chateaubriand.*

The civilization of our era, which has begun in the last centuries, it looks **to be at the peak.** The volume and technical level of agricultural and industrial production, the living standard increased as never before the world population has an exponential growth. All these impose an exponential consumption increase of natural resources of the Earth. Even at the beginning of this development, many scientists warned that **these resources**

could be exhausted, living conditions and the present civilization could be affected. "*A maximum amount of life claims a minimum rate of natural resource utilization",* affirmed Georgescu-Roegen (1979, p.76). *Human behaviour across the last 200 years proved that man is tempted to be waste money". "Before people", noticed Chateaubriand (1768-1848), "it was the forest and after them the desert".* **Has our present civilization the capacity to maintain its structure and functionality for ever, to be sustainable**?

Reves (2005) made a real inventory of the different opinions of the so called "alarmists". He used even some severe expressions (imminent apocalypse, human cataclysm). He noted that the alarmists might be wrong, might be exaggerated, but they also played a positive role, drawing the alarm signal. This aspect is attested by the so called "caution principle" of UNO (1994): "***When there is the risk of some serious and irreversible disturbances, the absence of some scientific absolute certainties can not be used a reason to delay the measures****"*, said the Secretary General. In the last decades, the politicians have begun to be alerted. The problem of "sustainable development" is on the agenda of all the international and national organizations. The "alarm" was taken into consideration at the moment when **a more precise scientific clarification** was needed, more exactly in 1972. Even though it looks to be forgotten, it is useful to remember of it. **We can not set up an efficient strategy of sustainable development if we are not conscious of its significance or importance.**

At the EU recommendation, a **National Strategy for Sustainable Development for the period 2008-2030** has been established in July 2008 at National Center for Sustainable Development of the Ministry of Environment and Sustainable Development (HG 1216/4.10.2007)**.** This strategy was publicly debated. **Ministry of Agriculture and Rural Development** issued a **National Programme for Rural Development 2007- 2013**. This paper is a response to this challenge.

MATERIALS AND METHODS

The paper is a reply to **National Programme for Rural Development 2007- 2013 established by the Ministry of Agriculture and Rural Development.**

It presents the author opinions, based on a critical evaluation of many papers collected across the time due to its interest on this topic. In this purpose, a large variety of important publications belonging to well known personalities was studied. The author contribution consists of his own vision on the logics of the concepts, principles, objectives, techniques, actions, measures a strategy has to include.

The paper refers to important moments in the history of strategies destined to assure the sustainable development of agriculture and rural areas, mentioning personalities, events, important documents, international, European and national institutions involved.

The main instruments used to set up this paper have been: the large information collection, the logical connections between facts and events, critical analysis and logical synthesis, logical deduction and critical approach.

The ideas presented in the paper belongs to the author, but many of them are supported by strong arguments provided both by his own research and articles published across the time, but also by other personalities in the field.

RESULTS AND DISCUSSIONS

Is there a danger as the present civilization not to be able to maintain its structure and functionality ?

In April 1968, Dr. Aurelio Peccei, an industrial manager, economist and an open minded and visionary person invited 30 and later 75 scientific, cultural and political personalities, even from Romania (Maliţa, Isărescu) from 10 countries and further from 25 states in order to discuss the present and future of mankind. After this meeting, the Rome Club was founded. As we know it is an non formal international association whose goal is to clarify the interdependence and

effect of various economic, political, social, natural factors on the evolution of human society. A project on "**The Future of Mankind"** was proposed that time.

The Rome Club called a series of scientists, including also personalities from the field of **mathematical modelling** like Professor Jay Forrester, from the Institute of Technology in Massachusetts, USA. We have to underline that "mathematical modelling" is the basic method used to study a system for decision making optimization at present.

At the meeting of the Commission in **1970, Forrester**, who studied the dynamics of systems, presented **"a global dynamic model",** an equation reflecting the evolution and prospects of mankind. "The mathematical calculus is a more precise "language" than the spoken one", affirmed Forrester". He started from the premise that along its history, mankind was marked by the continuous growth of population, living standard and geographical thresholds. Simplified, Forrester model includes the peculiarities and effect of the interaction between **5 components of world system: 1.** Fast global population growth; 2. malnutrition, food production per inhabitant; 3. accelerated industrialization; 4. non-renewable resource exhaustion; 5. Environment degradation.

It seems that Forrester left the working team and applying his model, he wrote a book entitled **"World Dynamics**" (1971). A group of 4 scientists, having as leader Donella H**. Meadows**, from the same institute, wrote, based on Forrester model, the first report of the Rome Club entitled **"The Limits to Growth"(1972).**

It presented in figures the evolution of the five components of the world system, the effect of their interaction and the possibility to control this effect. The conclusion of the report, mathematically demonstrated, was: "**If the actual trend of population growth, industry growth, pollution, food production, resource exhaustion will continue to be unchanged**, ***the limits of the development on this planet will be attained in the next 100 years*****"… .** Therefore it is about the 21st century.

Meadows report represented the basic material for numerous discussions and probable for the **measures which are taken at national and international level**. The coming reports of the Rome Club and other works, including the ones written by Brown, Director of Worldwatch Institute, founded in the USA (1975) in order to study this problem, were translated into Romanian. Numerous Romanian papers (Iliescu, Puia, Gruia, Gheorge (ed), Hera (ed), Răuţă, Otiman a.s.o. debated this problem. This paper does not intend to present the report and analyze it, but two diagrams look to be of high interest (Fig.1 and 2).

The first figure presents the standard model of the effect of the simultaneous actions of the 5 factors in the period 1900-2100, supposing that each factor will evaluate like in the period 1900-1970. It can be notice the danger of a fail of the actual civilization after 2050-2060.

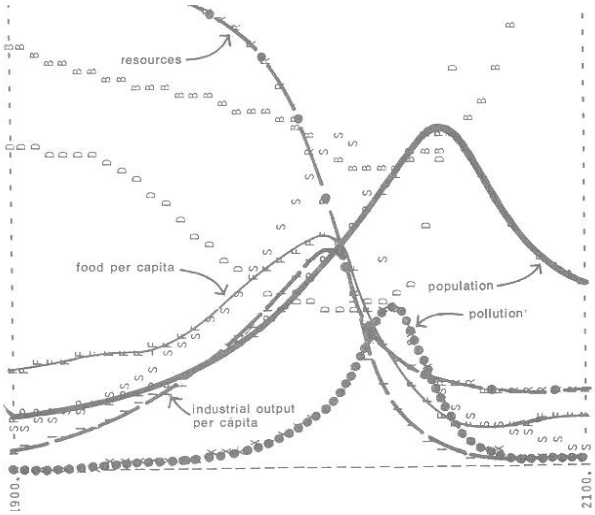

Fig. 1. The possible fall moment of the present civilization, if the growth rate of the 5 essential components of World System in the period 1900-1972 is maintained (Meadows, 1972)

Looking for an economic and ecological sustainable solution by stopping population growth in 1975, stabilizing industrial capital starting from 1990, the resulting funds being directed to education, health, agriculture, reducing pollution by one third in 1970, recycling resources etc, the authors have drawn the conclusions presented in Fig.2.

The 1st Report of the Rome Club, contested and even passed in silence**, determined a real**

"earthquake", as Puia said (2001). Do we destroy our own existence basis? The fear of panic was probable the explanation that this report was not translated into Romanian. It is rarely mentioned even at world level and a few people know it.

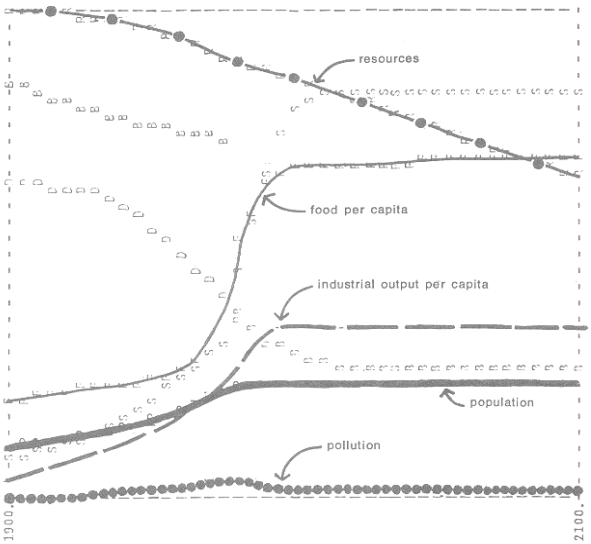

Fig. 2. Solution to avoid the fall of the actual civilization by controlling in time (1975-1990) the growth rate of the 5 components of the World System (Meadows, 1972)

The measures of sustainability proposed in this report have never been applied. In fact, they could not be applied in the provided times and also some measures were non equitable (stopping the industry development which could affect the less developed countries). Valery Giscard d'Estaing, ex-President of France affirmed: "*Mankind is unhappy because it does not know where it is going and because it guess that, if it knew, it would discover that it is going to a catastrophe"*. Forrester said in 1971: ***"The global balance is theoretically possible. If it could be achieved, it is another problem*** ". Pecei (Botkin, 1981) was more severe and affirmed:"*we could suppose that mankind is lacked of wisdom, despite its greatness", men and women of nowadays are not able yet to fully understand the sense and consequences of their actions"*. Brown (2001, p.311) has warned: "*Could we join to build an supportable economy? Or we stay with our unsupportable economy by environment till the moment when the decline will begin? A way or another, **the choice has to be made by our generation. It would affect life on the Earth for all the next generations."***

The chance of sustainable development

Future looks to be uncertain. But there is a hope that our mind could find solutions. In fact, man is looking for them. Thousands of researchers, who are working in the strategical institutes of some countries, study these problems. May be it wise to pay attention to Oysten Dahble (cited by Brown (2001), who said: "The socialism collapsed because did not allow as prices to say the economic truth. The capitalism could collapse because it does not allow prices to say the ecological truth",.. though we think that they start to tell it (the oil case).

Usually, when sustainable development is approached, it is mentioned **the definition given by Bruntdland,** President of UNO for Development in 1987 *(„Sustainable development is that development which satisfies the needs of the present generation without compromising the chance of the next generations to satisfy their own needs").* Without denying this, we consider that the definition is too pathetic and shades **the complex core of the problems** mentioned by Meadows' Report.

United Nations actions

"***Every civilization died isolated, without affecting the others. But today, in a global integrated economy, the collapse of a country or region will affect all of us" Lester Brown 2001.***

The alarm regarding the fragility of the world ecological, economical, social system was **received by UNO and may Governments.** Meadows' Report was **presented in UNO General Assembly,** together with other reports of the Rome Club **(**Session XXXI), attentive to these problems**. After** the World Environment Conference (1972 -Stockholm) and the foundation of UN Programme for Environment (UNEP-1972), a World Commission for Environment and Development was set up (WCED-1983) and a Commission for Sustainable Development as well (1992). Two UN World Conferences on Environment and Sustainable Development („Summits") took place (UNCED). **The first**

Conference in Rio de Janeiro (1992), includes especially the **Agenda 21** (Action Programme for the 21st century) and Convention on Biological Diversity (**CBD**). The 2nd World Conference was on Sustainable Development and took place in Johannesburg (**WSSD,** 2002).

Among the numerous conferences and reports of UN Commission for Sustainable Development we mention the one regarding Sustainable Development of Agriculture and Rural Development held in 1998 and 2000 and the one which took place in 2008. Normally, the documents of these meetings should be on the table in all the countries which signed them and when any decision is drawn.

The essential objectives of a sustainable economical, ecological and social development have to be three: **1**. Poverty eradication, **2**. Change of unsustainable production and consumption manner, **3**. Protection and management of natural resources needed by the economic, ecological and social development. Obviously, all of them also regard agricultural production, including animal husbandry and rural development. They are obviously compulsory for Romania too.

European Union. Sustainable development has become an EU declared objective starting from **(Maastricht Treatise).** The **s**ummit from Goetheborg (2001) and the Agenda from Barcelona (2001) have developed the principles established in Maastricht. A clear and concrete vision upon these principles was achieved in the Strategy for Sustainable Development for an European Union, approved in June, 2006. The core of this strategy is the long-term viability of the European society which deserves to be analyzed in more details. Agriculture is a part of the socio-ecological-economical responsibilities regarding all the sectors (rational use of resources, environment protection, rural development etc). This evolution corresponds with the change of Agricultural Policy from the one based on large subsidies to the one more oriented to the market economy aiming to modernize and maximize production, to keep pace with the open competition in the world market. The economic competitiveness is on the top position on the political agenda, which also happened in Romania. Even though the main goal is the sustainable world development, each country has to be focused on its evolution and surviving.

Romania. It is probable that in the 1970s some measures for a sustainable and competitive development were taken (waste recycling, energy assurance etc), even though they were not declared. In 1998, the 1st strategy for sustainable development was established by Law. At the EU recommendation, it is under review. The new National Strategy for Sustainable Development (SNDD) will be finalized by the end of the year 2008. Its objectives have to be finished by the end of the year 2013, its engagements regarding adhesion by the end of the year 2020 when the development level has to suit the EU level in 2007. By the end of the year 2030, Romania has to reach the average EU-27 development.

Agriculture, animal production- major component of sustainable development

"The right to food" is a right recognized for all the people, therefore, agriculture is a major problem. Declaration on Human Rights (1948) and other UNO documents mentioned this. The day when FAO was founded, October 16, 1945 is the world food day. **Food assurance is the first guarantee of internal and external security of any country**. Its absence leads to internal and external conflicts and affect its surviving. Agriculture is a major factor of mankind longevity. Its moment of appearance is the moment when civilizations were born. (Diamond, 1997).

To promote a sustainable agriculture and rural development is a complex problem and also important, as mentioned in the Agenda 21 and CBD. Chapter 14 of the Agenda 21 is entitled **"Promotion of Sustainable Agriculture and Rural Development"**. World population is still exploding from a demographical point of view, and what is sad is the fact that a part of it suffers of malnutrition. **Klatzman (1985) said** that only 5 % of the earth population is

normally fed (2,700-2,800 kcal, 40 g. protein); about 20 % is **overfed (over 3,000 kcal and 5o g. protein), about** 15 % suffer of **general malnutrition** (**2,500 kcal, protein and vitamin deficiency etc),** about 20 % suffer of **protein malnutrition**, **about** 30 % is **underfed (about 2,000 kcal, protein and vitamin deficiency etc), about** 10 % is **hungry (about 1,500 kcal=1.2 metabolism of 1,200 kcal; hungry people (less than 1,200 kcal).** Food security, poverty eradication is a major component of sustainable development. Besides the demographical explosion, the increased urban population is a critical eco-socio-economical problem which complicate food assurance and sustainable development. That is why rural development is so important nowadays. It is compulsory to stop migration from villages to cities. The rich countries can not ignore the poor ones. Social movements, emigration caused by poverty could affect them. Besides the encouragement of the poor countries development, immigration has also to be stopped. Food problem involves many aspects. It was said that **"USA food gun" could be compared to "OPEC oil gun" (Batie, 1980). ..**Paraphrazing Brown, the collapse of a country will affect all of us but not in an equal measure. **The ones who know to protect themselves (Diamond, 2004, Chap.9) and are more competitive would be less affected**. We hope that Romanians will understand this. **In this complex context, we have to look for the answers to two questions.**

-Could food be assured for all the globe population?

The present civilization is especially a civilization of energy. The most sustainable energy source is the sun, and plant cropping is the major way man can accumulate and use. The maximum use of sun is not a simple problem and the duty of agriculture is very difficult. The proportion of solar energy retained in plants is small**. Agriculture has to produce food in a sustainable way (without rainfalls, pollution, environment degradation and natural biodiversity) in order to eliminate undernutrition and malnutrition, to assure food for a population in a continuous demographical explosion, to compensate the loss of agricultural land due to buildings, degradation etc.**

All these suppose **substantial increase of production per unit of agricultural land and animal.** Meadows report some aspects of this dramatic task. Accepting a high growth of food production per ha (2-4 times more than in 1972), it looks that after the years 2000-2050 it is the danger as food production not to be able to keep pace with the demographic gain and food improvement requirements (Fig.3). There are some different opinions about the number of people who could be fed by Earth. Georgescu Roengen (p.75) opined between 5 and 45 billion people. Other experts consider that Meadows report is right. Klatzman **estimated about 11 million for the middle of this century. He also said that:** "world food in the next decades is a delirious utopia". It is clear that the duty of agriculture and animal husbandry is to assure its increase of production per ha and animal for long-term and in a sustainable way. This is the big problem to which each development strategy has to answer at national and world level. **The paradox is that the intensive production system, often a non ecological one, has to be maintained and transformed into a sustainable one!!**

-How could food be assured for the world population?

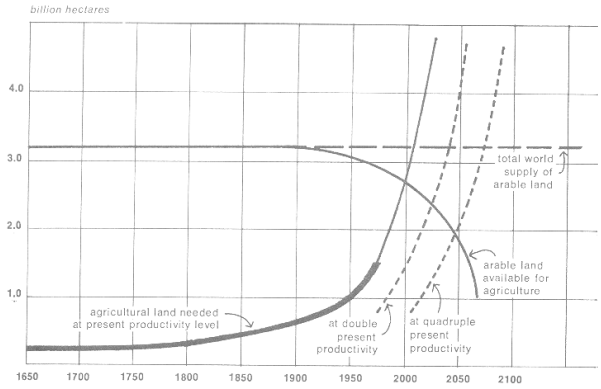

Fig. 3. The possible moment when agriculture would not be able to assure food for the globe population in demographical explosion growing even 2-4 times production per ha or animal compared to 1972.(Meadows, 1972)

Agriculture covered food need in the years 1950-1990 and to continue to cover it involves a high production intensification**.** Strategic reasons stimulated after 1945 the application of many measures destined to grow agricultural production. The "green revolution" (1943-1973) and the EU Common Agricultural Policy (Treatise from Rome, 1956, Art. 39).

They are based on a new thinking about a new model of agriculture - **(High-Payoff Input Model)** as Ruttan mentioned (cited by Drăgănescu, 1998) (**1).** Capacity of scientific research institutes to produce new techniques; **(2)**. Capacity of industrial sector to produce technical endowment abe to use fertilizers, pesticides, equipment etc), **(3)**. Farmers' capacity to assimilate knowledge and technical endowment **(4)**. Vertical integration directly or by cooperation of enterprises across the product chain. It is expected a maximization of production per ha and person, agriculture and animal husbandry industrialization. It is a certain renunciation to the old political principle of the market economy -"laissez faire", and direct state intervention, what it was done.

Rockefeller Foundation together with the Mexican Government initiated an agricultural programmes aiming production maximization by using the new model of agriculture (**Green Revolution**). In fact, the model also aimed to stop illegal immigrations in the USA. In 1957, Mexico assured the need of grains for the 1st time. The programme was extended in other countries too. The agronomist Norman Borlang received Nobel Prize. The increase of oil price by 1,000% since1973 (fuels, lubricants, fertilizers) blocked the Green Revolution in the underdeveloped countries.

Under **the impulse of the Green Revolution success** (1940-1973) and of **strategic competition** between the military blocks, animal and vegetal production contributed to the increase of production per ha and animal by 300 % in the NATO countries. The mechanism of this development has clearly appeared from the EU documents and actions. The major objectives of the EU CAP included in Art. 39 of the Treatise of Rome (1956) and finalized by the Conference in Stressa (1958) are:

-To increase agricultural productivity by encouraging the **modernization of holdings** (a French paper since 1965 was entitled "Une France sans paysans" !);

-To guarantee **an equitable living standard** for the agricultural population comparable to other sectors;

-To guarantee **food supply security at reasonable prices for consumers**.

The objectives were fulfilled by a severe intervention (**1/2 of the EU budget for subsidies, guaranteed prices** etc.) in the market economy (in fact the abolishment of the "laissez faire"). The French agricultural production increased by 3 %, meaning that it become double in 25 years, active population in agriculture decreased by 3-4 % (50 % decline at every 20-25 years), labor productivity increased by 6-7 % per year (it doubled its level every 10 years). The treatise of Rome (1956) has led to a remarkable prosperity. An insignificant minority of population, 5-20 times smaller than in Romania, is **able to produce too much food, it is true that at a higher cost compared to the world one.**

Romania succeeded to modernize animal production in the period 1965-1989. Despite that pig industrial complexes assured only **60 % of meat production in the country i**n 1985, and the poultry farms ony **44.7% of poultry meat production and 42% of egg production**, the difference being supplied by the private sector, **Romania was situated among the top 10 countries in the world** taking into account production modernization in these fields of agriculture. More than this, in the field of pig production modernization Romania was a "pioneer" as the well known British expert M. Bichard affirmed.

Facing an expensive overproduction, subsidized and non competitive in the world market, t**he EU agriculture is obliged to change (Mc. Shary Reform, 1992, Agenda 2000).** The EU subsidies used so far for production intensification will be reduced and reoriented to the protection of resources

(environment, nature, genetic resources etc.), rural development, animal welfare and health, food quality. Production extensiveness is encouraged, but farm modernization continue to remain a major objective in the free market, without any subsidies. The CAP deserves a special attention for our country. This will raise serious problems for the sustainable and competitive development of animal production in Romania.

UNO Commission for Sustainable Development, discussing about Sustainable Agriculture and Rural Development (2000) has warned that in 2020 about 40 % more cereals should be produced in order to nourish the world population, but cereal production has begun to decrease after the green revolution. **The solution recommended by the Conference was: sustainable production intensification, vertical and inter-sectorial integration. For Romania, this means revitalization and sustainable development by innovation and high productivity of the ex industrial animal complexes which are privatized.**

The need of animal production growth -a dilemma or a certitude?

Animal production has a difficult position in the human being trophyc chain (Drăgănescu, 1984, p.31,32). The conversion rate of the plant energy to human being is about 20 % (varying from a product to another). This would mean that **animal production could reduce 5 times the number of population who could be fed on the Earth.** Of course, it is an exaggeration. In human diet, the share of animal products is not 100%, some domestic animals, especially ruminants, consume plants or plant parts which can not be consumed directly by man and human diet needs animal protein.

The reasons presented above made some people to doubt in this moment of demographical explosion about the perspectives of animal production or at least of the species competing with man for food …However, **a FAO study forecasted that in the year 2020, it will be a world explosive demand for animal products and a need to increase it more.** The European food system is taken from the ex-underdeveloped countries. Together with urbanization, this determined a high growth of animal products in the world market. The countries with a strong animal production, it is not about Romania in this moment, had a large market and high profit. It is sure that, today, the dilemma of the existence of animal production supports its development. How? This is the problem!

We discussed the lessons from the past and the requirements for the future in the systems of animal production (Drăgănescu, 2003, 2005). We think that at present, it is useful to present some FAO conclusions (2007). **Animal production of the year 2020: the next food revolution!** This is the title of a paper carried out by Delgado et al., (1999), published under the auspices of Research Institute for Food Policies (www.ifpri.org). We do not discuss the details of this problem for the moment, mentioning only a few remarks upon its dynamics presented in the FAO Report (2007).

-The engine of animal production systems is at present: increased demand and evolution of animal products; technological evolution, trade development; environment changes; political decisions. *"The large-scale industrial production is rapidly extending in the developing countries"*

-Subzistence and small commercial production systems remain important especially for poor people and in the marginal areas. They require a special attention.

-New functions appear for animal production regarding landscape and vegetation management by grazing.

-Consumer demand is more and more influenced by reasons related to raising conditions, animal welfare, product taste.

-The main negative ecological influences of the domestic animals are: gas emissions with greenhouse effect (ruminants); deforestation for agriculture; soil and water pollution by dejections.

The problem of a new strategy of sustainable and competitive development

Vegetal and animal production of Romania is not sufficient and efficient from an economic point of view, and often not competitive. From an exporting country, Romania has become an importing one. Food security is a problem. Food cost represent up to 50 % in the home costs in Romania compared to 9.5 % in United Kingdom! Economically and socially, this means poverty, lack of political viability. May be the dissatisfaction of UNO General Secretary, expressed at the 3rd meeting of the Commission for Sustainable Development (1995) and discussed again at the 8th meeting (2000) that "evolution to a sustainable agriculture and rural development is going slowly in many countries". Is Romania among these countries?.

The actual situation imposes **a new strategy of sustainable and competitive development of animal production in Romania, with principles, methods and efficient techniques, clearly formulated.** The three principles of the Treatise from Rome (1956), presented above, first of all the **modernization of holdings, have to remain major objectives for Romania.** The technical and financing aspects destined to support the implementation of these principles by FEADR are the main goals of **National Programme for Rural Development** (Measure 121-Agricultural holdings modernization). **National Strategy for Sustainable Development can** not avoid the problems of the development of agricultural production, implicitly of animal production. The manner how the **strategy of sustainable and competitive development of animal production is formulated in these documents must be discussed and analyzed,** as the ones who elaborated it asked. It is needed to clarify the objectives, the causes of the lack of efficiency and how to eliminate them. **Treating the symptoms and not the causes, the problem of the actual "disease" of the animal production is not solved**. The CAP has clearly mentioned that the small and non modernizable farms are not efficient, they have to be replaced by large modernized farms and in this respect it a provided clear actions, it is true using high financial resources (replaced with terror in some countries).

The problem of setting up such a strategy is not quite simple. This paper tried only to open a door to this problem. It is not enough space to present and sustain opinions (in fact, presented by us in other previous papers). But ..a few of them deserve to be mentioned here..

Some imperatives of the sustainable development of animal production

For short-term, Romania should increase production at least at the level required to cover consumption under the free market. This imposes the following:

-**In the agricultural area and optimal from a social point of view**, farms must be modernized; the share of the **large commercial, industrial-intensive and commercial-extensive farms** has to increase by **revitalizing in a sustainable and competitive manner industrial farms, but also stimulating other systems ("part time"etc).**

-**In the marginal areas of the country (**mountain and submountain areas, etc) with semi-natural vegetation, "natural value areas" as they are named by EU, because they allow the preservation of natural biodiversity too, it has to stimulated and even subsidized the development of the extensive systems of animal production. First of all, it is about "pastorship" (moving, transhumance, sedentary), but also the so called "organic agriculture" (also named "ecological", „biological"etc) and forms of subsistence agriculture. In fact, some of them keep the history of the Romanians alive and offer key proofs of the nation existence.

-It is required a study in order to clarify the extent of the areas. The problem is a complex one. **The EU finance research projects destined to establish classification indices (E. Bigal, 2007).**

-Vegetal production has to increase the fodder production at the world market price or animal production should assure the fodder import covering the export expenditures by animal products.

-When livestock needs to be improved, we have to take into consideration that animals are a component of an ecosystem. For this reason, **import of animals has to be done when it is required and must take into account their ecosystem of origin as well** (this is available only for poultry and pigs which could be industrially raised). It has to be avoided the import of reproduction animals based on advertising, affecting the existence of the adapted local populations and ongoing the crises of acclimatization, implicitly of lack of economic efficiency. We proposed to limit the imports in close relationship with the sanitary-veterinary legislation.

- **Vertical integration** has to be encouraged by cooperation or directly on the product chain: supply, production, processing, commercialization, in order to distribute in an equitable manner the benefits, to avoid the pressure on production and consumers from the side of processors, traders and suppliers assuring farm inputs.

-Farm orientation for **maximizing the biological efficiency** (production/animal) and **mechanical efficiency** (production/worker), for **minimizing the consumption of exhausting resources, pollution minimization, preservation of cultural landscape and assuring a normal animal comfort, for rural development.**

-Development of farm capacity to make innovations and continuously assimilate new efficient technologies.

-Stimulation of the capacity **to be competitive** in the world market not only for the delivered products but also for producing and selling reproduction animals; accent on the professional and social deontology.

-The use of the qualified labor in the intensive and extensive animal production, assuring a competitive training for farmers and workers, the development of scientific research including the operational one, assuring the participation of experts in the decision making as it happened in case of the national strategy for sustainable development.

-The use of well trained farmers, with high knowledge, practical experience and managerial abilities.

- The increase of labour productivity will change the structure of the rural localities. Many of them will be rural localities, but not primarily agricultural localities, as many mountain localities are at present. It is needed to create jobs for the rural population and this agro-urbanization will increase the difference between rural and agricultural.

The setting up of a strategy of sustainable development is a difficult problem. First, it requires high human competence in the place where they are. The underdeveloped countries are underdeveloped because the scale of human values is not understood. This affirmation made in Curry Report is available for Romania too, regarding the difficulty to change at present the Common Agricultural Policy in United Kingdom (Drăgănescu 2003,2004): „ **The actual system is not sustainable for long-term** ": but **"To change the way of a large industry like agriculture is like you try to turn around a boat in high speed. It requires time, courage, vision and cooperation from the part of the whole crew" (** of all the scientific, technical and political factors)**.**

CONCLUSIONS

The civilization of our era, characterized by an exponential growth of consumption and world population, will exhaust the Earth resources, including food, leading to a major crisis of mankind, which could affect Romania too. In this context, it is required a profound analysis of agricultural production and animal production as well. Animal production occupies a difficult position in the human trophic chain.

The conversion rate of energy coming from plants to human being is about 20 %. This means that animal production could reduce up to 5 times the number of human population which could be nourished on our planet. However, thedemand of animal products is continuously increasing. In this complex situation, Ronania looks to be able to carry out food of animal origin in a sustainable and competitive manner. They are demanded both in the internal market but also for export. In

this respect, the following measures are imposed: (a)In the optimal agricultural and social area, intensive farms have to be developed; the share of the commercial, industrial-intensive and commercial-extensive holdings has to grow up, by the sustainable and competitive revitalization of the industrial farms and also stimulating other intensive production systems ("part time"etc); (b)In the marginal areas of the country (mountain and submountain areas) with semi-natural vegetation, "areas of high natural value" as named by the EU, because they allow natural biodiversity preservation, and also the maintenance and development of the extensive systems of animal production has to be stimulated and even subsidized. Firstly, it is about pastorship (swinging, transhumance, sedentary) and also about the so called organic agriculture ("ecological",„biological"etc) and other subsistence forms of agriculture.

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PASTORSHIP AND THE ROMANIANS' ETNOGENESIS - VALACHIAN CORKSCREW HORNS SHEEP BREED ("RATSCA") - AN INTERESTING BIOLOGICAL AND HISTORICAL DOCUMENT

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Abstract

The Corkscrew horns Valachian sheep it is a breed from the Early Egyptian (Ovis paleoegiptica) phileic group, located in Serbia, Montenegro, Panonia, and Romanian border with Serbia. The tribe was named by Buffon (1780), Darwin (1865) Valachian, by Serbs Corkscrew Horns Valachian (Valaska vitorogta), by Hungarian Racka (=Serbian), by Linnaeus O.a.strpsiceros. The translation of strepsiceros into German=Zackel (Nathusius 1890), produced a confusion with the Valachian philetic group descending from the Thrakian philetic group. To avoid confusion, we proposed (1994) to use for this philetic group the Serbian name Valachian Corkscrew Horns. It is a sedentary sheep, not adapted to transhumance and to big flocks, not adapted to support wintering in open field, even to stay in the rain. Have a smaller weight of fine fibbers in the mixed wool, it seem black colour recessive, inverse than in Valachia (Tsurcana) breeds. I*t is economically not competitive with others local and improved breed and it is in danger of extinction in Serbia and even Romania and well conserved in Hungary. It was considered as an historical document (Dunka 1984) and perhaps it is. Document the former existence of a Valachian tribe in this area, implicit the Valachian contribution to the ethno genesis of nations from this area. As an interesting genetic resource, but also for the aesthetic aspect of his horns and for some cultural reasons it deserves to have a good genetic conservation program.*

Key words**:** *biological and historical document, Corkscrew horns sheep, mixed wool, pastorship, preservation, Romanians' etnogenesis, sedentary, Valach, Vlack*

INTRODUCTION

"Serbians like Hungarians learnt pastorship from Romanians"(Bogdan Petriceicu Hasdeu, The origins of pastorship in Romanians, 1974).

The Valachian Corkscrew Horns sheep breeds, was firs presented by Buffon (1780), after a description of Colinson, under the name Valchian ***("Brebis valachienne")***. Colinson noticed it in the former Yugoslavian space, being perhaps the sheep of some Valachs (Romanians), as in fact, the Serbians call it Valalachian Corkscrew Horns Breed, ("Valaska"- Belic, 1980,"Vlaska vitoroga"- Stojanovici, 2003, "Vlach screwhorn"- Mason, 1988). Many scientists of the 18th, 19th and 20th centuries, including Ch. Darwin (1865) presented it under the name given by Buffon or with the specification that it was about the sharp horned sheep breed (Le Mouton a Cornes Pointues). The last morpho-descriptive specification is the translation of its descriptive-taxonomic name given by Linnee **(Ovis aries strepsiceros). N**umerous ***drawings and photoes, (14 synthetized by N.Crăciun on internat), accompany its presentations***.

In order to avoid a confusion to others breeds named also Valachian, but taxonomically distinguished, we recommended (1994), the use of the Serbian name. The Hungarians name this breed ***"Racka"***, not noticing that that it means "Serbian"(Raks=Serbian).. The Romanian scientists accepted the Hungarian name "Ratska"), except some scientists (Maior, 1899) who understood its correct name of "Serbian". Cornevin (1890), refering to the Balusa breed as called at the moment, presented this bred under the name "from Montenegro". Nathusius (1880) translated into German the term of "strepsiceros" (sharo

horns=zackel), given by Linnee, naming it ***Zackel***, an eronated name extented to all the the Valah sheep (Ţurcană etc), which in fact have no taxonomic links with the Valahian Corkscrew Horns Breed.

As we can notice, in the classification of this breed, like in the whole zootechnical taxonomy, it still persist names and many errors with negative technival and economical impact. As we affirmed, (1998), it is "a real comedy of errors".

We note that naturalists, such **Buffon and Linnaeus,** established valid systems of identification, classification and nomenclature for the extraordinary diversity of plant and animal species, a common language for all biologists. Linnee tried to put order also in the kingdom of domestic animals. He used a binary denomination for the sheep breeds (O. aries: rustica, hispanica, anglica, policerata, africana, laticauda guinesis, strepsiceros).

Photo 1. Les moutons a cornes pointues (A.E.Brem, Le Merveilles de la nature, Les Mamiferes, p.642)

The great diversity of domestic animals, the lack of clear and satisfactory criteria for classification could not solve the problem till nowadays. FEZ (FederationEuropeene de Zootechnie) tried to approach the problem from a scientifically. FAO did not do this. An important contribution was brought by Mason, who warned about the need of a taxonomy, but because of the difficulties to obtain comparable information about all the breeds characters and the variation of the names for the same breed, he was forced to set up a "Dictionary of Breeds"(1951, 1969,1988, 1999).

The objective of this paper was to illustrate and correct some taxonomical and cultural errors (nomenclature, description, classification) connected with this breed. It aimed especially to present studies regarding the breed from Romania. Practically, we were obliged to make concerns to the breed of Serbia and Hungary too, because they are similar breeds and probable not reproductively isolated as in the 1960s, Hungary imported sheep nuclei from Romania. We mention that in Hungary, for scientific reasons and/or historical reasons, this breed is well preserved and studied (Bodo study, for example).

MATERIALS AND METHODS

Our researches started in years 1994, being encouraged by some data presented in a brochure written by Dunka Bela, Nathusius' book and the visit in the Hungarian rezervation where Racka Sheep is preserved, it si about Hortobagyi Nemzeti Park of

genetic resources. The documentation continued with visits and studies carried out together with Palas Research Institute for Sheep Production and Caransebes Research Station. The visits were done in small peasant households raising this breed in 4 communes of the Dogneci area, close to the border with Serbia. We tried to also see the breed in Serbia and at the Caransebes Research Station we noticed that it was established a small nucleus of this breed. Some direct investigations made there have been of much help to set up some papers and communications.

RESULTS AND DISCUSSIONS

(I)Breed origin and classification. Related to the origin of the Valahian Corkscrew Horns Sheep Breed, there are two suppositions.

(I.1.)Breed origin

(a)The first supposition, resulted from the first name, given by Buffon and maintained practically by all scientists of 18-th, 19-th even 20-th century, starting with Colinson-Buffon, Darwin. This name point out that this sheep has been the sheep of some Valachian, respectively Romanian, being known that this name was given to the Proto-Romanians and Romanians after the power change in Constantinopol (in the year 641, the Latin, the official language was replaced by Greek language), and the Slavians coming. The location attested by Serbians and Hungarians, is a proof that te Valahians, the owners of this breed, had the origin in the Panonico-North Serbian space, and the one registered by Cornevin included the Montenogro and Serbian-Panonic space. We suppose that the breed was brought in Romania during the Roman occupation, therefore befire the period of migrations, before the coming of Serbians and Hungarians. The Romanians brought some animals from the Middle East (Merino and probable Tsigaia breeds). The Thrako-Geto-Dacs, the other ancestors of the Valachians and inhabitants of this area, had not this sheep like any other people in Europe (Greeks, etc). We note that their "Valachian" breeds (Ţsurcana breed), like othe two breeds broght by Romans (Ţsigaia and Ruda breeds) also attest the actual and old location of the Romanians.

This supposition is attested by **Ryder şi Stephenson** (1968), cited by Vicovan (2006). Ryder and Stephenson studied the origin of the Valahian Corkscrew Horns Sheep Breed, metioning that in antiquity there were only two groups of sheep with this type of horns: (1). 5,000 years ago, in **Mesopotamia** (Iran, at present), there were sheep breeds where only the rams had corkscrew horns. (2)In the same period of time, in **Egypt,** there were corkscrew horns sheep breeds for the both sexes. *Ryder noted that the Vahian bred remings of the Egyptian one*, despite that there are no differences between them. The Egyptian breed had loppy ears, short wool and long legs. A breed of such a type still exists somewhere in the North-Eastern Africa, mentioned Ryder.

A complication of the problem which needs a historical and scientific analysis is given by the fact that another Corkscrew Horns Sheep Breed named "**Balusa" (**Baljusha-Stojanovici, 2003) situated in Kosovo-Metohia, in the way to Montenegro, only the rams have horns, the ewes being hornless (like the old breed from Mesopotamia). ***Were there two Proto-Romanian tribes, one in Panonia and another one in Kosovo-Montenegro***? The document is certain and the problem is interesting from a historical point of view. Darwin (1865), citing Youatt (1841) mentioned only the breed where the both sexes had had horns. The sheep seen by Colinson belonged to the Panonian tribe and the sheep mentioned by Cornevin (1890) was in Kosovo-Montenegro?

(b).The second supposition is done and accepted by some Hungarian scientists. In the formulation of Dunka (1984), who used Brummel (1900) and Hanko's ideas (1937), cited by Bokonyi, the breed ***"entered the Carpathian Basin in the period of the great migrations, arriving either with the Conquerors Hungarians or with other people or tribes"***. As an argument, he mentioned the existence of **a similar Moldavian or Russian breed;** such a breed **does not exist and did**

not existed either in Russia or in Moldavia. Bela Dunka (1984) indicates also that "the breed is primarily indigenous to the Hungarian Plain." Even though it is not attested by Buffon, he could be right. **Cavalli-Sforza** (2001), a great expert in European paleogenesis, suggested the existence in the Pontic steppe "before its conquest and the imposing of the Hungarian language by the Magyar monarchy. It is about a "local Romance-speaking population in this area which was a Roman province". It is possible, but less probable, as the Proto-Romanian population from the ex-Roman-Panonian province to have had the Valahian Corkscrew Horns Sheep Breed, before or at the same time with the Subpanonic Space (Serbia) different from the one of Kosovo.

Kukovics (2005) sustain Dunka's opinions affirming that Racka (White Valahian corkscrew horns breed) would have, according to **the majority of opinions** (p.208), ***an "Asian origin, and arrived in Europe with the Hungarian people in the 9th century " (***p.210). For the Black Racka he accepted however that just "to several opinions arrived to Europe with the Hungarian people in the 9th century"(p 208). Perhaps the last affirmation is true. It si also attested the name of the breed supported by the Hungarian authorities in 1996 on the "Racka" bred box at an animal exhibition in Utrech, the Netherlands, ***"Racka ou Valache***"(Photo).

The thesis regarding the bringing of this breed in the 9th century has probable **subjective explanations.** According to Dunka, this bred disappeared in Transilvania in the 13th century when the Romanians who came from the Balkans brought the Ţsurcana and Ţsigaia breeds!!. In fact, the Valahian Corkscrew Horns breed does not resist in the mountain area in Transilvania. In 1970, a breeder tried to intorudce this breed in Bistrita area and his intention colapsed. Objectively, it is more interesting a deduction from the paleogenetic true, demostrated by Sforza-2001, that Hungarians are genetically just some 10 percent Magyars, and a great proportion of their genes are…brothers with the assimilated Romanians, ex-owners of the sheep from Panonia. The problem has one more complication. Baltay (1994) showed that up to 17-th century the Valahian Corkscrew Horns breed was more important in Hungary, which is an argument of its old presence. The great Hungarian archeologist mentioned that its bones appeared just in the 17th century.

Subjective approaches of the name. In the South Eastern Europe, during the last decades, it has been and still exist a trend to change the name of breeds for political reasons or by accident. F instance, FAO published a paper where the globe breeds were inventoried in 2000 (FAO, WWL III). According to FAO material, the "Serbian" breed, recently and officialy named "Vlaska vitoroga" in Serbia, (Stojanovic 2003), was called "**Zackel vitoroga"**. ***And this is not the only subjective change of name that we noticed***. In Greece, it is avoided to call this breed "Vlahico". In Poland, it is used the term of "Valahian Breed..Polish of Mountain". Therefore, a scientific zootechnical taxonomy is compulsory, as the zoologists made. This would have not onpy scientific favorable effects, but also socil and historical effects. In addition, we mention Hasdeu's remark (1873): "Serbians like Hungarians learnt pastorship from Romanians" and may b not only them.

(I.2.)Classification of the Valahian Corkscrew Horns Breed. The present considerations also suggest the philogenetic classification presented below for the Valahian Corkscrew Horns Breed.

Classification errors. the Valahian Corkscrew Horns Breeds have been and are still eroneously included in philetic Zackel group. Tis classification includes two errors as follows: (1). No breed from Zachel group is named Zackel. These breeds are descendant from the Traco-Geto-Dacians' sheep 1,000 years B.Ch. brought by them from Mesopotamia and are or were named "Valahian breeds". This is the corrcet name of the sheep group (Drăgănescu, 1994). Only Tsurcana breed bears a name of Sanskrit origin, meaning "sheep and goat"; (2). Valahian Corkscrew Horns Breed has no

philogenetic links with the Valahian Breeds; **in fact, it sis the only breed** which deserve the name Zackel, meanning "sharp horns", the translation into German of the Latin- "strepsiceros" name.

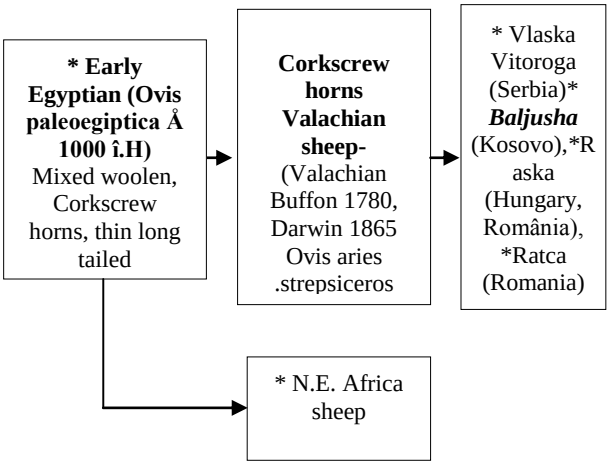

Fig.1. Cladograma of the Valahian Corkscrew Horns Breed (Drăgănescu,1998, Reader, 1968)

Classification errors. the Valahian Corkscrew Horns Breeds have been and are still eroneously included in philetic Zackel group. Tis classification includes two errors as follows: (1). No breed from Zachel group is named Zackel. These breeds are descendant from the Traco-Geto-Dacians' sheep 1,000 years B.Ch. brought by them from Mesopotamia and are or were named "Valahian breeds". This is the corrcet name of the sheep group (Drăgănescu, 1994). Only Tsurcana breed bears a name of Sanskrit origin, meaning "sheep and goat"; (2). Valahian Corkscrew Horns Breed has no philogenetic links with the Valahian Breeds; **in fact, it sis the only breed** which deserve the name Zackel, meanning "sharp horns", the translation into German of the Latin- "strepsiceros" name.

The explanation of this error is the following one. Nathusius (1880) made a history of identification and breed denomination. He translated in German the name given by Linnaeus to the breed O. a. strepticeros and called it Zackel, because probable this term looked to be more scientific than the term of Valahian given by Buffon. The Nathusius (1880) innovation favored a major error: the denomination of all breeds named Valachian (Valakhskaia, Valassky, Zoslachtena Valaska, Walachenschaf, Vlahikos, etc.)were included by the German experts in Zackel group. The error could be induced by the fact that the term Zackel signified "mountain peasant" from Romania, respectively "Vlah" (German-Transilvanian Saxon Dictionary). The error goes on. A Ţsurcana breed (Valahian) "GhimesŢsurcana" is called "Gymes Racka" in Hungary, therefore its is obviously "Racka", can not live (be raised) in the Gymeş Mountains. The error is justified by the fact that the Valahian sheep have mixed wold like the Valahian Corkscrew Horns Breed. The scientits did not remarked that it is not about the same breedm because "wool structure" is different.

II.Location and breed size

In **Romania,** the breed was raised, as we noticedin 1997, in 4 villages (Biniş, Comorâşte, Forotic, Doclin) in Caraş-Severin County, Banat-Dognecea region, (20-50 km from the borders with Serbia). That time, there were 209 ewes and 18 rams of pure sure origin, raised in 22 subzistence households. In other 35 farms, there were 671 ewes and 28 rams but not of pure origin. In 1999, there were regieterd 2,058 sheep in the whole area. Based on these data, Vicovan (2006) estimated that the effective breed size is 160.1 heads, meaning a critical situation of this breed in danger to disappear. In 1990s, it was made an export of animals in Hungary in order to support the conservation nuclues.

In **Hungary**, the breed is well conserved and selected, It was studied and presented the firts time by (Bodo 1996). In 2002-2003, the production stock had 1,300 black and 10,000 white sheep. In 2005, the registered livestock counted 2,400 white sheep in 30 farms and 1,450 black sheep in 35 farms. The production system was a traditional extensive one. The production characters were prolificacy 1,1-1,2, weight gain 220-240 g/day/ewe and 250-300 g/day/ram; at one year age, body weight was 30-34 kg/ewe and 42-46 kg/ram raised in an extensive traditional system of eco-farm. Wool production was 2-3 kg having a fineness of 24-32 microns, respectively 50-60

microns and 14-27 cm length.

In **Serbia,** the breed is in a critical situation. In 2003, the stock counted about 50 sheep (47 ewes, 3 rams) located in the Northern Serbia, Voivodina, especially in the Vârşeţ area. The ram body weight was 40 kg and the one of ewes 35 kg/head. Baliusa Breed grown in the South-West Serbia, in Kosovo and Metohia, representing about 3-4 % of the local sheep. The breed is in decline being in a critical situation. The rams have 65 kg and ewes 55 kg. They are white sheep, but their head is black (Stojanovic, 2003).

III. Some morpho-productive characteristics of the Valachian Corkscrew Horns Breed

As now the breed is erroneously and frequently included in the Valachian sheep philetic group, descendant from the Tracic sheep and erronated called "Zackel", it is important to point out the characters which determine this confusion and the ones which attest the economic and genetic differences between them. At a superficial observation, it seems that the only major difference between the Tsurcana breed (Valachian, erronated named Zackel) amd the Valahian Corkscrew Horns Breed is the horns shape. In reality, the differences are many and much more complicated.

Table 1. Procentage of different fibres for the Valchian Corckscrew Horns Sheep Breed and Tsurcana Breed (Stefănescu *et. al.*,1958)

Breed	Type of fibres		
	Fine (18-30 microns)	Medium (30-45 microns)	Thick (45 microns)
Valachian Corkscrew Horns Sheep Breed	34.95	40.68	24.37
Tsurcana Sheep Breed	55.0.2	24.36	16.62

The Valachian Corkscrew Horns Sheep is **a sedentary sheep, not adapted to transhumance**, even not to the simple movement (plain meadows to alpine meadows). It is not adapted to live in flocks and also **does not support wintering in open field (wintering lasts about 30-60 days) and even rains (**when it is rains, the sheep are looking for a shelter), while Tsurcana breed avoid staying in sheds.One of explanation of this difference is the smaller weight of fine fibers in the Corkscrew Horns sheep compared to the thick fibers characterizing Tsurcana breed. This could justify its low adaptation to cold and rain (Tabel 1).

The Valachian Breed is used for milk, meat and wool production. There are not too many comparative research results for these characters for the two breeds. Saurer (1999) foaund that the live weight of the Valachian Corkscrew Horn Sheep is 50.15 kg (Caransebes Tsurcana, 46.43 kg not significant difference), wool production 1.44 kg (Tsurcana 2.45 kg), washed wool proportion 75% (Tsurcana 68.2%), milk fat 6.4% (Tsurcana 7.2%), milk protein 6.15% (Tsurcana 5.75%), wool length 28.2 cm (Tsurcana 26.4 cm), average wool finesse 38.11 microns (Tsurcana 40.5 microns). Some data are confirmed by some earlier researches (Table 2, Stefănescu, 1956).

Many of morphological research results are missing for the Valachian Corkscrew Horns Sheep Breed in Romania compared to the one from Hungary, Serbia and Tsurcana. Regarding colour, *the Valachian Corkscrew Horns Sheep Breed is recesive against white, the reverse like at Tsurcana breed.* **It seems that** regarding the body development and conformation, the Valachian Corkscrew Horns Sheep Breed from Hungary (prezented by Bodo) is more uniform and of higher quality due to a systematic selection. This aspect is simply demonstrated by *horn position*.The Hungarian breed has unifom horns in V shape, while te breed from Romania has the horns oriented straight lateral.

In Hungary, the color is more uniform (white wool on face and reddish legs; black wool, face and legs). More detailes about the morpho-productive characters of the Hunagrian breed are presented in Kukovics questionnaires **(2005).**

IV.Production systems, genetic management

Most of the Valachian Corckscrew Horns Sheep from Romania belong to the subsistence farms having about 1-20 sheep. The sheep are pastured around the village, the owners being associated and organize flocks of about 100 sheep, the shepard being employed. The sheep are brought home in the evening, where they milked in the evening and also in the morning by every owner. In general, each sheep breader uses to have his own rams and reproduction is done within the community, the breaders exchanging rams between them in order to avoid consanguinisation. The are also some elite farms where rams are assured from in the own farm practicing a certain consanguinisation.

Table 2. Wool and milk production for the Valchian Corckscrew Horns Sheep Breed and Tsurcana Breed (Stefănescu *et. al*.,1958)

Breed	Wool production(kg)			Milk production(kg)				Lactation (days)	
	No.	Average (kg)	Limits (kg)	No.	Average	Limits	% fat	Average	Limits
Valachian Corkscrew Horns Sheep Breed	20	1.8	1.5- 3.9	22	134.13	23.84-269.29	7.05 (5.9-8.2)	161.12	138-177
Tsurcana Sheep Breed	216	2.06	1.2-4	-	-	-	-	-	-

Photo 2. A ram of the Valachian Corckscrew Horns Breed, the sheepbreeder and research team in Dogneciu area, Banat region.

Breed conservation.

After the forced cooperativization in the period 1950-1964, Tsurcana breed was introduced in the cooperative farms of the Valachian Corckscrew Horns Breed. The owners noticed that the Tsurcana has some advantages compared to the Valachian Corckscrew Horns Breed and decided to replace the breed. As a result, the livestock of the Valchian Corckscrew Horns Breed declined and continue to do this. **It entered in a critical period being in danger to disappear,** probable in Serbia. According to tradition, some peasants, especially the old ones, still conserve it, but this is not a solution. ***The genetic need to preserve this breed and in addition cultural and social heritage linked to its raising impose the setting up and implementation of a scientific programme for its preservation and this has to be done by the public authorities.*** Besides the breeders organization by technical and economic cooperation, the breed has to be conserve in national ecological parks. The Hungarian experience is a good example and should be urgently considered.

CONCLUSIONS

Valachian Corkscrew Horns sheep is a breed from the Early Egyptian (Ovis paleoegiptica) philetic group, named by Buffon (1780), Darwin (1865) Valachian, by Serbs Corkscrew Horns Valachian (Valaska vitoroga), by Hungarian Racka (Serbian), by Linnaeus O.a.strpsiceros. It is located in Serbia, Montenegro, Panonia, and Romanian border with Serbia.

It is a document of the former existence of a Valachian tribe in this area, implicitly it attests the Valachian contribution to the ethnogenesis of other nations in this area.

A breed with similar horns, but just in rams, it is a possible document for a former existence of a different Valachian tribe in Kosovo.

It must be avoided the confusion between the Valahian Corckscrew Horns breed and the Valachian ("Tsurcana") breed, erroneously named Zackel, orginated from old Thraco-Geto-Dacian sheep breed.

The Valachian Corkscrew Horns Sheep Breed is a sedentary sheep, not adapted to transhumance and to big flocks, not adapted to support wintering in open field, even to stay in the rain. It has a smaller weight of fine fibbers in the mixed wool, it seems that its black colour is a recessive one, the inverse than in Valachian (Tsurcana) breeds.

This breed is economically not competitive with other local and improved breeds and it is in danger of extinction in Serbia and even in Romania, while in Hungary it is well conserved.

As an interesting genetic resource, but also for the aesthetic aspect of his horns and for some cultural reasons, it deserves to have a good genetic conservation program.

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ANALYSIS OF AGROTOURISTIC INFRASTRUCTURE – CASE OF SOUTH-WEST OLTENIA REGION

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Abstract

For Romania, the country that has rich and diverse natural and human resources, tourism is one of the priority sectors. This paper proposes to analyze Romania's tourism infrastructure at the end of 2011, Romania's tourism structures was represented by 8438 units. By region, South East concentrates the largest number of pensions, and the opposite being the Bucharest-Ilfov where pensions segment is in an early stage, in position 7 topping the South West region with 547 accommodation units representing only 6.5% of the national total, with a total of 286 hostels tourists of which only seven agro touristic pensions.

Key words**:** *agro tourism, agro touristic pensions, infrastructure, South-West Oltenia, tourism*

INTRODUCTION

Over time, Dracula was the most important tourism product exported, together with the Romanian seaside and monasteries in northern Moldavia.
Today, Romania is trying to make known the wisdom of the Romanian village fascinating discovery by past and present.
According to law 151/1998 in Romania were created 8 regions, which is "the design, implementation and evaluation of regional development policy, and collection of specific statistical data in accordance with European regulations issued by EUROSTAT for the second NUTS 2 territorial classification existing in the EU."
In Romania there are 2838 common, with about 13,000 villages and rural population represents about 45.1% of the Romanian population, rural areas representing 90% of the country, most of the economic resources being here: agricultural resources, tourism, spas, industrial raw materials, etc.
Romanian Village Organization (OVR) under the auspices of Phare, developed in 1997 a "Program of development of agro villages 'core group is represented by the" local tourism development', addressing the core basic tourist villages in organizing and promoting rural tourism and agro tourism. (Photo 1).

Photo: Romania Regions by tourism potential

Firstly, tourism potential is composed of a variety of landforms, mineral water and thermal springs, lakes used for recreation, swimming and fishing, hunting a valuable concentrated in deciduous and coniferous diverse landscapes from that of mountain ridges developed over 2000 m in the lowland coastal and Delta. The history of our people is reflected in many materials and spiritual that can be seen especially in places like

museums, monuments, churches, monasteries, ancient castles and medieval costumes, fabrics, ceramics, etc. They are levels of modernization, paths and forest roads in the mountains that are markers of interest, a network of hotels, villas, bungalows, cottages, village houses and so on, diverse in size and equipment level, multiple possibilities of obtaining food and services, etc..) but with an unequal distribution is concentrated in the major cities along the coast so important tourist arteries.

Thus Romania differ in several provinces with distinct data elements the combination of natural and man-made infrastructure accordingly different values or existing items.

One of the eight regions of developers, named after their geographical location in the country, is the South West region consists of 5 counties,

Dolj, Gorj, Vâlcea, Mehedinti and Olt, based in Craiova, the largest city in the municipality of Region with structured settlements, in 2010, in 40 cities and towns (including 11 cities and 29 towns), 408 communes and 2070 villages.

History of Oltenia County with his fabulous and wondrous earth "spoiled the gods", is part of the South West Development Region, the region "first dry continental geological regions about the Romanian Carpathians kept the ethnicity and dialect clean ... ". And according to the same author, Popescu-Voiteşti, "... it is the region in which Romanian specificity in port, faith and culture, appears in the cleanest and characteristic shape."

This region whose name comes from no less legendary Alutus the old Olt, who Bogza Geo

wrote that "a song never stopped a huge song, echoed grows, develops and flows over the sides" has a dominant feature 'meeting here, the Mount of the Danube, the two axes that conditioned the time history of the native element apart from the Carpathians ". It is called often and Development Region South West because it is made at a rate of 82.4% in valuable background elements that focus the attention of many visitors. Add a diverse infrastructure (road network with different the former historic regions, Oltenia old Romanian province, located in the south - west of the country, north of the Danube and the Carpathians and who, in terms of relief, climate, water, soil and its natural boundaries (Danube Carpathians, Olt) is a well-defined natural unity between the meridians of 22 ° 2 'and 24 ° 2' and parallels 43 ° 3 'and 45 ° 3', covering 29,212 km2, or 12.25% of Romania, and with a population of 2,330,792 inhabitants at a density of 79.8 inh./km^2.

Oldest archaeological this region revealed the traces of "the culture of rubble" (Dârjovului valley near the River,) showing human presence after more than 500 thousand years ago, that making this earth discoveries of Oltenia "a sort of primordial cradle" of man in Europe. Just to note that, in the year 168 AD, Oltenia, as the Dacia Inferioris Malvensis, was one of the most flourishing provinces of the Roman Empire.

All these "bad mouths" do not forget that his first law book written in Romanian language, Code of Laws of Govora, and everything from here, on this land, the ban of Craiova, Great Prince Michael the Brave, the 1600 went to his great courage to fulfill a dream of becoming "Unificator" and "founder" of the first Romanian state, created by the union of the three Romanian countries, Transylvania, Moldova and the Romanian Country, who, after having saw his dream come true, delivered the soul at peace, full of words and relief bitterly.

MATERIALS AND METHODS

As a method we will use the comparison analyze of agro touristic infrastructure presented in Romania, by regions of development and counties, in the South-West Oltenia Region, by types of units: hotels, pensions, agro touristic pensions, villas and bungalows, chalets, camping, motel, river boat, floating pontoon, tourist camp, tourist village representing other structures.

RESULTS AND DISCUSSIONS

In Romania, at the end of 2011 there were 8438 units authorized travel, the highest number being owned boarding houses (boarding + agro), approximately 50% of those registered nationally.

At regional level, South East won the first place, recording the highest number of units in 2640, representing 30.9% of those registered at the national level, 1005 pensions of all the hostels, followed by other forms of 986 units per 3rd topping hotels, last position being owned villas, with 468 units.

South West Region is ranked 7 with a total of 547 units authorized travel, which represents only 6.4% of all existing in Romania in 2011. Analyzing the South West region on the types of units, we see that boarding houses have the largest share, with 286 units, representing over 50% of total agro hostels instead of 7 am only. The buildings in the area are in number 131and with pensions are the main forms of accommodation in SW Oltenia.

Last region ranked in Romania is Bucharest-Ilfov region, with a total of 281 units, hotel accounting for nearly 65% of the region, with 188 hotel units. The Bucharest-Ilfov Region has the lowest number of guesthouses, hostels only 29 and agro touristic pensions are missing (Table 1).

Table 1. Structure of units authorized travel by regions and types of units, in 2011

No. crt	Region	UM	Tipes of unit		in which the types of units				
			Total		Hotel	Pension		Villa	Others*
			Units no.	%		Total	witch agrotour		
1	Nord-Est	units no.	948	*11.2*	147	629	32	35	172
2	Sud-Est	units no.	2640	*31.3*	649	1005	37	468	986
3	Sud Muntenia	units no.	886	*10.5*	187	393	6	98	306
4	Sud Vest Oltenia	units no.	547	*6.5*	131	286	7	54	76
5	Vest	units no.	824	*9.8*	188	407	15	58	171
6	Nord-Vest	units no.	909	*10.8*	174	558	97	57	120
7	Centru	units no.	1403	*16.6*	166	953	44	61	223
8	București-Ilfov	units no.	281	*3.3*	182	29		20	50
Total units / country		units no.	8438	*100.0*	1824	4260	238	851	1503
		%	*100.00*	X	*21.02*	*49.10*	*2.74*	*9.81*	17.32

* Bungalows, chalets, camping, motel, river boat, floating pontoon, tourist camp, tourist village

Based on the data given in the table, we see that more than half, 286 units representing 52.3% of the total number of units authorized travel are pensions, but unfortunately for agro phenomenon, only 8 units are agro touristic pensions (7 in Vâlcea county and 1 in Gorj), which we can draw a first conclusion, that in the Oltenia region, rural tourism and agro tourism are not well developed forms, the tourism that after the potential of the area, the least, it should be placed on the other coordinates.

A second conclusion that can be drawn, following data table , and to take into account in any analysis aimed at tourism phenomenon development Region South West, is that 256 pensions (including the eight agro touristic pensions), 83 hotels and 118 villa-style units and other establishments, ie, a total of 465 accommodation units (out of 547 total, region), belonging to North Oltenia , or " Oltenia in the mountains" as it is called this territory, in the foothills, that Vâlcea, Gorj and Mehedinți counties with relief predominantly downhill and enjoying existence or microstate tourist resorts, with some specific features, having areas leisure and recreation. Also worth mentioning is that Vâlcea by far the most developed county in the region, in terms of tourism on the territory of a number of 150 pensions (including agro touristic pensions 7), which adds another 84 villa-style accommodation units or other, and

one of 45 hotels, so the total number of housing units is 279 units, accounting for over 51 % of the total units in the region. Counties plain, Dolj and Olt, does not amount, in total, than a number of 90 accommodation units of which 30 units with specific character board, 12 units (Olt 2, Dolj 10) villa type or other and 48 hotels. In these counties there is a tourism of city, tourists coming to the area are either visitors to museums of different sights and monuments of art, existing mostly in urban perimeters or are casual tourists, who are passing or various tours or are arriving in town for business, meetings, various kinds of congress, festivals and cultural events, sporting or otherwise. Therefore, their accommodation and hotel units focuses on the urban perimeter, especially in the pension or urban.

As a final conclusion, we can say that these figures speak for themselves about the distribution of housing units and intake quite unbalanced in terms of tourism, the counties that make up the Oltenia region.

Table 2. Structure number of units authorized travel counties of the South West Oltenia and drive types in 2011

No. crt	Region	UM	Tipes of unit		in which the types of units				
			Total		Hotel	Pension		Villa	Others*
			Units no.	%		Total	which agrotour		
1	Dolj	nr.unitati	62	*11.3*	34	18		2	8
2	Gorj	nr.unitati	114	*20.8*	19	66	1	7	22
3	Mehedinti	nr.unitati	64	*11.7*	19	40			5
4	Olt	nr.unitati	28	*5.1*	14	12		1	1
5	Valcea	nr.unitati	279	*51.0*	45	150	7	44	40
6	Total unitati Reg Sud Oltenia	nr.unitati	547	*100.0*	131	286	8	54	76
		%	*100.0*	X	*23.9*	*52.3*	*1.5*	*9.9*	*13.9*

* Bungalows, chalets, camping, motel, river boat, floating pontoon, tourist camp, tourist village

CONCLUSIONS

At the end of 2011, in Romania the where only 8438 accommodations, higher concentration being in the South- East Region, with 2640 types of units, the highest number for guest houses (1005 units) was still here and the highest concentration of agro touristic pensions being in the North West, with 97.

Despite the fact that South-West Oltenia Region has a huge agro touristic potential, it is not still not well capitalized, Oltenia need to improve here touristic infrastructure as soon as possible, having only 7 agro touristic pensions, placing the region on the 7-th position, the last position topping Bucharest-Ilfov, which has no agro touristic pensions.

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BREADFRUIT (*Treculia africana*) MARKETING ACTIVITIES AND RETURNS IN AHIAZU MBAISE LOCAL GOVERNMENT AREA, OF IMO STATE, NIGERIA

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Abstract

This study on marketing of breadfruits (Treculia africana) and returns was done in Ahiazu Mbaise local Government area of Imo State, Nigeria. The specific objectives of the study were to describe socio-economic characteristics of respondents (sellers and buyers) of African breadfruit; identify value-chain activities available in processing and its storage in compliance with consumers' order and preferences; determine factors influencing decision to supply African breadfruit; and constraints with its post-harvest management in the study area. Three-stage random sampling technique was used in selecting locations and respondents through which eighty (80) farm households who gather/harvest, process and sell breadfruits were selected and interviewed with structured questionnaire. Data collected were analyzed using descriptive statistics, and probit regression model. Result revealed that 65.80% of the respondents were females and 81.20% of them were married with mean household size of 9 members. Their literacy level was high as 97.6% of them had at least primary education. Predominant marketing activities were fruit gathering/harvesting, processing, storage and packaging, transportation, and sales. Socio-economic factors of gender, household size, income, level of education, years of farming experience and labour significantly influenced supply of breadfruits to consumers with challenges of seasonal scarcity, and tedious methods of processing deterring the enterprise in the area. We recommended provision of credit support to enable fruit gatherers purchase and use shelling machines and good storage facilities to smooth any fluctuations in supplies during off-seasons and help fight overdependence of households on roots and tubers.

Key words**:** *Ahiazu Mbaise, breadfruit, marketing, value chain activities*

INTRODUCTION

Breadfruit is important food tree crop that bear seeds widely eaten in southern Nigeria. It has a potential of providing palatable cooking oil. Literature has revealed that on commercial scale of vegetable oil production breadfruit can yield 10.23% of oil (Ekpenyong, 1980; Okeke, 2005; Nwigbo et al., 2008). The trees bear fruits that vary in size but are generally spherical, large, rough textured, green when juvenile and greenish-yellow when ripe, pulpy and covered with soft, spinous structure (Baiyeri and Mbah, 2006). Gathering of ripe fruits from the wild and harvested ones from orchards of farm households is a common farm activity during heavy fruiting period (February to August) and period of light fruiting (September to January) in parts of southeastern Nigeria (Okafor, 1985). At present, cultivation, gathering and processing of African breadfruit in the area provides a chain of subsistence agricultural activity which still is relatively non-mechanized but provides rural jobs, especially for the women.

Breadfruit is a traditional food; the consumption is culturally accepted and is gradually being changed from food for the poor to food for the affluent in the area and in all Igbo ethnic communities. Okeke et al. (2008) confirmed its choice by the rich and the sick by describing it as an expensive delicacy eaten alone boiled or eaten with other foods, and could be roasted and eaten with palm kernel or coconut as a snack. Further, they saw it as a good source of income with good nutrient value for diabetics. Fassi et al.

(2004) and Nwabueze (2006) also recognized African breadfruit seeds as good snack food, the flour of which is used in thickening soup and baking cakes. Nutritionally, Ejiofor and Okafor (1997) analyzed the food content of African breadfruit and revealed that it contains protein 14.6%, carbohydrate 68.08%, fat and oil 11.3%, with varying percentages of vitamins, crude fibre, mineral salts and water. Gaimi et al. (2000) recognized breadfruit seeds as good supplements to livestock feeds as well as good food for humans.

One personal communication by Nigeria Institute of Horticulture (NIHORT) in 2008, reported the high price fetch by African breadfruit by stating that 3.80 kg of the seed sells for as much as seven hundred and fifty naira (₦750.00) (4.69 US$) 1US$ = ₦ 160. This means that trading on breadfruits can not only provide employment for persons who engage in it but could fetch a reliable income to persons who find it difficult to gain employment in conventional industries. This use of non-timber products to fetch household support employment and income had been emphasized in Nigeria (Adepoju and Salau, 2007; Babalola and Agbeja, 2010). Encouraging fruit tree growers and gatherers, Nzekwe et al. (2010) observed that planting a hectare with 100 stands of breadfruit will fetch an annual income of eight hundred and eleven thousand, three hundred and forty naira(5070.875 US$).

Breadfruit head or bunch are hard and fibrous, weighing about 8.70kg and enclose between 50 and 70 seeds, with trees planted some distance away from residential areas to avert danger posed by the large heavy fruits which traditionally are not harvested but are allowed to ripen and drop from the tree (Mbakwe, 2005). Fallen breadfruit heads are gathered in heaps, allowed to rot/ferment for about seven days and washed with fresh water to extract the unshelled seeds.

Breadfruit marketing activities include all postharvest activities involved in the flow of breadfruits and seeds from the field to consumers through available different marketing channels. These activities according to Burt and Wolfley (2009) include gathering, processing, storage and packaging, transportation, marketing and administration. They all involve use of labour, materials and equipment/implements. The activities are thus associated with its preparation for use and need to be made dynamic. They are crucial value-chain activities needed for securing and protecting rural employment and help in slowing down exodus of rural folk (especially women) from countryside to the towns, which has accelerated in recent decades. Hence, the specific objectives of the study were to:

((i)describe socio-economic characteristics of respondents (sellers and buyers) of African breadfruits;

(ii)identify and explain value-chain activities available in processing and storage of African breadfruits in compliance with consumers' order and preferences;

(iii)estimate annual net income (profit) from breadfruit sales by farmers/gatherers and traders in the study area;

(iv)determine factors influencing decision to supply African breadfruits to traders; and

(v)determine challenges with its gathering, processing and sales in the study area.

MATERIALS AND METHODS

This study was conducted in Ahiazu Mbaise Local Government Area (LGA) of Imo State, Nigeria. Ahiazu Mbaise is made up of two clans-Ahiara and Ekwereazu. The area is at the heart of Imo State bounded by other LGAs: Ehime Mbano in the North, Aboh Mbaise in the South, Obowo in the East, and Ikeduru in the West. Ahiazu lies within latitudes 5°02' N and 7°17'N of the Equator and longitudes 13°10' E and 14°15' E of the Greenwich Meridian. Ahiazu is a densely populated area with a density of over 1,000 persons per square kilometer. Nigeria 2006 population census enumerated Ahiazu Mbaise as the fourth largest LGA in Imo State with a population of 170,902 inhabitants made up of 88,440 males and 82,426 females (NBS, 2006).

The inhabitants are mainly farmers growing food crops such as cassava (*Manihot esculenta*), maize (Zea mays), yam

(*Dioscorea* sp.), plantain (*Musa paradisiaca*), bananas (*Musa sapientum L*), cocoyam (*Colocasia esculenta and Xanthosoma mafafa*), cowpea (Vigna unguiculata), pepper (Capsicum spp), African oil beans (Phaseolus and Vigna spp), yam bean (Psaseolus vulgaris), fruits and vegetables such as orange (Citrus sinensis), guava (Psidium guajava), Cucumber (Cucumis sativus), Pumpkin (Cucurbita spp) . African breadfruit tree grows freely in the many natural and secondary forests of Ahiazu Mbaise where the land use system is predominantly tree-crop alley farming. In some of the secondary forests, the African breadfruit grows naturally with the African Oil bean trees or amidst one major cash crop grown in the area, the oil Palm. Road network in the area is typically rural with some farm households located as far as 15-20 km from the main road leading to Owerri town, the state capital. Breadfruit trees are equally cultivated or the ripped fruits freely gathered for food and for sale by most farm household in the area.

Three-stage random sampling technique and purposive sampling technique were used in selecting location and respondents. The first of the three-stage sampling technique involved selecting randomly four out of the twenty-seven autonomous communities in Ahiazu. The selected communities were Ihitte-aforukwu, Nnarambia, Ogbe, and Umuokirika. Three community markets serving them, namely Afor-Ukwu, Afor Ogbe, and Nkwoala were equally chosen. In the second stage, two villages were randomly selected from each chosen community, giving a total of eight villages. In the third stage, ten farm households were chosen at random from each selected village giving a total of eighty (80) breadfruit farmers/gatherers involved in this study. Purposive sampling method was used in selecting breadfruit traders from the chosen markets in the area. Seven breadfruit traders were thus selected from each of the three selected markets in the area to give a sub-sample of twenty one traders involved in this study. Thus a total of 101 respondents consisting of 80 breadfruit farmers/gatherers and 21 breadfruit traders were involved in this study. Primary data were collected from the respondents using two structured questionnaires, one administered to the chosen farm households and the other to traders who buy and sell breadfruit heads or bunch, shelled and unshelled seeds in the area. Data gathered were analyzed descriptively and inferentially.

Descriptively, data were analyzed using SPSS version 16.0 to compute means, frequency distribution was used in describing socio-economic characteristics of breadfruit farm households/gatherers and traders. The returns from breadfruit enterprise to the households and traders were determined using farm budget analysis. Net marketing income was computed by subtracting marketing costs from gross sold breadfruit value. Computing net income was possible when we estimated the fixed costs incurred in marketing. The fixed marketing costs identified on the side of farmers/fruit gatherers included: depreciation costs on baskets used in washing/filtering, pots used in parboiling seeds, spoons, mats used for seed drying, depreciation charge on marketing stalls, interest on investment capital (average investment, i.e., initial investment plus estimated salvage value divided by 2 x interest rate), and jute bags used for storage and transportation. The variable costs identified included hired labour charges for gathering/harvesting breadfruits, hired labour charges for fruits processing, cost of firewood used, interest on operating capital (one third of variable costs x interest rate), transportation expenses, cost of packaging materials, and cost of repairs of machines/implements. Mathematically, the Net Farm Income (NFI) was determined with:

$NFI = \sum P_i Y_i - \sum P_{xi} X_j - \sum Z_k \ldots$ (1)

where:

NFI = Net Farm income for African breadfruit marketing;

Y_i = Quantity of breadfruit gathered/harvested by ith farmer in a year (tons) i = 1, 2, 3…n;

P_i = Price per ton of breadfruit gathered/harvested (US$ …..;₦'000);

X_j = Quantity of jth variable cost item incurred in marketing breadfruit (j= 1, 2, 3, …m);

P_{xi} = Unit price of the jth variable cost item (US$ ….=Naira);
Z_k = The cost of k^{th} fixed cost item in marketing of breadfruit (k = 1, 2, 3,...,k);
$\sum$ = Summation sign.

The depreciation cost of all fixed marketing items was determined following straight line method with assumed scrap value of zero naira after three years. Thus:

$$\text{Annual depreciation} = \frac{\text{Current Value of breadfruit Marketing Fixed cost item}}{\text{Expected lifespan of breadfruit Marketing fixed cost item}} \quad \ldots(2)$$

The probit regression model was used because decision to supply breadfruits varied from one household to another and among exposable factors suggesting gathering/harvesting breadfruits in excess of household consumption needs with some level of chance or probability. To determine factors that influenced decision of households to supply breadfruits to buyers, a probit model was considered most appropriate. This model was stated as follows:

$$Y_{ij} = \alpha_j + \beta_j \sum_{k=1}^{s} H_{ijs} + \varepsilon_{ij} \quad \ldots(3)$$

wherethe H_{ijs} are vectors of s explanatory variables of the j^{th} household supplying breadfruit; Y_{ij} is a vector of binary variables such that Y_{ij}=1 if the j^{th} household brings breadfruits in excess of her needs for sale, and 0 otherwise. Since Y_{ij}can only assume two different values for the decision yes or no, represented by 1 or 0, the expected probability can be defined as follows:

$$E(Y_{ij}) = E\left[\alpha_j + \beta j \sum_{k=1}^{s} H_{ijs} + \varepsilon_{ij}\right]$$

$$= \alpha_j + \beta_j \sum_{k=1}^{s} H_{ij} E(H_{ij}) \quad \ldots(4)$$

Equation (4) defines the proportion of households with characteristics (H_{ij}) likely to supply processed breadfruits for buyers to buy. The empirical model was specified thus:

$$EXP\ Y_{ij} = \beta_0 + \beta_1 \ln(AG_{ij}) + \beta 2 \ln(GN_{ij}) + \beta 3 \ln(MS_{ij}) + \beta 4 \ln(HS_{ij}) + \beta 5 \ln(ED_{ij}) + \beta 6 \ln(HL_{ij}) + \beta 7 \ln(IC_{ij}) + \beta 8 \ln(ME_{ij}) + \beta 9 \ln(EP_{ij}) + \varepsilon_{ij} \quad \ldots (5)$$

Where variables are as defined in Table 1. The dependent variable is household's decision to supply breadfruit to buyers as defined in equation (1). The explanatory variables were both the continuous and binary types. It was hypothesized that household's supplying breadfruit would positively be affected by: MSij; HLij; ICij; MEij; and EPij; but would negatively be affected by: HSij; EDij; AGij; and GNij.

Table 1. Description of Probit Analyzed Variables

Variable	Type	Description
EXP Yij	Binary	1 if the jth household processed and sales breadfruit; 0 otherwise
AGij	Continuous	Continuous: Age of household head (years);
GNij	Binary	Gender of household head (Male=1; Female=0);
MSij	Binary	1 if head of household is married; 0 otherwise;
HSij	Continuous	Household size (number of persons living and feeding from same pot);
EDij	Continuous	Number of years of formal education;
HLij	Binary	1 if the household processes breadfruit with hired labour; 0 otherwise;
ICij	Continuous	Monthly household income (₦'000);
MEij	Continuous	Monthly household Consumption Expenditure (₦'000);
Epij	Continuous	Years of farming experience.

RESULTS AND DISCUSSIONS

The socioeconomic characteristics of sampled 80 breadfruit gathering/processing households in Mbaise Imo State are as summarized in Table 2. The Table revealed that majority of the breadfruit processing and selling farm

households (90.0%) were aged between 30 and 60 years, suggesting that breadfruit processing and selling was an enterprise that demanded commitment in management which was provided mainly by able-bodied individuals within the workforce age bracket. Relatively few young adults (7.5%) were engaged in breadfruit gathering/farming and processing with still fewer elders (2.5%) managing their retirement from active workforce remaining in the enterprise.

Table 2. Socioeconomics of breadfruit gatherers/farmers and traders in AhiazuMbaise, Nigeria. 2012.

Breadfruit Gatherers/Farmers (n=80)					Breadfruit Traders (n=21)		
Variable	Number	Mean of continuous variable.	Percent (%)		Number	Mean of continuous variable.	Percent (%)
Age (yrs)							
< 30	6	19.0	7.5		3	17.8	14.3
30–60	72	51.0	90.0		14	49.2	66.7
> 60	2	62.1	2.5		4	63.1	19.0
Gender							
Male	27		33.7		2		9.5
Female	53		66.3		19		90.5
Marital Status							
Single	15		18.8		1		4.8
Married	65		51.2		20		95.2
Household Size (Number)							
1– 5	71	4.6	88.8		12	4.1	57.1
6– 10	7	8.2	8.8		7	7.3	33.3
>10	2	16.0	2.5		2	13.0	9.5
Education level							
No formal Educ	2		2.5		2		9.5
Primary Educ.	9		11.3		11		52.4
Secondary Educ	39		48.8		8		38.1
Tertiary Educ.	30		37.5		nil		0.0
Annual labour Used (man days)							
Household only	33	185.0	41.3		21	208.0	100.0
Hired	20	210.5	25.0		nil		nil
Household/Hired	27	177.1	33.8		nil		nil

Source: Field Survey, 2013

There was twice the proportion of males as there were females in breadfruit gathering and processing enterprise in the study area.
Dominance of women (66.3%) as against 33.7% males, suggests that harvesting and/or gathering and processing of African breadfruit are time consuming activities that require expertise, skill and innate physical exertion of carefully selected force (Nwigbo, 2008). Mostly married individuals (51.2%) were involved in the enterprise using labour provided from within their households and/or hired from outside. A large proportion of the households (88.8%) had at most five members which could be adjudged moderate and may justify decisions to hire labour to augment

household labour in processing of breadfruits. An estimate of hired labour is vital in making reliable budget for financial returns. Table 2 further revealed that 41.3% of the farm households provided an average of 185 man days used in breadfruit gathering and processing activities, with 25.0% and 38.8% of farm households using hired labour and household/hired labour using up 210.5 and 177.7 man days respectively for these purpose annually in Mbaise, Imo state. Their literacy level was quite good as 96.6% of the heads of breadfruit farmers/gatherers households/decision makers had at least primary education. These indices have implications in farm decision-making in use of resources, supply of products and technology adoption (Obibuaku, 1983; Ojoko, 2001; and Olaitan, 1984). The breadfruit traders who buy and sell this product in the local markets were both young and aged, mainly females (90.5%), who are married (95.2%), with high proportion (90.5%) having at least primary education. In buying and selling the breadfruits, they all (100.0%) made use of household labour.

Value-chain activities available in processing and storage of African breadfruits

Many products from micro and small enterprises, including those of self-employed small-scale farmers are strengthened by improving the range of activities that bring their products or service from points of conception to their end users. Gathering of breadfruits, its processing, storage, transportation, and marketing help to add value at each stage of these marketing activities. These activities are shown in Fig. 1.

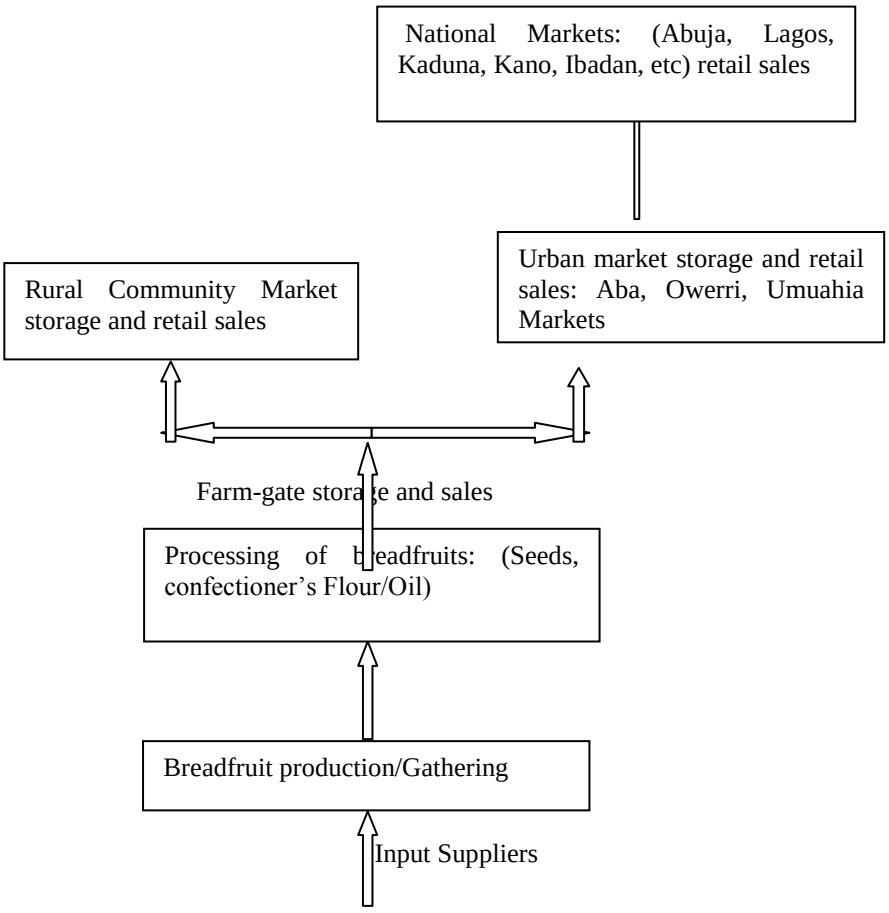

Fig. 1. Breadfruit supply flow and value-adding activities in Mbaise, Nigeria.

Breadfruit processing involves placing harvested or agro-forest gathered breadfruits in heaps for 2-3 weeks until they ferment so well to allow for extraction of the seeds as

described by Baiyeri and Mbah (2006). The extracted seeds are sun-dried for 2 hours and packed off in airy baskets until they are ready for farm-gate sales. Farm-gate and other sales in the various markets are done with disused paint small plastic buckets which when full accommodates 3.8kg weight of unshelled seeds. Each of such buckets full of unshelled breadfruits sold for between ₦700.0and ₦900.0 (4.38 and 5.63US$)amongst the farmers. The unshelled seeds could be roasted and/or shelled for consumers who need breadfruits eaten with cracked palm kernels as snacks or parboiled, and dried for further processing. By traditional method, the dried unshelled seeds are carefully and repeatedly rolled over with smooth empty beer bottle to scratch the brown coloured breadfruit seed coats.

Table 3. Summary of annual marketed quantities, costs and returns from breadfruit seeds in Ahiazu Mbaise, Nigeria. 2012.

S/N	Description	Farmers/Gatherers (Sellers) (n=80) Total		Traders (Buyers)(n=21) Total	
1.	Quantity of breadfruit seed processed/purchased (Tons)	48.4		51.5	
2.	Average Sales price per ton (₦)	236,842.1		315,789.5	
3.	Minimum Sales price per ton (₦)	236,500.0		315,789.5	
	Variable Costs(VC) (₦)		**Percentage of Cost**		**Percentage of Cost**
4.	Hired fruit Gathering labour	264,123.0	35.8	Nil	0.0
5.	Transportation	86,216.4	11.7	215,211.2	63.4
6.	Hired fruit Processing labour	256,274.3	34.7	Nil	0.0
7.	Firewood	50,427.5	6.8	Nil	0.0
8.	Seed Packaging materials	23,167.2	3.1	89,321.5	26.3
9.	Maintenance/Repairs	20,564.0	2.8	17,468.2	5.2
10.	Interest on Operating Capital §	37,374.5	5.1	17,173.4	5.1
11.	**Total Variable Costs (TVC)**	**738,146.9**	**100.0**	**339,174.3**	**100.0**
	Fixed Costs (FC) (₦) Depreciated over three years				
12.	Wheel barrows	150,000.0	20.8	105,000.0	20.7
13.	Baskets	30,135.5	4.2	73,294.3	14.5
14.	Basins	90,213.4	12.5	48,324.2	9.5
15.	Jute/Polythene bags/storage	42,162.2	5.8	98,352.7	19.4
16.	Mats	28,341.1	3.9	12,143.3	2.4
17.	Shelling Machines/Implements	111,500.5	15.4	Nil	0.0
18.	Boiling pots	82,247.4	11.4	Nil	0.0
19.	Steering/sieving Spoons	25,211.3	3.5	Nil	0.0
20.	Marketing Stalls	120,356.7	16.7	139,453.6	27.6
21	Interest on Investment Capital §	42,413.4	5.8	29,725.4	5.9
22.	**Total Fixed Costs (TFC)**	**722,581.5**	**100.0**	**506,293.5**	**100.0**
23.	**Total Costs: (TFC) + (TVC)**	**1,460,728.4**		**845,467.8**	
24.	Revenue (₦) (1)x(2)	11,463,157.0		16,263,159.0	
25.	Gross margin (24) – (11)	10,725,011.0		15,923,984.7	
26.	Mean Gross margin (25)/n	134,062.6		758,284.9	
27.	Net Return (Profit) (25) – (22)	10,002,429.5		15,417,691.2	
28.	Mean Net Profit (27)/n	125,030.4		734,175.8	
29.	Producers' Surplus (2) –(3)	342.1			
30.	Return Per Naira invested in Bredfruit Marketing (27)/(23)	6.8		18.2	

§ Mean interest rate for agriculture and petty trading loans =16.0%; 1.0 US$ = 160.0 NGN, Source: Field Survey, 2013

The so bruised seeds are squeezed to free white seeds from the chaff. Alternatively, a shelling machine with two rollers (one adjustable and the other rotating) is used to bruise the seeds. The freed brown coats of the seeds are pneumatically blown off to leave free the white seeds. The white seeds are now dried further to a moisture content level that prevents growth of molds, thus enabling seeds store for about six months. Storage is done in dry jute/polythene bags at room temperature or in refrigerators.

Estimation of Returns from Breadfruit Sales

Table 3 is a summary of annual costs and returns from breadfruit marketing by sellers and buyers in Ahiazu Mbaise of Nigeria. One disused paint small bucket full (3.8kg equivalent) of shelled clean breadfruit seed sold for between ₦1, 200.0 and ₦1, 400.00 (7.7 and 8.75 US$) depending on the market (farm gate, rural, urban or national market). On the average, each tonne of shelled breadfruit sold for ₦236, 842.1(1480.26 US$) at the farm gate and sold for ₦315, 789.5 (1973.68 US$) by traders in the local markets as shown in Table 3.0. The mean annual quantity of breadfruit processed by farmers was 48.4 tons and mean annual breadfruit sold by traders in the local markets was 51.5 tons. Labour hired and used for gathering ripe breadfruits (₦264, 123.0)(1650.8 US$) accounted for 35.8% of the variable cost of the farmers, hired labour used for processing the fruits (₦256, 274.3) (1601.71 US$) accounted for 34.7% of the variable costs and transportation (₦215,211.2) (1345.07 US$)accounted for 63.4% of the variable costs incurred by the traders with seed packaging material accounting for 26.3% of the variable costs incurred by traders of breadfruit and were the most outstanding variable cost items in bread fruit marketing.

The low variable cost items in marketing of breadfruits were maintenance/repair of trading assets (5.2%), interest on operating capital for farmers and traders (5.1% each) as well as packaging materials used by farmers (3.1%). Depreciation of marketing stalls (₦139, 453.6) (871.59 US$) accounted for 27.6% and (₦120, 356.7) (752.23 US$) accounted for 16.7% of the fixed costs items for breadfruit traders and farmers respectively; and wheel barrows (₦150,000.0) (937.50 US$)accounted for 20.8% of the fixed costs to farmers and (₦105,000.0) (656.25 US$)or 20.7% of the fixed cost items to the traders. Another fixed cost item that was high was shelling machines/implements that accounted for ₦111, 500.5 (696.88 US$) or 15.4% of the fixed costs to the farmers. The low fixed cost items to the farmers included interest on investment capital (5.8%), depreciation of Jute/Polythene bags used in storage (5.8%), depreciation of baskets (4.2%), steering/sieving spoons (3.5%) and mats (3.9%) used in drying the seeds. Amongst the traders, items that accounted for the low fixed costs were depreciation of mats (2.4%), interest on investment capital (5.9%) and depreciation of basins (9.5%).

Returns from breadfruit marketing to farmers and traders were quite high and encouraging to the enterprise. The estimated mean annual Gross Margin was ₦134, 062.6 (837.89 US$) to farmers and ₦758, 285.0 (4739.28 US$) to traders. The estimated mean annual net profits were ₦125, 030.4 (781.44 US$) to the farmers and ₦734, 175.8 (4588.60 US$) to the traders. Each naira invested in breadfruit marketing yielded ₦6.80k (0.04 US$) to the farmers and N18.20k (0.11 US$) to the traders in the area. This high return per naira invested suggests that overhead cost in breadfruit marketing was low with traders and consumers displaying preference and willingness to pay for the product (De Groote *et. al.*, 2011). Producers' (Sellers') Surplus or the difference between the price sellers received (₦236, 842.1/ton) (1480.26 US$/ton) for shelled breadfruit and the minimum or lowest price (₦236, 500.0/ton) (1478.13 US$/ton) for which they would have sold the commodity was ₦342.1(2.13 US$) showing it was attractive to produce or gather breadfruits for sale in the area.

Determinants of decision to supply African breadfruit to traders

Supply decisions are made by producers and traders along distributive channel of a

product. The decision to supply or not to supply a product as made by a producer is however, more overriding. Factors influencing decisions to supply breadfruit by farmers/gatherers of breadfruit in Ahiazu Mbaise was estimated with Maximum likelihood probit regression model and estimates shown in Table 4.

The table showed that two factors, level of education attainment and monthly household income most highly and positively determined decision to supply breadfruits in domestic Ahiazu markets of Nigeria.

This means that the highly educated farmers/ breadfruit gatherers earning relatively high monthly farm income took positive decisions of supplying more breadfruits to buyers in domestic Ahiazu markets of Nigeria.

Other important determinants of decisions to supply breadfruit in the study area were gender, hired labour and farming experience. Women farmers gathered, processed and supplied more breadfruits than did the males. They did this with both hired and household labour but those with many years of farming experience that used hired labour took positive decisions and supplied more breadfruits in the local markets.

Table 4. Maximum likelihood of first-stage Probit estimates of factors influencing farmers decision to supply African breadfruit in Ahiazu Mbaise markets, Nigeria. 2012.

Variables	**Coefficient**	**Standard Error**	**t-ratio**
Constant	-2.212**	1.083	-2.042
Age of household head	0.034	0.043	0.788
Gender	3.106**	1.562	1.988
Marital status	-0.06	2.143	-0.028
Household size	2.516*	1.005	2.145
Educational level	6.414***	2.356	2.722
Hired fruit gathering/processing labour	9.123*	2.063	4.422
Monthly household income	5.286***	1.379	3.833
Monthly household consumption expense	-0.040	0.120	-0.333
Years of farming experience	4.048*	3.090	1.310
Likelihood Ratio test	86..4***		-
R-Squared	0.734***		-

Source: Field Survey, 2013. *, **, and *** Significant at alpha levels of 10.0%, 5.0%, and1.0% respectively.

Table 5. Marketers perceived challenges with gathering, processing and sales of African breadfruits in Mbaise, Nigeria. 2012.

Challenge	Breadfruit Gathering (n=80)	Number (%)	Breadfruit Processing (n=80)	Number (%)	Breadfruit Sales (n=101)	Number (%)
Decline in fruit gathering/harvests.	Increase in number of small, poorly seeded fruits	60 (75.0)	Increase in number of poor quality seeds.	63 (78.8)	Large quantities of seeds of low commercial value.	23 (22.7)
High marketing operating cost.	Time consuming, involves collective labour provided by hired and household members	57 (71.3)	Tedious local method and high initial cost of machines.	48 (60.0)	nil	0 (0.0)
Transportation difficulties.	Heavy as head loads except with wheel barrows	32 (40.0)	nil	0 (0.0)	Dilapidated and flooded rural roads	6 (5.9)
Seasonality of Fruiting/ripening.	Ripen fruits are scarce during dry seasons	73 (91.3)	Use large quantities of potable water procured at high cost to wash seeds during the dry season	54 (67.5)	Many unmet consumer demand during the dry season	17 (16.8)

Source: Field Survey, 2013; Figures in parentheses are percentages

Challenges with gathering, processing and sales of African breadfruits

Marketing activities associated with African breadfruits are not quite easy as they are fraught with difficulties and setbacks. These challenges as observed by the respondents are shown in Table 5. The table revealed that stakeholders in breadfruit marketing observed decline in fruit gathering/harvest, high marketing operating cost, difficulties in transportation, and seasonality of fruit yield as obstacles to marketing of breadfruits in the area. With respect to decline in fruit gathering/harvests it was observed that gathered fruits had in their midst many small and poorly seeded fruits. This was confirmed by processing that revealed relatively high proportion of poor quality seeds with low commercial value.

The high marketing operating costs was in terms of labour costs for gathering of fruits as expressed by 71.3% of the gatherers; and drudgery associated with processing ripe fruits expressed by 60.0% of processors and much time spent on these activities doing them with traditional methods. Where machines were used, high initial cost of procuring the machines was a hindrance also. Marketing challenges expressed by 40.0% of fruit gatherers as transportation difficulties are the weights of ripe breadfruits that constituted heavy head loads when lifted manually except with use of wheel barrows. There was also dilapidated rural roads that made it difficult to transport processed breadfruits to the local markets as observed 5.9% of the stakeholders in marketing of breadfruits. The ripe breadfruits were scarce during the dry season as noted by 73.0% of the gatherers and for the ones available, the processors (67.5%) complained of using large volume of potable water procured at high cost for washing off the slimy endocarps of the fruits. During the dry season, the supply of marketable seeds is small such that 16.8% of the traders in the local markets complained of not meeting much of their customers demand.

CONCLUSIONS

This study concluded as follows:

-There were high returns from breadfruit marketing enterprises in the area. Breadfruit gatherers/farmers, processors and traders had positive surpluses, Gross margin, and net profit from sale of processed breadfruits.

-Gathering of breadfruits, its processing, storage, transportation, and marketing help to add value at each stage of these marketing activities.

-Two factors, level of education attainment and monthly household income most highly and positively determined decision to supply breadfruits in domestic Ahiazu markets of Nigeria. This means that the highly educated farmers/breadfruit gatherers earning relatively high monthly farm income took positive decisions of supplying more breadfruits to buyers in domestic Ahiazu markets of Nigeria.

-Other important determinants of decisions to supply breadfruit in the study area were gender, hired labour and farming experience.

-Women farmers gathered, processed and supplied more breadfruits than did the male farmers in Ahiazu area, Nigeria.

-Obstacles to marketing of breadfruits in the area included decline in fruit gathering/harvest, high marketing operating cost, difficulties in transportation, and seasonality of fruit yield.

Policy Implications

Many people living in rural areas of southern Nigeria where African Breadfruit thrives who are poor or unemployed can make enviable living from gathering and processing this fruits for its seeds or further for its flour or its roasted seeds for snacks. This will go a long way to alleviating poverty and relieving hunger in the area. In addition to formal education, housewives taking decisions of family dietary menu should be informally educated by rural sociologists/dieticians on the nutrient composition of traditional foods like African breadfruit to enrich their meals.

Cheap and affordable breadfruit shelling machines should not only be designed but should be commercialized to reach all who

need it to process the seeds. Research into moisture control should be commissioned by horticultural research institutes to recommend best moisture levels in which shelled seeds can be stored to ensure regular supplies of the seeds in the market during the off seasons. We equally recommended provision of credit support to enable fruit gatherers purchase and use shelling machines and good storage facilities to smooth any fluctuations in supplies during off-seasons and help fight overdependence of households on roots and tubers.

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NATURAL RESOURCES – A REAL OR HYPOTHETICAL OBJECT OF ACCOUNTING

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Abstract

Nowadays natural resources have a controversial accounting treatment which is caused, firstly, by neglecting their inherent properties and, secondly, by a free and one-sided interpretation of the legal framework. The definition of natural resources is bad too, which also creates additional difficulties in accounting of the operations connected with the preparation for natural resources usage and exploitation.

***Key words*:** *deposits, forests, natural resources, parcels, subject of bookkeeping*

INTRODUCTION

Natural resources (including land parcels, deposits of useful minerals and forests) play a very important role in establishing new consumption values and ensuring ecological balance in the Republic of Moldova as well as in other countries of the world. From the point of view of the gross domestic product parcels are both the most significant and the most vulnerable type of natural resources. Parcels used for agricultural purposes comprise 59.2% (or approximately 2 million ha) [5] out of the total area of about 3.4 million ha. Forests occupy about 400,000 ha [7]. There are also 153 opencast mines and pits that are exploited [6]. Despite their unquestionable significance for the national economy and society on the whole, methodological aspects of natural resources account are insufficiently developed and focus mostly on some incorrect judgments. Artificial separation of parcels from other natural resources along with their reflection in a synthetically homonymous account [2] proves this fact as well as the highlighting of acquisition operations connected with natural resources as a priority direction of their inclusion in enterprise assets [4]. Therefore the method of natural resources account needs to be revised and mainly based on inevitable properties of these goods and legislation in power.

MATERIALS AND METHODS

Investigations were primarily concentrated on **the Law on natural resources** [1] and **the Plan of bookkeeping accounts of the economical and financial activity of enterprises** [2]. We have also taken into consideration specific properties of natural resources (their origin, controversial usage, prolonged capitalization, etc.), special legal regulations and the accounting experience of these goods at more than 20 enterprises in the Northern developing district. The monographic (descriptive) method was used to generalize facts and formulate conclusions as well as the selective application of observation procedures on the whole and for comparison.

RESULTS AND DISCUSSIONS

Depending on the way we study the notion of natural resources, the latter has many definitions and meanings that do not coincide conceptually (contradict one another) and grossly ignore some unanimously accepted principles or evident things.

Thus, according to the Article 1, **the Law on natural resources** №1102 of February 6, 1997, natural resources are "… subjects, phenomena, natural conditions and other factors useful for both direct and indirect

consumption in the past, present and future that are valuable for consumers and contribute to the development of material and spiritual goods". Further we specify that natural resources are used as means of work, sources of energy, raw materials and stuff, as objects of consumption and recreation, etc. Finally, the Appendix 1 of the above mentioned law contains the classification of natural resources which include 5 types of renewable resources. The following components of the environment belong to the renewable resources: land, forests, phreatic and ground water, rivers, lakes, reservoirs, canals, flora and fauna. There are two types of non-renewable resources: the first type is represented by oil, natural and condensed gases and the second one includes useful mineral substances. It should be also mentioned that one of the extremely important renewable natural resources is the air which is over the country's territory. Although the above mentioned appendix does not include this natural resource, its existence and importance explicitly result from Article 21 "*Objects of payment*".

Though, to our mind, the definition of natural resources written above is disputable, contains useless specifications and passes over in silence some fundamental properties of these goods. To be more precise, we should mention the following circumstances:

- First of all, the syntagma "*other factors*" with all adjacent explanations concerning their value, destination and a long period of use by human beings is too vague and depending on the study object or purpose can imply some goods that have no relation to the natural resources (for example, various palaces, castles and other historical buildings; certain pictures, sculptures and other works of art; literary heritage of famous writers and poets; the Panama and Suez Canals; botanical gardens, etc.), though it fully correlates with the requirements of their identification;
- Secondly, natural conditions (of a steppe, forest steppe or the subtropical zone) and the phenomena that take place in the nature (torrential rains, sand or dust storms, droughts, blizzards, hail, floods, alternation of seasons, etc.) cannot be equated with natural resources (i.e. land, forest, water, air, etc. assets). It is rather an interaction result of various types of resources and climate factors influenced by irreversible global changes that occur on our planet because of both objective reasons and as a result of destructive economic activity of the human society;
- Thirdly, all natural resources are limited and there are no real possibilities to extend them. For instance, if the production of consumer commodities is constantly growing in the world, exploited natural resources, on the contrary, either decrease in an absolute progression or it is difficult to get them and they are of poorer quality, or their quantity is being reduced in comparison with the population of our planet and global economy, etc. The example of fresh water is very persuasive here. Though, it is a renewable resource, the nature's capacity to renew water resources is limited. Thus, the global volume of fresh water is about 200 thousand cubic kilometres. At first sight, it may seem this is an enormous reserve and nobody should worry about it. The reality, though, is not so bright. If we take into consideration that the population of our planet is actually about 7 billion people and the number of domestic animals has reached 150 billion, it is evident that the total ecological impact of these factors (increased meat consumption, enlarged capacities of bottled water production, etc.) will become a prime mover of the water crisis in the near future;
- Fourthly, the capacity of natural resources to be used by men or the degree of their usefulness doesn't have an absolute (universal) character and it is influenced by technical and scientific progress, vital necessities of the modern society as well as the substantial importance of some distinct types of resources or their conditions of existence. For example, sand soils that lack available water resources actually have no value for farmers. The same thing happens when deposits of mineral resources cannot be actively exploited in order to identify industrial reserves of useful materials because the state budget or economic agents lack

financing. Moreover, sometimes certain natural resources (for example, water) degenerate rapidly from a favourable factor into a destructive danger that leads to the destruction of fields, decay of residential buildings, loss of domestic animals and even to the death of people. Such unwelcome phenomena periodically occur in the Russian Federation, China, India and other countries of the world. In the Republic of Moldova bad floods of the Dniester and Prut Rivers were registered for the last time in summer 2010;

- Fifthly, as we know, natural resources were called in such a way not because they are found in nature's lap (which is often called "environment"), but, rather, because of their natural origin, that is they are formed and developed without the interference of human beings, as a consequence of some long physical, chemical and biological processes (transformations). For example, water power or recycling plants are also situated in nature's lap (at rivers or near deposits of useful mineral resources), but nobody dares to associate them with natural resources. Thus, we may conclude that if an economic agent establishes some objects for sustainable usage (for example, he or she settles a lake or plants a forest) on the owned or occupied territory which don't substantially differ (as to their external appearance and functionality)from traditional natural resources of the same type (that is, from a lake or forest that is managed by a silvicultural enterprise), then the given objects should be viewed as fixed assets rather than natural resources (that is, as a hydrotehnical construction or a plantation of perennial plants in our case). The above mentioned conclusion is also conditioned by the necessity to follow the principle that the contents prevails over the form. This principle states that any bookkeeping element (including the goods that pretend to be natural resources, but they are actually the result of human activity) must be reflected in records, first of all, in accordance with its real origin and primary economic relations, and after that we should take into consideration legal aspects that have been documentarily improved.

In some cases the classification of natural resources found in article 3-5 of the homonymous law may be useful to correctly organize the records. Thus, as it is mentioned above, natural resources are divided into renewable and non-renewable resources depending on their ability to regenerate during the period that is rational from the economic point of view. As non-renewable resources are mined from exploited deposits, their quantity is reduced every year and there appear ascending problems for future generations, because they can renew on their own. Therefore, mining of the mentioned resources should be strictly accompanied by the improvement of their use efficiency and their gradual substitution with alternative materials that are cheaper and ecological.

Depending on their importance, natural resources are divided into national and local ones. The former are relevant for the entire society, the latter – only for a certain area. Nowadays, according to Appendix 2 of the homonymous law, the absolute majority of natural resources belong to the category of national natural resources, which indirectly means their limited volume and alarming status. Local natural resources comprise groundwater and largely spread solid minerals, such as clay, sand, gravel and limestone in case they are mined only for a single rural area, their annual volume doesn't exceed 500 cubic metres and they are extracted at the depth of no more than 2.5 metres.

Depending on their participation in the economic cycle, natural resources are divided into useful or exploited resources (those that are used in the production process or other types of activity), reserve resources (which will be used in the economic activity in the nearest future) and protected resources (which will never be used in the economic cycle, because this may lead to the ecological imbalance).

In order to correctly keep records of the operations associated with natural resources, it is important to follow some precautions of the homonymous law, such as:

- national resources are publicly owned by the state;
- local resources are publicly owned by local administrative and territory units;
- the resources that are owned publicly can be only used for a certain period of time (occupation, concession) for an established sum of money. One has no right to sell or gage them;
- natural resources can be owned privately. However, the number of such resources should be limited: it is allowed only in the situations stated by relevant laws with a limited sphere of application.

The problem of natural resources structure is tangentially mentioned in **the Law on the environmental protection** [2]. Thus, article 4, paragraph (1) states that natural resources combine five constitutive elements: the soil, underground, water, flora and fauna, the air over the country's territory. As we see, the given classification of natural resources significantly differs from the classification provided in Appendix 1 of the homonymous law, though legal documents in both cases have been adopted by the Parliament of the Republic of Moldova with an interval of less than 4 years. We consider that the existing difference proves not so much the complexity of the problem (though one should not exclude it either) as the rush in which some laws are adopted, the superficial character of their examination by specialized committees or plenary sessions of the legislative body, etc. However, regardless the causes of the omitted inconsistency, the presence of such gaps influences negatively the accounting treatment of this type of assets.

Useful information regarding the structure, particularities and regulation method of the relations connected with the use of some distinct types of natural resources may be found in other niche laws (**Land Code, Forest Code, Underground Code,**etc). The generalization of fundamental principles of the six legal documents mentioned or examined above allows us to state the following:

- natural resources are all the goods and organisms whose appearance and evolution are not connected with people's activity. Therefore, they originally have neither the price nor the entry value;
- in the Republic of Moldova land is the principal and the most valuable natural resource that acts as a basic means of work for agricultural enterprises and an essential source of existence for the rural population;
- each of the other types of natural resources (water, forests, underground, etc.) also plays a special role for the national economy and the maintenance of ecological balance, each of them cannot be replaced with any other, it is exclusively owned by the society and its owners can do nothing but use it;
- the degree natural resources are prepared for being used varies depending on their type, location, beneficiaries' technical equipment, etc. Some natural resources (for example, soil and surface water) can be used as they are; no additional preparation procedures are needed. Other natural resources, on the contrary, cannot be used in their original state (for example, deposits of useful mineral resources). In this case, enterprises have to previously perform certain activities (geological research, construction of access paths, mining, transportation and storage of fertile soil, etc.) and, therefore, suffer significant expenses;
- the objects of long use created by men, that is as a result of economic activity of enterprises or citizens (for example, lakes, botanical gardens, forest belts to protect fields, forests planted on the private property, etc.). These objects do have their authentic price (value of entry) and, as a rule, are considered to be fixed assets.

Thus, we can state to what degree the actual accounting treatment of natural resources correlates with their economic essence, what drawbacks are observed and how they can be liquidated.

So, Paragraph 6 of **the National Accounting Standards 16** [2] specifies that natural resources are a natural part of material assets for a long run which have a certain natural deposit form of oil, gases, stones, wooden material, etc., mined (exploited) during a long period of time. Though, to our mind, this

definition is not good and this can be easily proved with the help of the following arguments:

a) Land parcels were illegally excluded from the structure of natural resources; we speak about the most important and valuable part of natural resources for the Republic of Moldova. The isolation of land parcels in a special (particular) type of real estate with its reflection in a synthetic distinct homonymous account (we are referring to **Account 122 "Parcels"**) has an artificial character; it is absolutely detached from reality and is not based on the professional reasoning. Moreover, the definition of parcels stated in this act of statements is not complete either, because it doesn't specify that these resources (as well as the other resources of the natural origin) are not the result of the human activity;

b) The word "*natural*" is repeated twice in the explanation of the given definition, though this insistence doesn't contribute to the more profound perception of the notion of natural resources. Rather, the abuse of this word only leads to the appearance of some additional uncertainties and confusions, most of all by inexperienced accountants. Therefore, we consider that the first word "*natural*" should be simply excluded, but in the second case the syntagma "*have a natural form*" should be substituted with the syntagma "*doesn't result from the working activity*". We should also take into consideration that when we develop and establish any definition, the corresponding notion (in this case we refer to the notion of natural resources) can never be explained by its own;

c) The enumeration of actual manifestation forms of natural resources is also pointless, because, firstly, we do not meet it in many other adjacent definitions (for example, fixed assets, material assets of long use, etc.), secondly, a part of provided examples is not characteristic to our country (for example, oil and gases) and, thirdly, the assignment of wood to the category of reserves which comprises forests is not correct and it neglects the fact that in reality (also according to **the Forest Code**) domestic forests represent mainly a community of trees and shrubs which are exclusively intended for the environmental protection and no way for the mass forest cutting that is later used for further activities or fire (as, for example, it happens in the Russian Federation, Brazil, Canada and other countries with huge territories of forest plantations). The syntagma "*during a long period of time*" that is used at the end of the definition is also useless. At the beginning of this definition one clearly reads that the given resources are some material assets of long use, and the latter, as it is indicated in the same paragraph 6 of the National Accounting Standards 16, have a service life of more than one year (that is during a long period of time);

d) The word "*mined*", which succeeds examples of nominated reserves in the given definition, makes us think that these reserves may be classified as natural resources only if they are in the process of mining (exploitation). In reality, though (also according to the Law on natural resources), there are reserved natural resources, that is the resources that have been found and evaluated qualitatively and quantitatively during some geologic researches, but they are not included in the economic cycle for a variety of reasons yet. Therefore, it would be more reasonable to add the following syntagma "*or that will be mined*" to the word "*mined*". At the same time one should take into account the fact that the verb "*to mine*" naturally correlates with such nouns as "*oil*", "*stone*", etc. and is no way associated with the noun "*wooden material*". As it is known, wood is not taken from forests in the process of forest management; it is harvested by regeneration, conservation, bush nursing, hygiene cuttings, etc. Therefore, the word "*mined*" from the definition of natural resources should be either substituted with another word (for example, "*exploited*") – with a broader meaning and able to correlate with all provided nouns, or supplied with an alternative verb which will refer to the noun "*wooden material*";

e) The same word "*mined*" from the definition of natural resources is followed by the word "*exploited*" that is written in

brackets. In this case brackets mean that the second word has the meaning similar to the previous words that is the two words are synonymous. It is not so in reality and the mentioned words have different meanings. The verb "*to mine*" in combination with the syntagma "*deposits of oil, gases, stones*" means to get some useful minerals from underground, to take them to the land surface in a mining excavation. While the verb "*to exploit*" has quite a different meaning which lies in the research of discovered deposits, identification of industrial deposits of useful minerals, selection of the best methods to extract them, etc. Besides, if it is necessary, one can perform an experimental limited extraction of underground wealth.

CONCLUSIONS

The actual definition of natural resources provided in Paragraph 6 of the National Accounting Standards 16 does not take into consideration inherent properties of these goods; it is based on the wrong professional reasoning and neglects the actual legal framework. In reality it leads to numerous uncertainties and errors, mitigation of the cognitive value of financial reports.

Forest plantations and aquatic objects established by economic agents on their own land parcels should be considered as fixed assets rather than natural resources, because they are the goods created by men.

Land parcels are the most important and the most valuable part of natural resources in the Republic of Moldova. Therefore, the decision to settle them in a synthetic homonymous account is not effective. They should be registered in some additional open accounts within the asset account **125 "Natural resources"**.

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THE ROMANIAN MILK SECTOR PERFORMANCE COMPARED TO THE EU-27 COUNTRIES IN THE NEW AGRICULTURAL POLICY CONTEXT – NEED TO INCREASE COMPETITIVENESS

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Abstract

Taking into consideration the new Common Agricultural Policy (2014 -2020), for the milk sector, which will have as main component the milk quota removal after 2014, the present paper makes a comparative analysis of the indicators from the milk chain links (agriculture, processing, trade, consumption) from Romania and the EU-27 member states in the period 2009-2012, in order to indicate the performance level and position of Romania position among these European countries, as well as the modalities to narrow the productivity gaps along the Romanian milk chain compared to the European Union, having in view the domestic supply improvement and meeting the consumers' needs.
In this context, an investigation was made by each link in the chain, at the level of milk production, raw milk collection for processing, milk processing, distribution and consumption, in close connection with milk quality and price evolution; certain variants and measures were designed to narrow the productivity and institutional organization gaps of the milk chain in Romania

Key words**:** *cow herds, dairy farm size, quality, milk production, prices*

INTRODUCTION

The milk sector in Romania is characterized by a low integration of players in the chain, the main causes being the following: low attractiveness of association for milk producers, which results in an excessive fragmentation of supply and the diminution of farmers' bargaining power with processors implicitly, lack of market information, mainly in the case of medium and small-sized operators, who often make decisions unknowingly; this situation brings about losses at all levels, with a significant competitiveness loss.
That is why the associative organization forms can be considered competitive structures that encourage milk sector modernization and can improve the marketing of dairy products, by the fact that they make it possible for a large number of small producers to actively and efficiently participate to the economic process, narrowing the productivity gaps along the milk chain between Romania and the remaining EU-27 member states.

MATERIALS AND METHODS

In order to capture the main aspects concerning the national milk market, the following information was used: the national data supplied by the National Institute for Statistics (NIS), through the official publication "Romania's Statistical Yearbook", as well as the database Tempo-online - INS, which were subsequently processed, and the information from MARD, ANSVSA. The aspects regarding the evolution and the quantitative and qualitative modifications on the European and world milk market had as information source the reports and international studies elaborated by the European Commission, the data from FAOSTAT Agriculture and EUROSTAT publications. The information supplied by the previously mentioned institutions has its own advantages, enabling comparisons by different regions and across Romania
The utilized method was the comparative analysis of certain sets of indicators specific to each link in the chain. The set of indicators

used for the analysis of the first link of the chain refers to the following: evolution of dairy cow herds, of their yields, average size of dairy farms. The second stage of the chain is investigated from the perspective of the following indicators: collected milk production out of total production by the processing dairy factories, raw milk quality, raw milk procurement price, number of enterprises in the milk industry, added value per employee in milk industry. The indicators on the trade with dairy products refer to the obtained production and the trade between the EU-27 member states.

RESULTS AND DISCUSSIONS

This section presents the results of the comparative analysis, in the period 2009-2012, of the indicators from the milk chain links (agriculture, processing, trade, consumption) from Romania and the EU-27 member states, based on the presented methodology, as well as of the variants and modalities to narrow the productivity gaps between the Romanian milk chain and that of the other EU countries.

Although Romania is on the tenth position among the EU-27 cow milk producing countries, from the point of view of milk production evolution in the period 2009-2011, it has the strongest decline (-682 thousand tons), being on the last place in the case of this indicator (Figure 1).

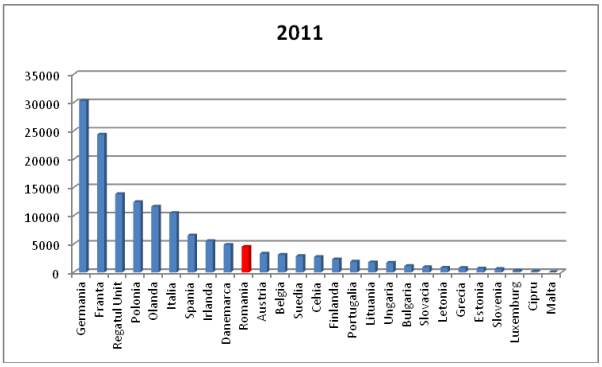

Fig. 1. Total cow milk production in the European Union – thousand tons

As regards the share of milk deliveries in total obtained milk production, in the year 2011, it is mentioned that compared to the European average of 92.3%, the great majority of the European countries deliver milk to processing in percentages ranging from 87 to 100%. Bulgaria (44.3%) and Romania (19.7%) represent an exception. Romania lies on the last position following the analysis of this indicator (Fig.2).

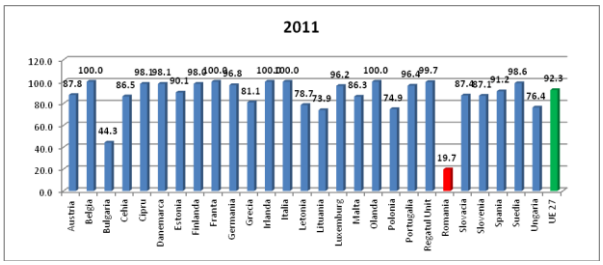

Fig. 2. Share of milk deliveries in total cow milk production in the EU-27 countries, in the year 2011 (%)

The average yield/cow head features great differences across the European countries. (Fig. 3).

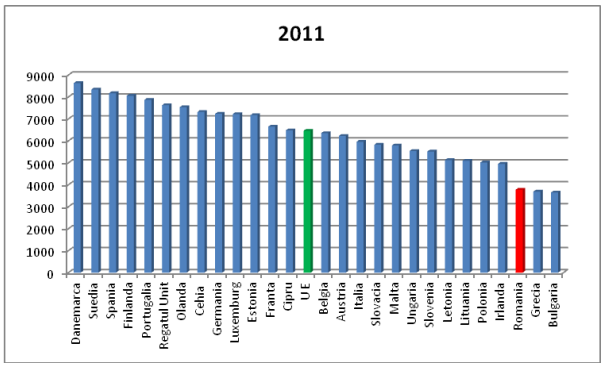

Fig. 3. Average cow milk yield in the European Union-27 (kg/head)

Thus, the highest yields in the year 2011 were found in Denmark (8636 kg/cow head), Sweden (8341 kg/cow head), Spain (8174 kg/cow head) and Finland (8058 kg/cow head). At the opposite pole we can find countries like Bulgaria (3653 kg/cow head), Greece (3691 kg/cow head) and Romania (3776 kg/cow head).

Both the quality and the quantity of milk are affected by the high fragmentation of production, as 59 % of the total cow herds in Romania are found on very small-sized units of 1-2 heads. Thus, out of the 761528 holdings whose average yield was 1.83 heads in 2010, only 20-22% deliver milk to the processing factories. In these conditions, an

adequate selection work and the application of modern technologies are almost impossible. For comparison, the average size of dairy farms in several European countries is the following: Hungary – 22 heads (EUROSTAT 2010), Germany – 40.7 heads (EUROSTAT 2010), Slovakia – 183 heads ("An Assessment of the Competitiveness of the Dairy Food Chain in Slovakia"), Slovenia – 12.5 heads (EUROSTAT 2010).

The cow herds in EU-27 decreased by 0.4% in the period in 2010-2012. This decrease was noticed in most European countries, but the most important decrease was found in Slovakia (30.2%) and Greece (10.4%). A significant increase in the dairy cow herds was found in Slovenia (36.4%), Italy (15.1%), Hungary (5.9%) and Ireland (5.3%), while the number of herds remained relatively constant in the remaining countries (Fig. 4).

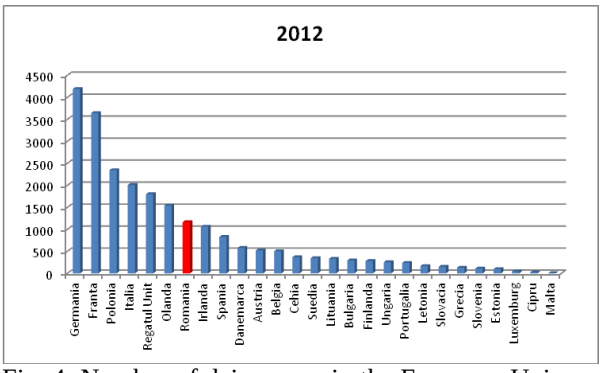

Fig. 4. Number of dairy cows in the European Union – thousand heads

In Romania, raising bovines for milk production is a traditional activity for the rural population, mainly in the mountain area. Although Romania is on the 7th position in Europe as regards the number of dairy cows, the problem is that more than 90% of the so-called "farms" are in fact households with one-two cows that use the obtained milk mainly for self-consumption. Although the number of bovines permanently decreased (the number of cows and heifers inclusively), in the period 2007-2011, the cow herd (cows, buffalo cows and heifers) continued to represent over 60% of total herds. The decreasing trend of the number of dairy cows is both the result of breeders' reorientation towards raising bovines from beef breed, mainly in the less favoured areas, and of the increase of individual production performances.

As regards **raw milk collection** for processing, it can be mentioned that an analysis by the two collection sources revealed the increase of imported raw milk from 3.6% in the year 2007 to 8.2% in 2011, to the detriment of milk collection on the holdings and milk collection centers in the country.

As regards the **raw milk quality**, from the market analysis conducted by ANSVSA, it results that at the end of the year 2011, the percentage of conform milk corresponding to the EU standards, delivered to processing units, was 80%. At the same time, the study also mentions that the conform milk percentage is higher in the case when milk is collected directly from farmers and it is lower when the milk is taken over from a collection center; out of this reason, the prices offered by the processors are different in the case of conform and non-conform milk. From this point of view, the ANSVSA specialists asked for and obtained the approval of the European Commission for the prolongation of the transition period in order to improve raw milk quality until December 31, 2013.

The milk quantity collected in EU-27 in the year 2011 amounted to 138.24 million tons, Germany, with 29.33 million tons (21.2%) being the main milk producer and collector among the EU countries. Germany is also on the top position in the EU with regard to cheese production (24.5 million tons), butter production (0.4 million tons) and skimmed milk powder (0.3 million tons). As regards fresh milk production for consumption, the United Kingdom is on the first position, with 13.3 million tons.

Milk industry in Romania went through an extremely difficult period caused by several factors: prolonged economic crisis, diminution of sales under the background of purchasing power diminution, the unprecedented increase in the price of utilities, the black market that reached 60% of total and the aflatoxin scandal that began in early March 2013. The aflatoxin scandal

determined an unprecedented diminution of milk and dairy consumption, the figures supplied by the officials at that time ranging from 45% (APRIL) to 20% (Ministry of Agriculture).

According to the Romanian Employers' Association in Milk Industry, the small and medium-sized producing companies mostly suffered, as they did not have an outlet for their products any more: the retailers ordered less, and certain buyers of the large trade networks preferred to import finite products.

The consumption decline is also the result of the loss of the habit to drink milk on a daily basis.

A study by Euromonitor conducted in 2010 reveals that Romania is among the last three countries in Europe as regards milk consumption per capita, followed only by Slovakia and Bulgaria. Thus, in the year 2010, milk consumption per capita in Romania reached 36 liters (equivalent of about 100 ml/day), compared to the European average of 64-65 liters in countries like Switzerland, Netherlands, Belgium, Slovenia or Serbia. In the nutritionists' opinion, the recommended daily milk consumption is 250 ml/day, which is twice as high compared to the present milk consumption per capita in Romania.

According to a study of the company Tetra Pak, while the consumption of other categories of liquid dairy products continue to increase at an average yearly rate estimated at 6.9% in the period 2011-2015, milk consumption will continue to decrease at an average yearly rate of 4.9%. This diminution of milk consumption is largely determined by the diminution of unpacked (unprocessed) milk consumption.

Although the packed milk will continue to increase at a yearly average rate of 2.8% in the period 2011-2015 (the UHT milk has an average yearly increase of 3.9%), this increase will not compensate the massive diminution of unprocessed milk quantities.

Although the quantity of collected raw milk diminished by 21% in the period 2007-2011, the production of dairy products resulting from industrial processing fluctuated, increasing in certain products and decreasing in others.

Out of total dairy market, the cheese market represents about 50%, while milk and yoghurts account for 30% and 20% respectively.

In the year 2012 compared to 2011, production was down by 11475 tons (-5.2%) in fresh consumption milk and by 162 tons (-1.7%) in butter.

Production increases in the year 2012 compared to the previous year can be mentioned in the following products: cheeses, including the cheese quantity obtained from cow milk exclusively (89.4% of total cheese production) by 4596 tons (+7.4%), acidulated milk (yoghurt, drinking yoghurt and others) by 6011 tons (+4.1%) and fresh consumption sour cream by 431 tons (+0.9%).

In Romania, although the **raw milk price** in the year 2012 was the lowest in the EU-27 countries (24.89 euro/100 kg), this is mainly dictated by the evolution of neighbour markets – Hungary, Poland, and Slovakia – as the main sources for covering the national deficit (Fig. 5).

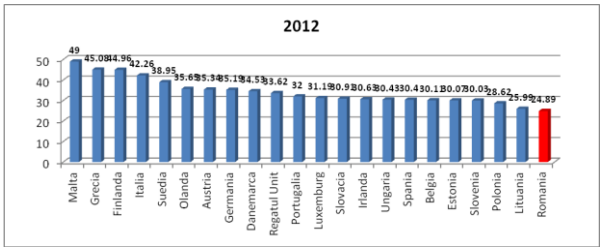

Fig. 5. Raw milk procurement price in the EU-27 countries (euro/100 kg)

The **import** of dairy products was worth 130-140 million euro in 2010, while **exports** reached about 40 million euro, with an increasing tendency.

In the case of cheese and curd, the imports reached 2000 tons, worth 70 million euro, while the exported quantities were larger, i.e. about 2700 tons, with a value of only 15 million euro, which reveals that the exports consisted of raw products, curds, and quality finite products were imported instead. In quantitative terms, the imports followed an increasing trend, from 4365 thousand hl of milk in 2007, to 5771 thousand hl in 2011,

while exports doubled, to reach 2234 thousand hl in 2011.

CONCLUSIONS

Romania after the removal of milk quotas – modalities to bridge up the productivity gaps

The milk sector in Romania features significant discrepancies in terms of productivity compared to EU-27. This can be explained both by the internal structure of the Romanian dairy farms (small size, high fragmentation), inadequate or defective use of production factors (human resources included), and by the current deficient institutional framework and infrastructure.

Although Romania is on the 7th position among the EU-27 countries with regard to the dairy cow herds, the average yields are quite modest (3776 kg/cow head), Romania being among the last countries on the list, only before Greece and Bulgaria.

The milk sector performance is seriously affected by the high fragmentation. Thus, in the year 2010, 59 % of the total dairy cow herds were found on very small-sized holdings of 1-2 heads, while the total number of holdings was 761528, with an average size of 1.83 heads/farm. Although a diminution by 28% of the number of holdings was noticed as compared to 2007, the number of non-performant small-sized holdings remains very high, which reveals the persisting subsistence and semi-subsistence phenomenon in the milk sector in Romania, which is the main factor that hinders competitiveness increase. However, as a positive fact, we can notice the percentage diminution of holdings with 1-2 cow heads in total holdings (from 92% in 2007 to 87.27% in 2010), simultaneously with the increase in percentage of the holdings with 3-5 heads (from 6.3% in 2007 to 10.14% in 2010). The holdings with 51-100 cow heads and over 100 heads, which we consider commercial or potentially commercial, account for only 0.11 %, yet they have 6.25% of the total dairy cow herds.

From this point of view, due to the weak competitiveness of the Romanian dairy farmers compared to the farms from the developed countries, it is estimated that after the milk quota removal, many farmers with 2-3 cow heads/farm will disappear from the Romanian market, as December 31, 2013 means the end of the term for non-conform milk processing.

One of the main conclusions is that farm size is an important factor in profit maximization. That is why a support measure for the Romanian farmers after 2015, through the "Milk Package", would be to **encourage the farms with at least 50 cows, with land into ownership, by projects with financial support**, on the example of certain countries like Netherlands, Belgium, which massively invest in dairy farm revamping, so that these can increase their animal herds up to 10 times, towards 3000 heads. One of the reasons for this is the fact that the farms smaller than 50 cow heads cannot supply sufficiently large milk quantities to processors so that to find a buyer for their production, not to speak about the capacity to bargain good prices and make a profit.

At the same time, another measure from the "Milk Package" envisages **strengthening the role of contracts.** In the milk and dairy sector, in order to ensure that the respective contracts are conform to certain adequate minimum standards and to guarantee the good operation of the domestic market and of the common market organization, it is necessary to establish certain basic conditions at EU level for the utilization of these contracts. As the status of certain dairy product cooperatives can already include rules with similar effect, these cooperatives must be exempted, for simplification purpose, from the obligation to conclude contracts. In order to ensure the effectiveness of such scheme, this has to be also applied in the case when the intermediaries (collectors[2]) collect the milk from farmers for delivery to processors. In this case, the contract must comply with the

[2] "collector" means an enterprise that transports the raw milk from a producer or from another collector to a raw milk processor or to another collector, in which case the raw milk ownership is transferred each time.

following: to be concluded before the delivery, to be under written form and contain the price due for delivery, which can be a fixed price and indicated in the contract and/or may vary according to certain specific clauses, namely the market situation evolution, estimated on the basis of market indicators, the delivered volume and quality or composition of delivered raw milk. The following must be also specified, namely: the volume that can be and/or is to be delivered, the calendar of deliveries and validity period of contract.

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SPACE TOURISM ORGANIZATION AND ADMINISTRATIVE ARRANGEMENT OF TOURIST TRAFFIC ANALYSIS BY LOCALITY BUŞTENI

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Abstract

In order to achieve the best possible tourist activity it is needed that besides natural resources and human and material resources to be able to satisfy the tourist requirements. These material resourcess are known as "material and technical basis". This is represented by: accommodation and food, transportation, treatment and leisure facilities and is primarily conditioned by the development and modernization of existing material and technical basis. Thus, a highly attractive tourist area can not be on offer before receiving the facilities for receiving and retaining travelers. Buşteni, resort includes Poiana Ţapului,s dominated by steep Bucegi and has a great starting point for ascents, but it is also a true spa, indicated not only for leisure but also for the treatment of diseases of debility, physical and mental fatigue and digestive disorders and glands. Most representative indicators commonly used to express movement and travel and its main characteristics are: number of urge tourists, average daily number of tourists, number of days / tourist, average length of stay, receipts from tourism and tourist traffic density, tourists' relative preferences. Analysis of tourist traffic in the tourist areas of Buşteni will be achieved by calculating these indicators. Tourist traffic indicators reflect the distribution and evolution in time of tourism internal and external demand,. They also reflect the behavior of the application on the use of vehicles and equipment and can be used for studying the origin and destination of tourism demand, the average stay and fidelity to a particular destination.

Key words**:** *average length of stay, distribution of tourism demand, occupancy of hotels and hostels, tourist traffic analysis, tourist traffic density,*

INTRODUCTION

Tourism-environment relationship is of great importance, protection and conservation of the environment being an important condition for development and tourism development [4].This complex relationship is operating in the both directions. Natural environment through its components represent the fundamentals of tourism resources and tourism activity, on the other hand, has a both positive and negative influence on environment, modifying its components.

Environment is defined as quality of life, living conditions of the people and the natural habitats suitable for animals and plants. Quality of life is determined by the long-term availability in sufficient quantity and of appropriate quality resources such as water, air, earth and space in general and raw materials [2].

All the natural factors and also those created by human activities and, especially, tourism quality create travel motivation, forming "raw material" of tourism. Therefore, maintaining a high quality of natural resources is a prerequisite for ongoing the development of tourism consumption.

For over 30 years, starting with the Conference on Environment in Stockholm in 1972, the world began to recognize that environmental problems are inseparable from those of welfare and economic processes in general. Thus, it was to talk about the concept of "sustainable development" which is a process that takes place without destroying or depleting resources, ensuring development [10].

Tourism is an important contribution to maintaining and improving environmental quality, manifesting itself as an active factor of sustainable development is in the interest or

involvement in this matter and to work in cooperation with other industries in the quality of the resource base and survival it [9]. The volume of tourist flows is determined by demand and its factors, and the degree of technical equipment territories.
This explains, in large measure, the attraction of different areas, with potentially sensitive close but differentiated technically equipped.

MATERIALS AND METHODS

In order to analyze the area's tourism traffic travel logs, and for better organization and planning tourism will calculate the most representative indicators of tourist traffic as follows: average daily number of tourists, no. overnight stays, average length of stay, tourist traffic density and capacity utilization coefficient of accommodation. Data were collected from INSSE, Prahova, Bucharest. and data provided by pension "HOUSE MAIA" which were statistically processed and interpreted.

RESULTS AND DISCUSSIONS

Buşteni is a small mountain town in the north of the county Prahova, Muntenia, in central Romania. It is located in the Prahova Valley, at the foot of Bucegi Mountains, with a maximum altitude of 2505 m has a population of 10,374 inhabitants [1].
The average altitude is 850 m Busteni is one of the most popular mountain resorts, offering spectacular views, lots of opportunities and holiday activities, from skiing to hiking. Located 135 km from Bucharest, covers an area of 8.517 km along the valley between "Vadul Cerbului" and tunnel dug in the mountain spur "Muchia Lungă" ("Long Edge") [3].
Busteni includes Poiana Ţapului is dominated by steep Bucegi and has a great starting point for ascents, but is also a true spa, is indicated not only for leisure but also for the treatment of debilitating illnesses, physical exhaustion and intellectual and disorders of the digestive tract and glands.
As in other areas, in Prahova County are recorded reserves and natural monuments which geobotany domain, geological, flora, fauna, forest, with great scientific value, landscape and tourism, which have been placed under the protection of the law.
An interesting point on Prahova County is the geological reserve "Salt Mountain" from Slănic massive salt karst forms of carving and anthropogenic lake. Located on 1.8 hectares of salt mountain appeared to crash the Baia Baciului pit, pit which in the eighteenth century salt is extracted [5]. The collapse caused a landslide on the slope above, which resulted in massive denudation. Subsequent collapse of the ceiling in the middle of the mountain opened a pit 50 m deep, 20 m were filled with water, forming Lake Bride. Monument of rare beauty "Salt Mountain" is unique to our country [7].

Analysis of tourist traffic at the local level in Busteni

Table 1. Tourism supply and demand indicators on Busteni

Indicators	2008	2009	2010	2011
Number of overnights stays	9,058	11,594	11,000	14,475
Number of Romanian tourists	3,975	4,561	2,737	2,568
Number of foreign tourists	975	709	1494	1984
Total number of tourists (foreign + Romanian)	4,950	5,270	4,231	4,552
No. of Hotel accommodation	929,000	966,100	1,062,500	1,017,200
Number of places in hostels	74	80	108	111
The average length of stay	1.83	2.20	2.60	3.18

Statistical Yearbooks of Prahova County, the City Buşteni

a.Index of global tourist demand change*= [(No. Romanian tourists + No. Foreign tourists) per current year/(No. Romanian tourists + No. Foreign tourists) per previous year]*100*

$$\Delta CG_{0-i} = \frac{CG_i}{CG_0} \cdot 100$$

Where: CG_i *- global tourism demand in year "i"*

CG_0 *- global tourism demand in "0".*

$\Delta C_{t2008-2009}$ = (5,270/4,950) * 100 = 106.46 %
$\Delta C_{t2009-2010}$ = (4,231/5,270) * 100 = 80.28 %
$\Delta C_{t2010-2011}$ = (4,552/4,231) * 100 = 107.58 %

The index of global tourist demand change increased by 6.46% in 2009, and then it was descending by 19.72%. In 2011, tourism demand has increased again by 7.58%.

b.Index of global tourist demand distribution between domestic demand and external demand

Ici = *[No. Romanian tourists per current year / (No. Romanian tourists + No. Foreign tourists) current year]*100*

Ice = *[No. Foreign tourists per current year / (No. of Romanian tourists + No.of Foreign tourists) current year]*100*

$$\Delta CI_{0-i} = \frac{CI}{CG} \cdot 100 \; ; \quad \Delta CE_{0-i} = \frac{CE}{CG} \cdot 100$$

where: *CI - domestic tourism demand;*
CE - foreign tourism demand.

I_{i2008} = (3,975/4,950) * 100 = 80.30 %
I_{e2008} = (975/4,950) * 100 = 19.69 %
I_{i2009} = (4,561/5,270) * 100 = 86.54 %
I_{e2009} = (709/5,270) * 100 = 13.45 %
I_{i2010} = (2,737/4,226) * 100 = 64.76 %
I_{e2010} = (1,494/4,226) * 100 = 35.35 %
I_{e2011} = (2,568/4,552) * 100 = 56.14 %
I_{e2011} = (1,984/4,552) * 100 = 45.58 %

From the above analysis and results it can be seen that the largest number of tourists who come to the city Logs are Romanian pensioners, while the number of foreigners is very low, mainly due to the fact that they do not prefer hotels and pensions.

c.Index of (domestic and foreign) demand variation in time

Ici = *(No. Romanian tourists per current year / No. Romanian tourists per previous year)*100*

Ice = *(No. Foreign tourists per current year / No. Foreign tourists per previous year)*100*

$$ICE_{0-i} = \frac{CE_i}{CE_0} \cdot 100 \; , \quad ICI_{0-i} = \frac{CI_i}{CI_0} \cdot 100$$

Where ICE_{o-i} *- index variation in external demand;*

ICI_{o-i} *- index of variation in domestic demand.*

ICI_{2009} = (4,561/3,975) * 100 = 114.74 %
ICE_{2009} = (709/975) * 100 = 72.71 %
ICI_{2010} = (2,737/4,561) * 100 = 60 %
ICE_{2010} = (1,494/709) * 100 = 210.71 %
ICI_{2011} = (2,568/2,737) * 100 = 93.82 %
ICE_{2011} = (1,984/1,494) * 100 = 132.79 %

From the above calculations, it can be said that in the period 2009-2011 tourism demand both in domestic and foreign markets, increased from year to year, and the maximum increase is 110.71%. External demand has also increased by 40%.

d.**The** ***monthly concentration coefficient (in 2011)***

Cc = *[No. Tourists per each month / (No. Romanian tourists + No. Foreign tourists) per year of calculation]*100*

It is calculated by dividing the number of tourists in the month with the most total number of tourist arrivals a year A_t.

$$C_c = \frac{LM}{A_t}$$

For this, we have to take into considerayion the year 2011 and the number of tourists every month as follows: January 427, February 362, March 346, April 438, May 326, June 467, July 456, August 495, September 315, October 1244, November 1237, December 2439 - ***A_t = 4552 tourists***.

$C_{c\ ian}$ = (427/4,552) = 0.093
$C_{c\ feb}$ = (362/4,552) = 0.079
$C_{c\ mart}$ = (346/4,552) = 0.076
$C_{c\ apr}$ = (438/4,552) = 0.0962
$C_{c\ mai}$ = (326/4,552) = 0.071
$C_{c\ iun}$ = (467/4,552) = 0.102
$C_{c\ iul}$ = (456/4,552) = 0.100
$C_{c\ aug}$ = (495/4,552) = 0.108
$C_{c\ sept}$ = (315/4,552) = 0.069
$C_{c\ oct}$ = (244/4,552) = 0.053
$C_{c\ nov}$ = (237/4,552) = 0.052
$C_{c\ dec}$ = (439/4,552) = 0.096

Tourist highest concentration was recorded in June, July and August and the lowest

concentration of tourists in 2011 was in October and November.

e.Indicator of total accommodation capacity evolution between „0" and „i":

I_{LC} = *(No. beds per current year / No beds per previous year)*100*

$$\Delta LC_{o-i} = \frac{LC_i}{LC_o} \cdot 100$$

$\Delta C_{t\ 2010\text{-}2011}$ = (1,017,200/102,500) * 100 = 99.23.%

$\Delta C_{t\ 2009\text{-}2010}$ = (1,062,500/966,100) * 100 = 109.97%

$\Delta C_{t\ 2008\text{-}2009}$ = (966,100/929,000) * 100 = 103.99%

Number of beds in the period 2008-2011 had a downward trend from 9.97% in 2009-2010 decreased with 0.77% in 2010-2011, but with an increase in 2009 compared to 2008 by 5,98%.

f.Index of customer evolution between „0" and „i"

I_T = *(No. Romanian tourists+No. foreign tourists per current year) / (No. of Romanian tourists+No.foreign tourists per previous year)*100*

$$\Delta T = \frac{TP_i}{TP_o} \cdot 100$$

Where: *TP_i - Tourists in hotels in the "i";*

TP_o - Tourists in hotels in the year "0".

ΔTp_{2009} = (5,270/4,950) * 100 = 106.46 %
ΔTp_{2010} = (4,231/5,270) * 100 = 80.20 %
ΔTp_{2010} = (4,642/4,231) * 100 = 109.71 %

In 2009-2011 the pensions of city tourists coming Logs experienced growth in 2009 and 2011. The largest increase recorded in the number of tourists is increasing in 2011 being 9.71%. And in 2010 was a decrease of 19.08% tourists.

g.Index of overnight stay evolution

I_N = *(No. overnight stay per current year / No. overnight stay per previous year)*100*

$$\Delta N = \frac{NH_i}{NH_o} \cdot 100$$

Where: *N - overnight*.

ΔNp_{2009} = (11,594/9,058) * 100 = 127.66 %
ΔNp_{2010} = (11,000/11,594) * 100 = 94.87 %
ΔNp_{2011} = (14,475/11,594) * 100 = 124.84 %

Number of overnight stays was an increasing trend up to increase knowledge in 2009 when it increased by 27.66%. And in 2010 was a decrease of 5.13% overnight stays.

h.The evolution in time of the average length of stay *is calculated according to the following formula*

$$\Delta \overline{S} = \frac{\overline{S_i}}{\overline{S_o}} \cdot 100$$

where: *S_i - average length of stay in a given time interval "i";*

S_0 - the average length of stay at the time of "0".

$\Delta S_{m\ 2009}$ = (2.20/1.83) * 100 = 120.21 %
$\Delta S_{m\ 2010}$ = (2.60/2.20) * 100 = 118.18 %
$\Delta S_{m\ 2011}$ = (3.18/2.60) * 100 = 122.30 %

The average stay in the analyzed period was unstable evolution, showing decreases and increases.

i.Indicator occupancy hotels (hotel occupancy indicator)

It reflects the use of supply in a given period, i.e. the hotel business based on the capacity installed:

Cuc = *[no. of overnight stay (No tourist days) / (no. beds * no. of supply days)] * 100*

$$G_o = \frac{NH \cdot 100}{LH \cdot Z} = \frac{NT \cdot S}{LH \cdot Z} \cdot 100$$

where:
G_o - occupancy percentages;
NH - number of nights;
LH - number of places in hotels;
Z - the number of days of tourism;
NT - number of tourists,.
S - average length of stay,

G_{2008} = [9,058/(929,000 x 365)] * 100 = 0.00267%
G_{2009} = [11,594/(966,100 x 365)] * 100 = 0.00389%
G_{2010} = [11,000/(1,062,500 x 365)] * 100 = 0.00283%

G_{2011} = [14,475/(1,017,200 x 365)]* 100 = 0.00328%

Hotel occupancy in 2008-2011 is increased in 2009 compared to 2008, decreased in 2010 and increased again in 2011.

j.Indicator in relation to population density tourism = *[(No. of Romanian tourists + No. foreign tourists) / no. inhabitants] * 100*

$$D_{t_{i-0}} = \frac{T_{t_{i-0}}}{Population} \text{ (tourists / no. inhabitants)}$$

where:
T_{i-0} *– Total Romanian tourist + total foreign;*
Pop - its population,

Years	**2008**	**2009**	**2010**	**2011**
Local people	11260	10783	10584	10327

Statistical Yearbooks of Prahova County

$D_{t\ 2008}$ = (4,950/11,260) = 0.43
$D_{t\ 2009}$ = (5,270/10,783) = 0.48
D_{t2010} = (4,226/10,584) = 0.39
D_{t2011} = (4,552/10,327) = 044

k.Tourist density indicator in relation to area = *[(No. of Romanian tourists + No. foreign tourists) / area] * 100*

$$D_{t_{i-0}} = \frac{T_{t_{i-0}}}{Area} \text{ (tourists / km}^2\text{)}$$

where:
T_{i-0} *- total Romanian + foreign tourists;*
S - area of the village– 8,517 km^2*,*

$D_{ts\ 2008}$ = (4,950/8,517) = 0.58
$D_{ts\ 2009}$ = (5,270/8,517) = 0.61
$D_{ts\ 2010}$ = (4,226/8,517) = 0.49
$D_{ts\ 2011}$ = (4,552/8,517) = 0.53

CONCLUSIONS

Economic and social development is combined with tourism development in that specific tourism activities by their complexity, contributing to the overall development of the area, while this development will in turn cause an increase in tourist traffic.

Locals and local authorities are trying to diversify the rural tourism supply and demand after the tourist market trends. Farmhouses built or which provide features that outside countries. That appeared competition between tourism and agro pensions due to the low number of tourists who choose to accommodate the agro pensions. Therefore pensions are growing agro touristic pensions face facing a serious decline.

The national tourism be tried removing the insulation and Romanian village development, allowing its use. To help create the purpose and existence of funds in their direction.

The European Union is willing to allocate some lend for rural development. Some people accept the responsibility for long-term development taking into account the national interest and international requirements

Endowed with great tourism potential varied, diversified and focused by the existence of landforms combined throughout, a favourable climate for tourism for most of the year, a potentially rich fauna and flora species and ecosystems single in Europe spa treatment with natural factors, with cultural heritage - historical and global reference architecture, Prahova county may fall among attractive tourist destinations in Romania and even Europe.

The main measures that should be applied to achieve tourism development activities and tourism development in the locality Logs could be: the creation of programs and funds to co-finance regional development projects, linking with the national programs of local and regional expansion communications in tourist areas, modern and efficient transport, promote regional tourism potential through participation in tourism fairs, the execution of advertising campaigns, preparation of brochures with information about the area's tourism potential and suggestive images in this sense, media hostels and agrotourism farms.

Tourism is an important contribution to maintaining and improving environmental quality, manifesting as an active factor of sustainable development is in his interest to get involved in this issue and to work in cooperation with other industries in the quality of the resource base and survival it.

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IMPACT OF THE ECOLOGICAL TREND UPON HOUSE BUILDING

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Abstract

The American and Romanian house market has imposed harmonious and comfortable living in ecological houses whose building does not affect the environment. The implementation of modern and efficient building of long-term sustainable houses has resulted in a new ecological building technology by the Wood Framing System which is developed and applied on a large scale in the US. This system is a cheap and accessible method to build houses and preserve them in time, as well as provide all the comfort demands. Also, the houses built within this system are adapted to any architecture style (traditional, contemporary, and futurist). The house structures built within the Wood Framing System are conspicuous through the optimum use of the wooden material, resistance, stability, ductility, low weight which thus reduces the earthquake impact, durability, high thermal comfort, competitive price. At the same time, the building time on the site is up to 70% lower, compared with the brick-based houses. Within the framing system, a wooden-structure house provides important advantages, and thus has become of interest on the Romanian market.

Key words: *drywall, extruded polystyrene, foundation, mineral wool, roof, waterproofing, wood*

INTRODUCTION

Wood is the only healthy, natural material of construction [1].

We like to go back to the woods because this material emits sensory stimuli that we agree [3]:

- the warmth and the decorative safety of its colour, its texture, direct links with nature, harmony, beauty, atmosphere, brilliance, delightful smell, acoustics, grace.
- so-called diseases of civilization: stress, aggression and other psychological trauma manifest themselves very rarely to those who live in an environment rich in wood [6].

A cut tree is a symbol. The dominant quality of the fir-tree is fluidity [4]. It helps us to overcome energy bottlenecks created by fatigue and stress [2].

In and around spruce and fir trees, choleric people calm down, their hot temper finds a balance. The two trees clean and open respiratory pathways, strengthen the lungs and helps us breathe more deeply. Spending some time in the vicinity of spruce and fir trees, we find activation of blood circulation and strengthening of the nervous system.

Houses built on wooden structure to customize the exceptional qualities of thermal and noise insulating floors that adjusts vertically and transfers heat very effectively dampens even the most bothersome noises [12].

Wooden structures can get more easily and cost-effectively, varied and spectacular finishes.

Due to the low weight, the foundation needed to ensure the sustainability of construction is much lower than that required of a house brick, thus significantly decreasing the cost of construction of a wooden house without the required safety level also decreased [7].

Because wood is an environmentally friendly material that consumes less energy in industrial processes [8], is a biodegradable material, well adjusted the temperature and humidity in the house, it is recommended and preferred builders beneficiaries.

Great flexibility offered by wooden architectural avoids high energy consumption and hence energy savings [9].

In case of fire, wood is the only material that preserves the mechanical properties in seismic zones is recommended only wooden houses [10].

MATERIALS AND METHODS

Construction material used in making houses Residence Wood Framing system is wood. These green house offers the opportunity to achieve at a very reasonable price and in a short time

The technology used for building insulation prevents exchange with the outside temperature thereby keeping very cool part of the house in summer and warm in winter. To be as fire resistant as any other building, there is the possibility of treating the wood with fire resistant solution, but at the same time does not affect the health of occupants of the house.

Because construction is easy to apply technological system and good elasticity, wooden houses made in this way provides a far superior seismic durability of masonry houses. Internal vapour barrier and anti-moisture exterior finishes provide protection against moisture structure of any kind.

The walls are made of prefabricated panels form through modern technology and which considerably reduces the execution time of construction, thus decreasing the cost of labor for installation and therefore the building.

RESULTS AND DISCUSSIONS

Building new houses using the Wood Framing highlights the strength, stability, ductility, low weight of its own (thus reducing the impact of earthquakes), durability, comfort and competitive price. Also, the execution of such houses is up to 70% less than for the houses based on a masonry structure. The advantages of a house made of Wood Residence achieving walls in the form of prefabricated panels, leads to an increase in the quality execution of these elements, through their factory with modern machines and technologies, and an appropriate technical and at the same time reduced prefabrication during the construction of the building, thus decreasing the mounting labor cost and building default.

Due to low weight, the foundation needed to ensure sustainability of the building is much reduced compared to that required by a house brick, thus significantly reducing the cost of house construction o, without diminishing the desired safety.

Houses built on wooden structure are conspicuous by the exceptional thermal and sound-isolating qualities of their floors. They adjust vertical heat transfer and lower even the most disturbing noises very effectively (noises made by the high heel shoes, children's trample, the falling of a heavy object).

Wooden structures can receive varied and spectacular finishes more easily and at lower costs. A well-executed floor, according to details of the structure, is as strong as one of reinforced concrete. Because of the lightweight construction, the technological system applied and their very good elasticity, prefabricated houses made in this way offer higher earthquake durability than the masonry-based houses. The internal barrier against steam finishes and anti-humidity structures provide protection against moisture of any kind.

The technology used for building insulation prevents the temperature exchange with the outside, therefore it keeps the coolness of the house very much during summer and warmth during the winter. To be as fire resistant as any other construction, it is possible to perform a wood treatment solution to fire resistance, which it does not affect the house residents' health.

The ecological green houses on wood structure has several advantages such as:

»Wood structure is light in comparison with masonry, it requires a simple foundation is elastic, providing increased resistance to the construction.

»High heat and sound coefficient.

»Reduced execution time (2-3 months maximum).

»It creates an interior and exterior finishing based on latest materials.

»Pleasant appearance (can build different shapes and patterns).

»The inside of the apparent beams and framework.

»Modules are executed and finished in the factory, the assembly in the field takes maximum 48 hours.

Foundation

The foundation is made of reinforced concrete in Amvic casings (casings of expanded polystyrene) that provides both resistance and thermal insulation at this level.

House base

It is a basic element of construction, which runs through tracing and attachment wall structure for resistance to the building foundation.

It is made up of a wooden cupboard with sizes 45x90, 45x135mm, having the same width with a wall that supports it.

The house base is placed on a waterproof layer and provisionally set in the first phase hobnailed or wood screws and, after mounting on the ground floor walls, they are connected through reinforcing-steel clips existing in the foundation.

House girdle

It provides link to the top of the prefabricated panels. The girdle is fixed to the upper side of the prefabricated panels by knocking in nails.

It consists in a wooden cupboard with sizes 45x90, 45x135mm, having the same width with the wall which it supports.

It is fixed to the connection sections of the prefabricated panels in lagging sections.

Walls

The walls are the main elements of strength and stability of construction, providing vertical takeover of the floor and framework weight, as well as horizontal loads from earthquake and wind load and transmit them to the foundation.

An important advantage of the framing system is the possibility to make the walls in the form of prefabricated panels. This leads to increased quality of execution of these elements, through their factory with modern machines and technologies and an appropriate technical control; at the same time, prefabrication significantly reduces the execution time on the field of construction, thus decreasing time length of the construction on the field, the default cost and building cost.

The items of the vertical resistance walls are fixed to the girdles of the horizontal panels with square nails and galvanized metal. The exterior wall panels are usually coated with OSB plates of 12mm in size, which provides rigidity and work plan of the lateral sides, thus resulting in a rigid wall in its plan. The interior wall panels are arranged against the wind by horizontal and bent rulers between the pillars.

The walls can be as follows:

• resistance of wood reinforced with metal attachment and special nails.

• exterior walls: expanded polystyrene, OSB, wood wardrobe, mineral wool, metallic structure for gypsum board, gypsum board.

• interior walls (for compartmenting): gypsum board, steel structure for gypsum board, wood wardrobe, mineral wool.

Fig. 1. Structure of ecological house

Fig. 2. Foundation and structure of ecological wooden houses

Floors

The floor is made of wooden beams over the foundation, special metal sets that fix the foundation beams, OSB panels, extruded polystyrene, light blankets.

The floors are the horizontal building loads of weight taking over people and furniture and walls, and transmitting their weight to the walls; at the same time, they ensure the cooperation of walls and horizontal distribution of horizontal wind loads and earthquake.

The main elements of resistance are the floor beams. The beams consist of closet resinous wood, sections of 50x135, 50x180, 50x230, 50x280mm, interspaces placed at 400 and 600mm,. rigid in connection with transverse distance of the closet with the same section. The system of beams and cross distance with the floor form solid and rigid assembly with a rigid washer.

The beams are connected to the girdles by nails, bolts, cupboards and galvanized shackles

The support layer is put over the pillars, and it consists of: wood floor plane of 22 and 45mm in thickness, the floor 24 and blind 45mm, OSB plates of 22mm in thickness. The floor is available in a single layer or two layers in different directions.

On the bottom of the floor, beams can directly strike the layer of finish: gypsum board, panelling, etc. or may remain apparent and is varnished.

Floor above the ground floor: It is made of gypsum board, steel structure for gypsum board, wood beams, mineral wool, OSB, extruded polystyrene, special metal attachment.

The framework is built of wood shingle oil, metal tiles or Metrobond tiles.

The roof resistance structure can be run in two variants, namely: chairs on roof framing, and roof framing beams on the lattice.

Frameworks are composed of a bucket and squared pane of resinous wood, sections of 90x90, 90x135, 135x135, 135x180, 135x230mm together forming a rigid stiff resistance by windproof and roe buck which supports the pane, the chert merge. The roof timbers have section dimensions 50x90, 50x135, 50x180, 50x230mm.

The floors on lattice beams are composed of strong wooden lattice, made in closets of 45x90mm, and merge the nodes with feathered claws by pressing. The lattice beams are windproof on the upper foundation to create a rigid cover plan.

In both cases, the cover support consists of 24mm in thickness or OSB plate of 12 mm.

Waterproof of bitumen membrane is placed over the layer support of the cover

As cover material, there can be used: tile, galvanized, onduline sheets ofbardolyne, Lindab board, eternite, etc.

Ceilings inclined to the attic, consisting of the structure itself, are thermally isolated with mineral wool mattresses, with of 150, 200mm in thicknesses.

Finishes

Finishes are made as follows:

•decorative plaster on the outside or American Siding PVC
• washable dye works in the interior.
• wooden staircase.
• PVC joinery plus double glazing windows.
• interior doors wooden cell.
• exterior doors in PVC, metal or wood.
• sanitary, heating and electrical installations.
• central heating.
• steel radiators or heating in the floor.
• doubleclick parquet.
•tiles and faience in the bathroom and kitchen.
• sanitary items.
• treated and flame retardant fir.

Fig. 3. Ecological house built in Wood Framing System

Fig. 4. Ecological house built in Wood Framing System

CONCLUSIONS

Due to the advantages of running costs and reduced time to achieve these green houses Wood Framing system, they are very popular at the moment compared to conventional systems implementation and execution of the houses.

Because of the lightweight construction, applied technology system and good elasticity, wooden houses made in this way provides a far superior seismic durability of masonry houses.

Increasingly, more and more builders and beneficiaries choose this system of construction of green houses, especially at the holiday because wood has special qualities. Wood is flexible and easy it more resistant to earthquakes to masonry or concrete house. With a large number of advantages in the realization of timber houses, is a material becoming more preferably in construction.

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ECOLOGICAL MANAGEMENT SYSTEM FOR PROTECTION AND PRODUCTION OF BLACKCURRANT (RIBES NIGRUM L.) IN SOUTH OF ROMANIA (I)

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Abstract

The formulation of agricultural policies in Romania, starting with the European ones will lead to the development of sustainable agriculture, which will take into account the environmental component, but also the protection of consumers. Creating a sustainable agriculture may not be a feasible approach without an interdisciplinary contribution, firstly without implementation of biotechnology to reduce the impact of disruptive and command for the removal of certain risk factors that may be present in certain points of the food chain. The activities undertaken in the framework of the study achieved the overall goal: to present the pilot-phase of agricultural technology to the culture of Ribes nigrum, with the goal of obtaining and use of plant biomass in the pharmaceutical and food industries in line with EU criteria relating to food safety and security. The methodology developed in the framework of the theme was particularly complex but can be synthesized according to the objectives pursued, the life cycle of a case study in populations and of the factors involved in developing ecological management for control in working methods for biological field studies (life cycle study methods and control of the main pest Aphis grossulariae Sulz. (Homoptera:Aphididae) and the main pathogenic fungus Mycosphaerella grossulariae (Auers.) Lind. The main results obtained from research carried out refer to the implementing of the ecological management system model.

Key words**:** *biological control, blackcurrant**,** food security, sustainable development*

INTRODUCTION

Like any other conception of science, integrated control concept had his own development, at the first crystallization of the concept by S. A. Forbes in 1880 [3] until the introduction of the wording "integrated control" by J. S. Kennedy in 1953 [6] (quoted by Teodorescu [15]) and developed into a first step in an experimental work by Stern [14]. In 1966, at the first FAO Symposium on integrated control issues, held in Rome, R. F. Smith and H. T. Reynolds have released "integrated pest control formulation" (IPM), defining the method as "a system of management of pests using all appropriate techniques, in a interdisciplinary manner to reduce the pest population density and to keep them at levels lower than those at which produce economic damage" [12]. Subsequently, the understanding of the important role of biological component within the integrated control led recently to a new wording ("Ecological Pest Management Based") (EBPM), proposed by the Committee on Agriculture, National Research Council of the National Academy of Sciences of the USA. EBPM represents a holistic approach of problem pests, based on knowledge of the principles and ecological processes, biological interactions that take place across cultures and seeking solutions to manage the expense of pests. This concept is defined by three fundamental goals:

i) the protection of man and the environment;
ii) assure a profit for farmers;
iii) long-term sustainability.

Ecological management is appropriate content of current situation, in which, as a result of various human activities and primarily the

abuse of insecticides, there has been an increase in the pest population specific to different cultures and polyphagous, but also the manifestation of some species attack that they posed no problems so far, there are just as effective, with faunal elements reduced populations. What is missing in plant protection, at least in some cases, is an organic base. Influencing of plant pests and natural enemies of pests, without looking at these organisms as components of biocenoses, in interaction with various other bodies, without knowing well what are the factors inducing their population dynamics, without looking at the pests and their natural enemies as subsystems of a system integrator, within which there is reciprocal mechanisms regulating staff is the cause of global imbalances in recent decades in agricultural crops. Trying to solve the problem of pests without a global approach to the effects of human intervention on the close interdependence of species within the biocenoses, may not lead to effective solutions to economic and ecological development [8]. In this respect, opportunities are necessary to achieve the strategic objectives of ecological management in blackcurrant crops are:

1) the assessment of the level of control naturally;
2) determination of economic threshold for the application of alternative methods;
3) maximizing action of natural biotic factors;
4 simultaneous application of the different control methods.

MATERIALS AND METHODS

The methodology developed in the framework of the theme was particularly complex but can be synthesized according to the objectives pursued, the life cycle of a case study in populations and of the factors involved in developing environmental management control:

A. working methods for biological field studies;
B. working methods in the laboratory

In view of the spread of medicinal and aromatic plant research will take place in two locations (case studies) to comparison of the signs.

A.1. Methods for the study of the egg stage

Depending on how ovipositors are used two ways:

• analysis of plant organs (leaves, shoots, stem, flower, root, fruit) through observations and dissections;
• soil surveys

A.2. Methods for the study of the stage of larva /pupa

The methodology of the study for highlighting the various aspects of the larva or pupa stage is similar to the egg stage of study. The dimensions of the polls and their number are the same.

A.3. Methods of study required by imago

For adult study 6 methods will be used:

A. 3.1. Barber traps method

Barber traps are traps installed at the surface of the ground in order to capture mobile fauna of arthropods on the surface of the ground in a given period of time. The trap consists of a container with a capacity of 300 cm3 which is inserted into the soil with ground-level opening. Inside this container is inserted a 4% formaldehyde solution. The opening dish cover with a plastic cap leaving between opening and cover a distance of 4-5 cm. collection time for such a trap is 48 hours after installation. Biological material collected is conserved in alcohol 70% and are studied in the laboratory.

A. 3.2. Light traps Method

In general, the imago stage of many insect species showing a positive phototropism to UV radiation, and this behaviour is based on the method of study. The traps are made of a metal or plastic Cone (funnel-shaped). Above the funnel snaps a portable with a fluorescent light bulb installation of pile head R3. The hopper is fixed in a cubic box or metal frame with sides covered with a wire mesh or plastic. This is the collection of biological material. Samples are taken at 24 hours, per hectare are required a minimum of two such traps. Biological material collected be similarly anaesthetized with ether or ethyl

acetate are preserved in alcohol and the sieve in the laboratory.

A. 3.4. Pheromone traps method

This method of capturing adults applies in particular to the species of Coleoptera and Lepidoptera which synthesized a specific sexual pheromone. For the research proposed in this project, where the method can be patentable as for the most important pests specific to medicinal and aromatic plants has not been synthesized a specific pheromone. Exceptions are the species studied recently in Cluj-Napoca for a collective from ICCRR the *Byturus tomentosus* F. (Coleoptera: Byturidae), *Synanthedon tipuliformis* Clerck (Lepidoptera:Sesiidae) [2], [4], [9].

A. 3.5. Sticky traps with bait type Multigard®.

The method is based on the principle that the insects exhibit positive phototropism to a certain spectral components of the white light or a specific attraction for certain vegetable substances. They are made from plastic panels with dimensions of approx. 28 x 23.5 cm and is lubricated with a special adhesive. The number of such traps is variable according to the area (currently 10/ha).

A. 3.6. Method of direct collections

Unlike the previous ones which are quantitative methods this qualitative method is one that allows us a more rigorous analysis in relating to its host plant-insect relations or between the latter and other useful species of biocenosis.

A. 3.7 Methods concerning the application of integrated ecological control

In at least two towns in the area of research will be chosen for experimental batches of 100 m^2 that will test the integration of alternative control methods known and currently applicable as new solutions proposed by this study within the framework of environmental management.

RESULTS AND DISCUSSIONS

In this study we want to reveal theoretical and practical aspects of the basic principles for the implementation of the components of an environmental management model based exclusively on alternative methods of control had established. For the conceptual working base the next strategic ways was taken into account:

• the basic principles of systemic ecology;
• the establishment of the dominant populations;
• correlation of dominant populations of biological cycles;
• knowledge of the factors which influence the dynamics of dominant populations;
• environmental control management applies a specific localized and delimited ecosystem spatial and temporal;
• harmful organisms are not eradicated but maintained at or below a level called the economic threshold (PED);
• potentiation or maximizing natural factors;
• shaping culture technologies (especially those intensive) in the direction of monitoring the impact of factors which can cause unexpected consequences;
• introduction to decision support systems within the framework of interventions on the control of pests and diseases (expert systems, simulations of processes, precision farming);
• environmental management model is based on modular, harmonious processes associated and flexible, able to replace each other according to certain unexpected changes of the factors;
• the use of biological control agents in accordance with the culture and technology with economic needs, requirements\/energy and the ecosystem toxicological;
• apply model considering the interdisciplinary methods and the possibility of applying statistical and mathematical modeling;

A key stage in any program of ecological management refers to the precise identification of the lowering of the main agents significantly affecting the economically productive capacity of the system. The effectiveness of both types of measures (preventive or curative) is largely dependent on correct identification and determination of lowering agents. In this study although the notion of impact is in accordance with the definition of Clark

(1989), environmental impact assessment, in this case blackcurrant biocenosis crops cannot be carried out in accordance with EU regulations and Directive 85/337/EEC, whereas the aim of this research does not permit tackling an area so vast. With all the limits and questionable interpretations [2], [19], [20] assessment and evaluation of the impact of agricultural technologies anthropogenic ecosystems biodiversity using of the diversity is up at the moment and in correlation with the possibilities of the proposed research, the only way to reveal the preventively (Williams et al., 1990) direct effects and probable invertebrate populations of these agricultural practices. Sure, for a precise and exhaustive evaluation according to the multidisciplinary evaluation of a communication from the Environmental Impact (CIM) (Lee and Colley, 1992) is a comprehensive and independent study that goes beyond the context of this research. In this sense, the data obtained in this paper may be useful only in terms of qualitative and quantitative parameters comparison of invertebrate populations representing the reflection in the analyzed material changes at the level of biocenoses from which samples have been extracted. Information relevant to the research program on implementation of environmental protection management (EBPM) was highlighted for list of species present in blackcurrant crops in the area of research. Were made quantitative and qualitative methods of inquiry and analysis concerning the collection of biological samples from the two agricultural ecosystems in order to establish plant health in three areas of experimentation, alternative methods of ecological protection of crops against diseases and pests and has achieved the technology for both bushes, currant and raspberry and agro-technical methods for maintenance of specific crops. Achieving the goal on the development of experimental model for environmental management system in crops of blackcurrant in Romania stages of understanding concepts related to environmental protection systems and the necessity of their application have been completed and exceeded by most of those involved, specialists or users. Moreover, it is just interesting to note the fact that practitioners, farmers, especially those in the private sector, have exceeding theoretical knowledge through practical application of components or various components of ecological agriculture to a very broad spectrum of cultures, even of basic agricultural crops. We can cite many examples of this but this is not the scope of this research. If we should relate to the extremes of the two concepts of citing on Pfeiffer, 1951 "which is just under the biological aspect is also advantageous from the economic point of view" [10] should remember that the process now begun more than a century and a half established by Liebig in known work "applications of chemistry in agriculture" [7] and heavily publicized and then to the present day under the assertion of "intensive" type agriculture has exacerbated two high-impact environmental factors: excessive and industrialization. Beginning of the end for this concept generated by revealing all the more salient to the harmful effects of those two factors listed above command began with the concerns highlighted by Rudolf Steiner, to counteract the negative effects of agriculture on the mainly various components of the biosphere, it has developed a coherent system, adding to the effective practices of peasant agriculture specific technologies through the use of subtle energies, can "contribute to the harmonization of terrestrial and cosmic factors" [13].In the international scientific literature have crystallized a number of specific terms which over the last half-century have evolved in accordance with the application and interpretation of the data obtained during and after implementation/experimentation. We will stop at two definitions of significant theoretical, one other fundamental and applied by generating numerous theses resulted from the experimentation of various alternative methods, the final stage is the most difficult to derive their integration into a coherent system of ecological protection, sustainable. The first definition, universally accepted today by

many centres and research institutions is that to which we referred in the preparatory phase of the environmental management system proposed by the Committee on Agriculture, National Research Council of the National Academy of Sciences of the United States and called on the basis of ecological Pest Management or EBPM (short for Ecological Pest Management Based) (Fig.2). This environmental management is a holistic approach to the problem of pests, based on knowledge of the principles and ecological processes, biological interactions that take place across cultures and seeking solutions to manage the expense of pests. This concept is defined by three fundamental goals:

- the protection of man and the environment;
- to ensure a profit for farmers;
- long-term durability.

Biological control is considered as the most important component in this new approach to population control. It is assumed that each culture has its specifics, so that raises different problems for controlling pest populations, what must be known. Environmental protection management is derived from the older formulation of integrated pest management or IPM (short name in English: integrated pest management [6]) (Fig. 1). In the original conception of this type of management proposes lowering agents monitoring by understanding the interactions with other organisms and environmental factors. Over 77 definitions are included in the database, The Database of IPM Resources (DIR) [16] and, despite some differences in forms shall be deemed unanimously on some common elements:

- a conception of resource management such as a culture or a system as a functional component of the ecosystem; the actions, activities that are considering restoring, enhancing and maintaining the natural balance of the system and not the elimination of species; standard monitoring must make it possible to assess the populations of harmful and useful; the manager must consider steps to control natural growth (or at least hinder or restrict the natural biological control disruption) on target organisms;

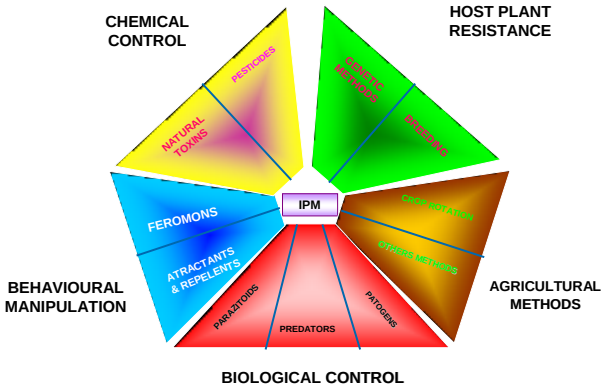

Fig. 1. Integration of components of control and monitoring in the management system of IPM (Integrated Pest Management)

- understanding that the presence of a pest should not necessarily a problem; before applying a disruptive method, an appropriate decision should assess whether a method is to be applied or not;
- a reconsideration of all the shares or pest management options before a decision to be taken;
- a combination strategy of integrating all the methods/techniques/procedures as possible in a manner as consistent. From the multitude of approaches and definitions developed and applied in different areas and different cultures to complete and interesting seems the definition formulated by Stephen R. Gliessman, which assumes and extends deadline for environmental management from that of "sustainable agriculture" understood as "a comprehensive system for the production of food, nutrients and other components are harmoniously balanced resources with which to preserve a clean environment ensure social equity and economic efficiency, viability to all public sectors internationally and intergenerational" [5]. Inherent in this definition is the idea that sustainability must be extended not only global but undefined in time towards all living organisms, including humans. Colorally of this complex definitions are the following add-in system:

Sustainable agro-ecosystems based on:

• maintaining the natural resources base;

• establishing minimum of artificial inputs control external factors of culture\/farm system;
• the management of pests and diseases through the mechanisms of the internal control system;
• stability and rapid regeneration after disturbance processes (technology, harvesting, etc.).

Use of renewable resources

• the use of renewable energy resources;
• using the jumpers of nitrogen;
• use of any recyclable materials from those manufactured synthetically;
• use your own internal resources to farm;
• waste recycling resulting from internal processes.

Minimize the use of toxic products

• reducing or eliminating the use of materials that have a high potential to produce both for the natural environment, health workers or consumers;
• use or approach procedures/processes or methods that lead to the elimination of the possibility of natural environment pollution with nitrates, toxic gases or other materials generated by combustion;
• avoiding overload with chemical fertilizers.

Soil conservation

• using sustainable methods for conserving nutrients and organic matter stocks in the soil;
• minimize erosion through: (a) the use of perennials); b) methods of harvesting or reduce non-invasive mechanical ones; c) the use of bio protector mulch).

Water conservation

• efficient use of irrigation system;
• the non-irrigated crops;

Conservation of genetic resources

• preservation of valuable germoplasms seed;
• maintaining local lines;
• the use of varieties/species in descent.

Preservation of invested capital

• Bank debits to a minimum;
• a drastic reduction of expenditure.

The ecological management of interrelationships between species

• restoring ecological interspecific relationships and avoiding reduction or simplification;
• management of disease, pest and weed rather than control them;
• the use of cover crops, or intercropping;
• integrated livestock;
• maximizing the density of beneficial organisms
  - o in soil: micorize, Rhizobium, nitrogen clamps
  - o a useful insects: shelters for pollinators, predators, etc.
  - o a potentiating of beneficial species increases and the inundative releases.
• nutrient conscious consumer
  - o a nutrient flows to management recycling and reuse;
  - o a reintegration of the cultural residue as natural fertilizers;
  - o when any are required inputs (input) resource-recycling;
• minimizing system disorders

Consistency with the characteristics of the local environment

• correspondence between net culture fund and the productive potential and physical limits of landscape/local territory;
• crops adapted to the local landscape.

Factors diversification

• Territory
1. maintaining buffer zones;
2. growing in the strips;
3. the use of crop rotation.
• Biological resources
1. cultures and multiple species;
2. integration of the animals;
3. varieties and varieties as different to boost production throughout the entire production cycle.
• Economics
1. avoiding dependence on a single product/culture;
2. the use of alternative markets;
3. organic products;
4. support of associations of organic agriculture, sustainable community;
5. independent marketing;
6. food processing prior to sale;
7. the orientation of high quality agricultural products;
8. searching methods, or alternative resources;
9. the practice of rural tourism;

10. avoid dependence on external factors

Preparing the workforce

• ensure that local workers are aware of sustainable development and control processes in place;
• use of knowledge of local inhabitants;
• promoting leadership and management of knowledge-transfer direction in favor of the boss-underling or "top-down";
• does not require knowledge but uses experts and farmers to learn;
• schools recycling;
• exchange of experience between farmers;
• exchange of experience between farmers and consumers;
• encourage partnerships between local communities and development groups and intergenerational;
• ensure agricultural labor warranty;
• educates and teaches human staff be familiar with the principles of sustainability and environmental/sustainability.

Management of the whole system

• use planning processes that are adapted to different agro-systems scales:
• land (landscape);
• individual households;
• farms;
• communities;
• bioregions;
• nation;
• minimizing the impact of adjacent systems.

Maximizing long-term benefits

• maximizing the intergenerational;
• maximizing quality of life and livelihoods in rural areas;
• facilitating transfers between community members and the intergenerational;
• the use of long-term strategies;
• development of plans through reassessment and flexible adjustable parameters;
• incorporating the elements/components of sustainable development in the overall design and management of the system;
• preserve soil fertility.

Conserving and protecting health

• human health;
• cultural health;
• the health of the natural environment;
• the health of plants and animals.

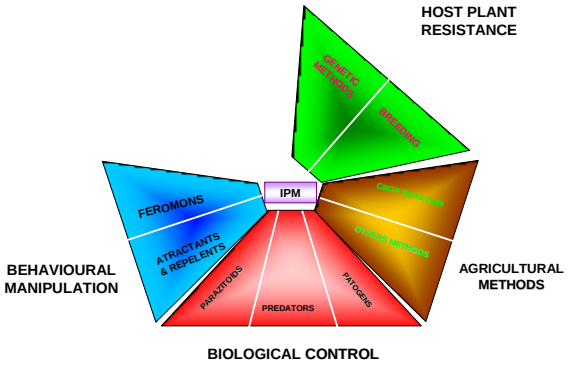

Fig. 2. Pest management on ecological bases (EBPM) by excluding chemical control methods

We mentioned earlier that there are a multitude of definitions in addition to the widely accepted formulated of and the process of redefinition of the concept continues today. A recent formulation of an Australian ecologist Bill Mollison and of his assistant, David Holmgren [1] termed very plastic “permaculture" (abbreviated combination of "permanent and "culture" or "permanent agriculture") our attention lately, not so much by the novelty as defined by the elements or concepts in the field of systemic ecology and, especially, through coherent system model, very close to the concept developed by the Romanian school of ecology as remark Pilarski, 1994: "Pattern < permaculture > is one of the most integrated systems as holist design methodologies in the world" [11]. Extract from the definition given by the two researchers, an item which we emphasize and consider it essential in highlighting the character of the concept: "Permaculture refers to a restructuring of human habitats and food production systems; land use and development needs of the community in the direction of harmonious integration of human settlements, microclimate, perennial and annual plants, animals, soil and water in a steady and productive community; focus is not on these elements alone, but rather on the interrelations that are created between them because of the way and where we place them on the ground (landscape)". This synergy is achieved and shall be consolidated over time through "imitating" the model offered by nature. This system whose features

highlighted by Pilarski in "Restoration forestry" [11]:
 is one of the most integrated systems design holist of methodologies in the world;
 can be applied to create productive ecosystems for human use or for reconstruction of degraded ecosystems; can be applied to any ecosystem, regardless of the degree of degradation;
 analyzing and validating traditional knowledge and human experience; incorporating both sustainable agricultural practices and strategies of environmental and agricultural management techniques from around the world;
 promote clean farming "organic" which does not use chemical pesticides and methods which pollute the environment; It is a bridge between traditional methods and the most modern techniques emerging;
 one of the main objectives is to maximize symbiotic activity and synergistic activities of components;
 is at once an urban development plan and a design of rural land;
 is a system that applies to a specific site, a specific and productive system of a specific crop.
It is closest to the strategy that we wish to apply in carrying out management system of ecological protection of blackcurrant crops in south Romania.
Since the establishment of the research plan of the study and establish of the main objectives was taken into account as a main criterion of necessity, the establishment and development of components of the system of environmental management proposed that the overall objective of the project. Interrelationship between the components patterns resulted in the light of experience and collaborative opportunities related to your field of work highlighted in the diagram (Fig. 3) and everyone's experience in the field of modular components of the integrated system-target goal pursued.
In addition to referencing the processes related to the integration of each component were core activities included:

• study conditions for research and experimentation in the areas where crops were placed; study of faunal structure and biodiversity of species of arthropods in the cultures of research areas;
• evaluation of the local fauna with useful species role in biological control;
• identification of pathogens (viruses, bacteria, fungi);
• identification of harmful and useful arthropods;
• determination of the degree of attack and PED;
• development and implementation of ecological control methods of pathogens;
• development and implementation of ecological control methods of pest;
• development and implementation of agronomic methods;
• elaboration and implementation of biotechnical methods.

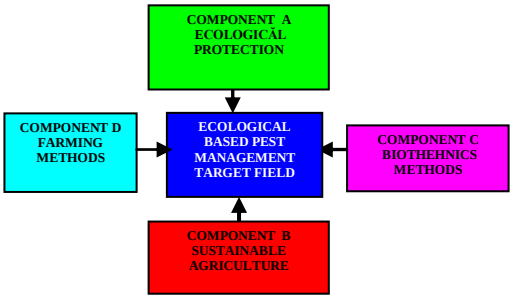

Fig. 3. Integration criteria of components in the ecological management

CONCLUSIONS

The activities carried out within the framework of the study in the implementation of the model were established the basic principles for the ecological management model based exclusively on alternative methods of control that include:
• basic principles of systemic ecology;
• establishment of the dominant populations;
• correlation of dominant populations of biological cycles;
• knowledge of the factors which influence the dynamics of dominant populations;

• environmental control management applies a specific localized and delimited ecositem spatial temporal;
• harmful organisms are not eradicated but maintained at or below a level called the economic threshold of lowering (PED);
• potentiation or maximizing natural factors;
• shaping culture technologies (especially those intensive) in the direction of monitoring the impact of factors which can cause unexpected consequences;
• introduction to decision support systems within the framework of interventions on the control of pests and diseases (expert systems, simulations of processes, precision farming);
• ecological management model is based on modular, harmonious processes associated and flexible, able to replace each other according to certain unexpected changes of the factors;
• the use of biological control agents in accordance with the culture and technology with economic needs, requirements/energy and the ecosystem toxicological;
• apply model considering the interdisciplinary methods and the possibility of applying statistical and mathematical modeling;
Within environmental protection component has been elaborated methods of protection integrated into the two difference systems consisting of complete elimination within the framework of the eco-system of chemical treatments: insecticides and fungicides;
The main stage in the implementation of the system consisted of investigating and making the conditions relating to the structure of the habitat, climatic conditions, soil structure, material, etc.;
We have been identified the main pathogens that cause diseases of plants with the loss of harvest and it is estimated the degree of dominant populations in case of attack;
We have established means of protection under both management systems: botanical products (biorationale) in the case of EBPM and systemic fungicides in the IPM case and a careful application of all preventive means;
Methods for monitoring the population dynamics of pathogens under prevailing systems/models have been established;
Have been experimentally tested a series of new products including bio-coded P1 and P2 have given very good results against the pathogen identified in principal crops in the southern area of the country (*Sphaeroteca mors-uvi* Berck.et Curt.) under the currant year 2009 and will be able to be patented after testing/experimentation in the next stage;
Species of useful and harmful arthropods, presence, relative abundance, number density, and their share in the dynamics of the system proposed in the model estimation/role of UFS species useful in reconstruction of biocenotic balance similar systems have been identified;
methods for monitoring the dynamics of populations of harmful and useful arthropods during crop vegetation of blackcurrant have been developed;agro-technical methods of crop protection, predominantly preventive role methods with special emphasis placed on the quality of genetic material, prevention of infection agent in nurseries, fertilizing and maintenance non-invasive biological components of the ecosystem were developed;
Biotechnical methods have been developed for monitoring and control of the main pest species integrated into the two systems/experimental models;
Have been carried out methods for useful beneficial insect growth under controlled conditions (species of Coccinellidae for *Aphis grossulariae* target populations).

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ASPECTS OF USING TECHNOLOGICAL MULTIFUNCTIONAL SYSTEM FOR BENEFICIAL INSECT MASS REARING

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Abstract

The paper studied the basic and technical research dealing with the obtaining of beneficial insects by development of suitable and economically feasible system for insect and arthropod mass rearing under controlled conditions and the design, achievement and testing/expert appraisement of one multifunctional technological system for beneficial insect rearing and releasing. Practically, the paper is proposing the introduction into plant protection strategy against pest insects of field crops of the specific biological control and biotechnical methods which are not the result of emphasizing of pest resistance and meanwhile are involved in reducing of impact environmental pollution risk. The research activity in the frame of this study is complex and multidisciplinary. The technical methods used consist in designing/drawing up of the components of multifunctional technological system for beneficial insect mass rearing, achievement, testing and optimizing and validation of the system. The main objective and result of this research program was to optimize the production, quality and effectiveness of mass reared natural pest enemies (especially insects) for the integrated or ecological pest management of field crops.

Key words**:** *biological control, biotechnology, mass rearing insect program*

INTRODUCTION

Recent developments in entomological research have augmented the importance of insect mass rearing colonies to basic research and practical control [7]. Research on insects can be facilitated in many ways if the insect species under study can be colonized and produced in the quantity needed for both basic and applied investigations [2]. One of the most exciting new developments in entomology is the role that insects themselves or products derived from insects may play in the future for the control of insects. The full development of these potentials may mean that in the years ahead the mass production of insects will become an important industry in support of insect control.

MATERIALS AND METHODS

This paper presents recent contributions and engineering developments and equipment specifications necessary for constructing a workable, economically feasible rearing multifunctional technological system capable of supplying a production of individuals from beneficial insects populations. This system should also be of value in developing different levels of technology for the mass rearing of other insects, pest insect including. The design of facilities for culturing insects is, or should be, a key topic in the broader subject of insect rearing.

RESULTS AND DISCUSSIONS

The ability to rear insects under controlled conditions has long been regarded as desirable or necessary to facilitate research on many aspects of entomology [5]. It is integrated in the informational system used for assisting the measures of sustainable utilization of the natural fond, as a fundamental layer of viable economical development and social welfare which necessitates a new approach on the biodiversity conservation strategy.

It is axiomatic that the ability to colonize insects under managed conditions is fundamental to virtually every aspect of entomological endeavour. Pest management schemes have actually come to rely upon rearing facilities like one of basic directions of sustainable management of resources and moderate-size populations of beneficial parasitoids and predators for inundative releases are being supplemented by large-scale production for mass releases over extensive geographical areas. Autocidal control measures rely absolutely upon massive releases for imposition of sterility on natural populations. Thus, the ready and constant availability of specimens makes possible the consideration of pest-control options not otherwise available and facilitates associated research or establishment of the priorities. Substantial numbers of insects are required for testing toxicants and behaviour – and growth-modifying chemicals, as well as for basic studies of the mechanisms involved in these and other physiological phenomena. The study of insecticide resistance, genetics, host interaction, insect pathology, epidemiology, transmission of insect-borne diseases, insect-related allergies, and other critical areas also consume large numbers of test insects. Concerns about the impact of agricultural practices on environmental quality, as well as the reduced effectiveness of traditional chemically-based insect and weed control measures, have increased the need for alternative biologically-based integrated pest management strategies which are economical and sustainable in nature. Many established pests such as the Colorado potato beetle and diamondback moth continue to cost growers millions of dollars each year in crop losses. Continuous use of pesticides to manage these and other agricultural insect pests has resulted in populations which are resistant to nearly all major classes of insecticides. The major objectives of parasitoids/predatory insect species it foresee: (i) design and optimizing artificial diets and other rearing techniques; (ii) the achievement of large-scale engineering developments and automatic equipment specifications necessary for construction of a rearing system capable of supplying a minimum of 10 million usable specimens/week; (iii) the establishment of biological stage and the best instars for releasing of parasitoids/predatory insect species; iv) drawing up of the releasing system. The Worldwide Directory of Aerobiological first published in 1990 contains in the fourth edition revised and updated information, with more then 2000 product listings, 276 active ingredients, 500 companies in over 42 countries to locate bio products, suppliers or sales agents. This shows the universal interest in agro biological products and proves also that parasitoids/ predatory insect species current stage are commercially available on the market. Among the greatest facilities worldwide, research-development units performing activities in the mentioned field it could mentioned those of Metapa (Mexic), Waimanlao (Hawaii), Stoneville and Boll weevil research laboratory (Mississippi), Phoenix (Arizona), British Columbia (Canada), Mission (Texas) and Niles (Michigan) [1]. In Europe many private companies are dealing with production of natural enemies on artificial diet like: Bunting Biological Control Inc., Koppert B.V. [12], CABI Bioscience, Chr.Hansen's Bio Systems and so on. Referring only on insects the agro biological industry would greatly improve the potential of selection, taxonomically speaking considering all taxonomic groups, over 1,400 beneficial insects are reared in facilities and laboratories, and among 50 are used on large-scale releases in biological control of some important pests [3]. Other research centres could be also listed:

→ Centre for Research and Development (CID), Spanish Council for Scientific Research, Jordi Girona 18-26 08034 Barcelona, Spain, phone: 343 4006100; Fax: 343 2045904, e-mail: leaam@cid.csic.es, (coordinator centre ENOF → European Network for Scientific Research Coordination in Organic Farming) [9];

→ Institute for Biodynamic Research, Brandschneise 5, D-64295 Darmstadt, Germany; phone: +49 6155 8421 0; +49 61016385 fax: +49 6155 8421 25; +49 6101

7948; e-mail: info@ibdf.de; spiess@ibdf.de [11];

→ Research Institute of Organic Agriculture (FiBL) – Forschungsinstitut für biologischen Landbau Ackerstrasse/Postfach CH-5070 Frick, Switzerland; phone: +41 62 865 7272/ Fax + 41 62 865 7273 e-mail: admin@fibl.ch [10];

Considering the recommendations of the Biological Diversity Commission [8], this project is focused on defining the populations/species as service rendering units according to the model introduced by Luck [4]. The concept allows the approach of the biodiversity conservation from an innovating perspective, focused on the biodiversity value for the society for a better development of the decisional process. The research activity within this field is constantly developing worldwide, under the influence of numerous local and global factors, as well as the clarification of some basic research aspects. Development of these systems materialized into a series of technical achievements which allowed defining the fields in which alternative means can be integrated in order to control the pest problem in agriculture. Along with the first industrial and experimental successes the resulted products, meaning the useful individuals or insect stages were defined, classified and introduced for sale under the name of "agro-biological products" in the plant protection field, at convenient prices. In the present paper the main components of the system elaborated will be designed and the work technical and physical parameters established:

- containment system**;**
- climatic system**;**
- light control system;
- relative humidity control system

Needham [6] was the first who clearly identified the basic requirements for successful rearing:

- Food;
- Protection from natural enemies;
- A suitable physical environment;
- Fit conditions for reproduction.

Over the years the recent researchable refinements of these elements in considering insect mass production are:

- Inexpensive standardized artificial media;
- Techniques for extracting insect stages from their media;
- Techniques for providing acceptable high-density space use;
- Full understanding of the chemical and physical stimuli mediating mating and oviposition;

The mass-rearing facility of RDIPP Bucharest was designed and builds with the governmental financing for providing main technological equipment (Fig.1).

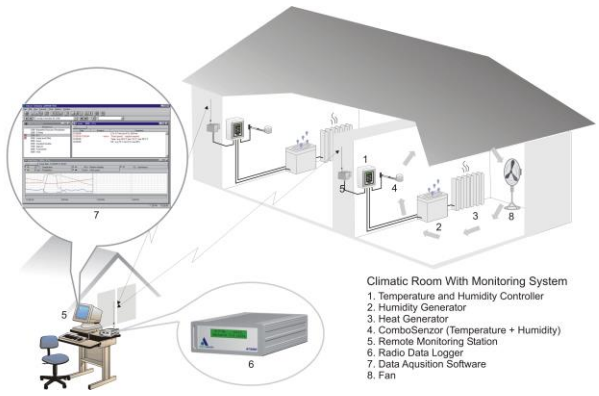

Fig. 1. The draft of facility controlled – environment system

This paper presents recent contributions and engineering developments and equipment specifications necessary for constructing a workable, economically feasible rearing multifunctional technological system capable of supplying a production of individuals from beneficial insects populations. This system should also be of value in developing different levels of technology for the mass rearing of other insects, pest insect including.

Engineering developments are discussed in this paper, and specifications necessary for technical and physical parameters of the system monitoring are presented. The construction of the system are versatile, modular concept to provide automated electronically adjustable environments parameters, i.e., accurate temperature, humidity heating and air filtered against airborne contaminants. The room's climatic

parameters are digitally controlled by the system designed in the block diagram of controlled-environment system showing the interfacing with all of the six chambers. The extended-memory unit the SDI-12 M512 interface. The complete system is composed by a central data-control bus links the six chambers in a parallel configuration to the control system. Since the HPxw4400 Workstation employs discrete-component logic and the remainder of the system is built around logic-level converters (wireless sensor interface) which are used to process the incoming and outgoing signals for system compatibility. The basic control scheme consists in four phases of each of the six chambers:

- measuring;
- data transmission;
- data processing;
- remote control unit.

During the first phase, the controller (Metrilog T707 unit) sequentially addresses each chamber, requests temperature data from the chamber, and then compares the received information with the desired programmed environment. The controller then transmits the appropriate command signal (temperature on or temperature off, or changing the desired level). Once the first phase has been completed, the second phase is initiated. The second phase is an RH scan and performs essentially the same tasks, turning the humidification circuit on or off. Consecutively the system has initiated the feedback turning on or off digitally all the sensors (relative humidity, MC light RF modem, radio data logger and so on).

CONCLUSIONS

Mass production of natural enemies has grown tremendously in the last period of time: it increased the number of species, the number of individuals produced, increased the quality of the material obtained, have evolved methods of growth, storage, packaging and transport, release of natural enemies.

Improvement of the methods of growth, production and marketing of a large number of specimens has led to depressed prices. Innovations in long-term storage of certain stages (e.g. by inducing diapauses), in transport and in release methods have led to increasing quality of natural enemies and biological control of cost reduction, which became more economical and easier to apply.

Natural enemies raised safely routed sun used successfully both in biological inundative battle (with the introduction of a large number of natural enemies for the destruction of a immediate without damaging the track establishment and reproduction in nature of this natural enemy) as well as in biological inoculate battle (with the introduction of a small number of natural enemies, in order to establish, their colonization and multiplication in certain areas).

Particularly important in ensuring the success of environmental manipulation has, what means maximizing the beneficial effects of species of natural enemies, by altering the habitats adjacent to launch sites, in order to ensure pollinators and nectariferous plants, places of wintering or unfavourable weather shelter.

The importance of systemic approach of the harmful insect-insect entomofagous for achievement in good condition of mass increase as a result of their parallel evolution and related pest populations, and the entomofagous were constituted as subsystems of dynamic systems, within which, through natural selection, have developed mutual adjustment mechanisms of herds, keeping them within the framework of an area of stability and permanence of the subsystems.

Through feedback mechanisms, each of which has the ability to adjust their birth rates and mortality compared with the corresponding parameters of the other, thereby inducing, appropriate adjustments, related, in the other subsystem. In the absence of intervention by pesticides, natural enemies have the ability to regulate livestock depending on the pest population density values, however, and participating in setting the latter, which means their food resources.

In natural ecosystems, selection, and retention time of these adjustment mechanisms protect both components of the system, avoiding the

use by over multiplication trophy resources available, it would jeopardize the long-term existence. In this case, a huge number of effective natural enemies, small flocks of host can disrupt these adjustment mechanisms, with the subsequent negative consequences on natural enemies.

Reducing the density of natural enemies, through various human activities, but primarily through pesticides, as well as the release of a small number of natural enemies in the event of large herds of pests, or inconsistency of the biological cycles of the two partners, creates favourable conditions for these pests, allowing them to increase their herds.

It is necessary to maintain a flock of pests in the field, the tolerable from economic point of view, because the reduction of pest density too is affecting as a last resort and entomofagous, by the absence of hosts available, leading to decreased density and therefore their efficiency. Permanent variations, with increases and decreases are related and mutually conditioned natural enemies and herd the pest, within certain limits, given the relative stability of the system, the ability to achieve a state of dynamic equilibrium in livestock populations, it tends to fail permanently and to return to this status, to avoid disruptions that would be outside of a certain area of stability.

If attempts to intervene as a factor of adjustment of the flocks of harmful insects, through growth and releases natural enemies.

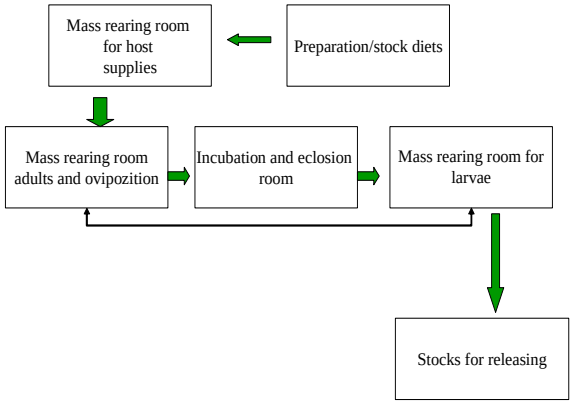

Fig. 2. Block diagram of major areas of RDIPP, Bucharest, mass – rearing facility

Special attention should be paid to avoiding damage mechanisms of self-regulation of the system of natural enemy-pest, by estimating populations, their correlation with livestock pests, continuous evaluation of the results. To mitigate the effect of interference, direct and indirect human intervention, due to the use of parasitoids and prey species of insects against insects or other animals considered to be harmful, it should therefore be substantiated both economically and ecologically.Digitally system for physical parameters monitoring are originally designed and build at RIDPP Bucharest and now are in the patented proceeding (Fig.3).

- PARAMETER 1 – Humidity (RH %)

Adiabatic Humidifiers DEFENSOR ABS – EICHLER

- PARAMETER 2 - Airflow circulation

Vane axial blower fan for airflow circulation

- PARAMETER 3 – Temperature

Electrical heating element (2,000 W) in each room

- PARAMETER 4 – Light

Block fluorescent located at the ceiling center of each chambers. All parameters are digitally controlled at the standard configuration which can be easily modified by remote control from every earth location. Digitally sensors provided by METRILOG GmbH Austria and radio remote units for data transmission by A730MD and Data Logger (A730SD).

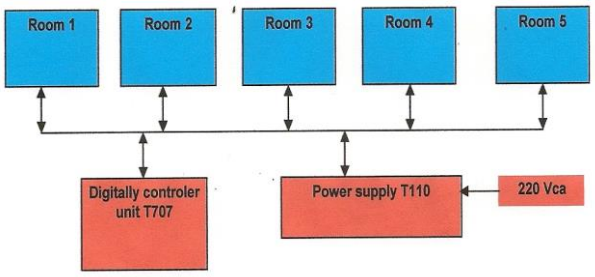

Fig. 3. The draft of digitally monitoring system of climatic conditions inside of facility chambers

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POSSIBILITIES TO USE NATURAL EXTRACTS FROM MEDICINAL AND AROMATIC PLANTS (MAP) LIKE BOTANICAL REPELLENT OR INSECTICIDE COMPOUNDS AGAINST PEST INSECTS IN ECOLOGICAL CROPS (II)

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Abstract

Botanical insecticides have long been touted as attractive alternatives to synthetic chemical insecticides for pest management because botanicals reputedly pose little threat to the environment or to human health. The body of scientific literature documenting bioactivity of plant derivatives to arthropods pests continues to expand i.e. repellents based on essential oils extracted from Chenopodium ambrosioides, Eucalyptus saligna, Rosmarinus officinalis to mosquitoes, or cinnamon oil, sandalwood oil and turmeric oil are previously reported as insect repellents evaluatede in the laboratory conditions. With the constantly increasing problems of insecticide resistance and increasing public concerns regarding pesticide safety, new, safer active ingredients are becoming necessary to replace existing compounds on the market. The present study carried out in the period 2010-2012 comprises a review of two insect repellents, followed by some new research conducted in our laboratory on plant-derived insect repellents. The two alkaloids tested against the Colorado potato beetle, Leptinotarsa decemlineata Say in laboratory conditions was obtained by water and alchohol extraction from two vegetal species, Cichorium intybus L. (Asterales:Asteraceae) and Delphinium consolida L. (Ranales:Ranunculaceae). The tests carried out in laboratory and field experimentally plots under cages permit to evaluate several other compounds for repellent activity of lacctucin alkaloids.

Key words**:** *alkaloids, biorational insecticide, repellents*

INTRODUCTION

Biological resources and the potential for sustainable exploitation of crops of medicinal and aromatic plants in our country are huge and represent an important component of sustainable agricultural development in Romania. From existing data, our country has in his flora of over 3,700 different plant species, cultivated or spontaneous, with therapeutic action, of which 800 species have properties defined and phytotherapeutic, 370 species have been recognized as having the qualities of pharmacy-dynamic effects, but which have not yet been fully studied from the scientific point of view [1]. The European Pharmacopoeia is adopted in all EU Member States includes 98 species of plants. Minimum risk pesticides are exempt from EPA registration and they are currently listed at [12]. A result of various international research and traditional practices, medicinal and aromatic plant list is in constant dynamic; so that the European Association of producers and processors of medicinal and aromatic plants has expanded the number of plants to about 1,500. Pest

control using chemical insecticides had been from many years a critical activity for environmental protection. For sustainable agriculture purposes the largest agricultural use of insecticides became undesirable and dramatically dangerous for entire wildlife and of course, human health. Considering unanimously out of question the toxicity of pesticide use "softer" category of some substances with potential insecticide effect would be desirable from an environmental standpoint. From theoretical point of view there are some terms which are trying to define such active substances against a large spectrum of agricultural pests [6]. In terms of chemical composition of these substances are secondary plant metabolism compounds such as: terpenoidele (mono-, sesqui-, di-), poliacetilene, alkaloids, flavonoids and polysaccharides [4]. From the multitude of attempts to name and to define of the natural products we select the two terms which are constantly found in the world scientific literature but used without been a unanimously accepted definition. In Europe more often is speaking about the botanical insecticides or botanicals which are according to Science Dictionary [11] an insecticide made from a substance extracted from plants, e.g. pyrethrum, derived from chrysanthemums, or nicotine, derived from tobacco plants. In USA pest control materials that are relatively non-toxic with few ecological side-effects are sometimes called 'bio-rational' pesticides, although there is no official definition of this term. Often their effects are not as long lasting as those of synthetic pesticides and some of these products may be very difficult to find. Botanical insecticides have long been touted as attractive alternatives to synthetic chemical insecticides for pest management because botanicals reputedly pose little threat to the environment or to human health [10]. The body of scientific literature documenting bioactivity of plant derivates to arthropods pests continues to expand, yet only a handful of botanicals are currently used in agriculture in the industrialized world, and there are few prospects for commercial development of new botanical products. There is no doubt that botanical insecticides are an interesting alternative to insect pest control, and on the other hand only a few of the more than 250,000 plant species on our planet have been properly evaluated for this purpose. Considering that more than 80,000 are MAP found in different agro-ecosystems around the world but only a few are used as green plants synthesize and preserve a variety of biochemical products for industry. Many of them are extractable compounds and used as chemical feed stocks or as raw material for various scientific investigations and industrial and medicine utilization. This means that the potential for the future may be huge. In fact, plants like neem *Azadirachta indica* (Meliaceae) have shown excellent results and there already are commercial products in the market made from it. Azadirachta indica and also many species of Zingiberaceae MAP from India or vetiver (*Vetiveria zizanioides* from Thailand) are also related groups of plants having in their part chemical constituents which are active like botanical insecticides or repellents activity.Insect repellents are an alternative to the use of insecticides. In general terms we can say that certain natural substances having a range of biological properties against insect pests, fungal, bacterial, and viral diseases, and weeds have been used for centuries to protect crops. These plant substances are more rapidly degraded in the environment, and some favor beneficial insects. Some plants can produce a diverse range of secondary metabolites such as terpenoids (mono-, sesqui-, and di-), alkaloids, polyacetylenes, flavonoids, and sugars. Terpenoids are some of the most successful examples of pesticides among these substances. The present paper have been resumed the older research carried out in period 2006-2008 in the RIDPP laboratory of entomology with the objective to indicate one important strategy to ecological use of botanical product in plant protection [7].

MATERIALS AND METHODS

The test species *L. decemlineata* was collected from the field by two methods and maintained on natural food under controlled conditions.
Experimental design in the Nicotox assay (laboratory conditions).
There were 7 variants with 3 replicates each/10 larvae by replicate:
V1 – larvae L1, 10 individuals; V2 – larvae L2, 10 individuals;
V3 – larvae L3, 10 individuals; V4 – larvae L4, 10 individuals;
Product: Nicotox (sulphate distilled)
Application mode:
a) sprayed on food substrates aqueous solution
b) sprayed directly on larvae
V5 – imago, 10 individuals;
Application mode:
a) sprayed on food substrates aqueous solution
b) sprayed directly on adults
V6 – eggs 1 egg cluster
Sprayed directly on eggs
V7 – check treated with distilled H_2O

Experimental design for the repellents assay

The *Cichorium intybus* and *Delphinium consolida* plants were collected from the field in the period 2.07-4.07.2010 when the flowering process is beginning and then all the vegetative organs of plants were completely developed. The organs of plants collected were separated, chopped and small mortared. From each organ, aqueous and alcoholic solutions were prepared at five different concentrations. According to the vegetative plant organs the plant pieces were either driest at 25 ± 1ºC, RH 60 ± 5% and photoperiod of 16 hours continuous light either fine small mortared like green mass. The dried plant parts were boiled at 100ºC and the decoction obtained were used in field experiment treatments. The experimental field were establishing like multifactor design including subdivided parcels (30 variants with 4 replicates each).
Four factors were tested:

- the vegetative organ (3 hypothesis tested);
- the plant processing mode (2 hypothesis tested);
- the solution concentration (5 hypothesis tested);
- the extract composition (2 hypothesis tested)

The vegetal extracts were administrated by spraying the plant leaves on the both sides. During the 10 days of experiments 2 splashing were made, one at the beginning of experiment and the second after 5 days. The observations were registered after 24, 48, 72 hours and 10 days after first splash.

RESULTS AND DISCUSSIONS

In connection with the preparation and extraction of plant insecticides at present intense research is conducted at various research centers around the world (being very advanced research from two American universities (Iowa and Cleveland), which is why research in this area should be developed, and the results should be achieved with a database [3], [9]. The toxicity of the extracts of plants on insect varies greatly even if the extracts are made of the same species. This is due to the different phases of the plant, the percentage moisture content of the plant at the time of collection, enforcement and the extraction method, different compounds have an extract can act synergistically or antagonist. The most important factor that determines the variation in the response of the various species of insects from the vegetal extracts is the native or acquired resistance against a product or another. The most conclusive example is that of the Colorado beetle whose digestive system is adapted to consume glycoalkaloyds of solanine type and, on the other hand this species is endowed with a series of enzymatic mechanisms that allow it to destroy all toxic compounds which are used in chemical control of this species [2], [8], [5]. The results obtained in the Nicotox assay were presented in the Tables 2 and 3. In the first table the variants with larvae and adults tested are included and in the table 2 are presented the variant with eggs tested. There was a special commentary related to this egg

test. The Nicotox formulation was very active against the first instars larvae of Colorado potato beetle (V_1). The mortality percent registered was biggest after 24 hours after the product administration in all replicates. Related to the vegetal extract administration in the case of sub variants tested its mean that the lethal effect was predominant of ingestion effect in the $L_2 – L_4$ larvae case while at the first instar the mortality was especially by contact administration. The Nicotox 5 insecticidal activity was reduced during the development of the insect meaning that at the third instars (L_3) the mortality percent reach 100% only of a minim interval of 48 hours and maximum of 120 hours. In the case of L_4 larvae the mortality was at the level of standard chemical product meaning between 80-100% after 7 days from first application.

Table 1. List of the more important botanical insecticides used in pest control programs around the world

Common name	Chemical formula	Origin/plant species	Status
azadirachtin	C35H44O16	*Azadirachta indica*	Not official
anabasine	C10H14N2	*Nicotiana glauca*	Not official
Pyrethrin I	C21H28O3	*Chrysanthemum cinerariaefolium*	ISO 765
Pyrethrin II	C22H28O5	*Chrysanthemum cinerariaefolium*	ISO 765
Jasmolin I	C21H30O3	*Chrysanthemum cinerariaefolium*	Not official
Jasmolin II	C22H30O5	*Chrysanthemum cinerariaefolium*	Not official
Cinerin I	C20H28O3	*Chrysanthemum cinerariaefolium*	ISO 765
Cinerin II	C21H30O5	*Chrysanthemum cinerariaefolium*	ISO 765
nicotine	C10H14N2	*Nicotiana tabacum*	ISO 765
Matrine/China	C15H24N2O	*Sophora japonica, S. subprostrata*	Not official
rotenone	C23H22O6	*Tephrosia virginiana, Lonchocarpus utilis, L. nicou, L. urucu, Derris elliptica, D. involuta, Duboisia sp., Verbascum thapsus, Mundulea sericea, Piscidia piscipula*	Not official
sabadilla	C32H49NO9 C36H51NO11	*Schoenocaulon officinale*	Not official
quassia	Not yet establish	*Quassia amara, Q. indica*	Not official
d-limonene	C10H16	*Citrus medica, C. aurantifolia, C. maxima, C. reticulate, C. latifolia, C. limon, C. limonia, C. paradisi, C. sinensis, C. tangerina*	Not official
Ryania/ryanodine	Not yet establish	*Ryania speciosa*	Not official

The adults of *L. decemlineata* were totally immunes at the product Nicotox 5 action, whatever of sex and doses administrated the result confirming the fact that the resistance of this species of control products is biggest in the adult cases.

In the case of *L. decemlineata* a species with a pregnant defoliation activity the control product is very important to be efficient against the egg stage giving the possibility to prevent from the start the leaves consuming.

Table 2. Efficiency of treatments with alkaloid NICOTOX 5 against *Leptinotarsa decemlineata* Say under laboratory conditions

Variant	Replicate	% mortality after period of:						TOTAL	CHECK PLOT
		24 hour	48 hour	72 hour	96 hour	120 hour	7 days		
V1	R1	100,00	-	-	-	-	-	100,00	0
	R2	100,00	-	-	-	-	-	100,00	0
	R3	100,00	-	-	-	-	-	100,00	0
	Average	100,00	-	-	-	-	-	100,00	0
V2	R1	100,00	-	-	-	-	-	100,00	0
	R2	100,00	-	-	-	-	-	100,00	0
	R3	100,00	-	-	-	-	-	100,00	0
	Average	100,00	-	-	-	-	-	100,00	0
V3	R1	50,00	100,00	100,00	100,00	100,00	-	100,00	0
	R2	60,00	100,00	100,00	100,00	100,00	-	100,00	0
	R3	30,00	90,00	90,00	90,00	100,00	-	100,00	0
	Average	46,66	96,66	96,66	96,66	100,00	-	100,00	0
V4	R1	40,00	60,00	90,00	90,00	90,00	90,00	90,00	0
	R2	30,00	40,00	80,00	80,00	80,00	80,00	80,00	0
	R3	30,00	50,00	100,00	100,00	100,00	100,00	100,00	0
	Average	33,33	50,00	90,00	90,00	90,00	90,00	90,00	0
V5	R1	0	-	-	-	-	-	-	0
	R2	0	-	-	-	-	-	-	0
	R3	0	-	-	-	-	-	-	0
	Average	0	-	-	-	-	-	-	0

Table 3. Efficiency of treatments with alkaloid NICOTOX 5 against *Leptinotarsa decemlineata* Say stages under laboratory conditions

Variant	Replicate	% appearance after.....days:					% appearance check plot after days:		
		9 days	13 days	14 days	TOTAL	% mortality L1	5 days	6 days	TOTAL
V6	R1	0	0	0	0	100,00	10,00	10,00	100,00
	R2	5,88	5,88	5,88	5,88	100,00	90,00	100,00	100,00
	R3	0	38,46	63,46	63,46	100,00	-	96,00	96,00
	Average	1,96	14,78	23,11	23,11	100,00	33,33	68,66	98,66

Fig. 1. *Leptinotarsa decemlineata* Say larvae L_3 dead after Nicotox 5 treatment

The tests experimented shows that the Nicotox 5 had a very good efficiency against the egg of Colorado potato beetle (Table 2).
The product action was manifested in two ways:

- by slowing the larvae appearance or by eggs incubation blocking;
- by mortality of L1 larvae induction

The preliminary tests performed in the case of the two lactucin extracts from *C. inthybus* and *D. consolida* shows that the effect of treatments with vegetal extracts on the feeding of the larval populations of *L. decemlineata* in the field cages was typical antifeedant in all cases of experiment conditions (fresh extract in water and fresh extract in alcohol) and dry extract in water and in the alcohol compared with check plot.

Fig. 2. *Leptinotarsa decemlineata* Say larvae L_4 dead after Nicotox 5 treatment

The future research will follow two new objectives: the necessity of purifying the vegetal extract to identify the specific active substance and in finding of the possibility of product conditioning for agricultural application.

CONCLUSIONS

Nicotox 5 formulation was very active against L1 instars of Colorado potato beetle the mortality rate registered being high after 24 hours from treatment;
The tests shows that the lethal effect is predominantly of ingestion in the L3- L4 instars facing with first instars (L1- L2) where the lethal effect was especialy of contact;
The insecticide activity of Nicotox 5 is reducing with the development period of the insect stages: at the first instars the mortality rate was 100% after 12 hours from treatment when in the L3- L4 instars the mortality rate reach 80-100% after 7 days from administration;
Nicotox 5 formulation was very active against Colorado potato eggs by slowing and blocking the incubation process;
The preliminary tests performed in the field cages with two lacctucin extracts from C. intybus and D. consolida shows a predominant antifeedant effect in all experiment conditions:
Fresh extract in water;
Fresh extract in alcohol;
Dry extract in water;
Dry extract in alcohol
Further researches will be addressed to other 3 objectives:
Biosynthesis of botanical alkaloids/insecticide from plant species: *Datura innoxia, Hyoscyamus niger, Atropa belladonna, Aconitum nepellus, Solanum nigrum*;
Extraction of vegetal proteins/antifeedants; species proposed: *Cichorium intybus, Delphinium consolida, Lavandula angustifolia, Alliaria officinalis, Fumaria officinalis, F. vaillantii, Achillea millefolium*;
Extraction of volatile oils from species *Valeriana officinalis, Capsicuum anuum, Armoracia rusticana, Anethum graveolens, Petroselinum hortense, Artemisia dracunculus, Ambrosia artemisiifolia*

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THE POTENTIAL OF RURAL DEVELOPMENT OF VÂLCELELE COMMUNE, CĂLĂRAŞI COUNTY

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Abstract

The concept of development means all forms and methods of socio-economic development, and it is based on ensuring a balance between these socio-economic systems and the elements of natural capital. Călăraşi county is situated in the South-East part of the country and of the Romanian Plain, on the left shore of the Danube. It has a surface of 5088 square km and it occupies 2.1% of Romania surface. The relief is mainly represented by fields. The county depends on agriculture and economy in the rural area. In the rural area of Călăraşi county 49.1% of the total population in the country lives, most involved in agricultural activities or activities related to it. Communes are the most important category of administrative units, both numerically and in terms of population. The present paper presents aspects regarding the potential of sustainable rural development of Vâlcelele commune in Călăraşi county.

Key words**:** *commune, county, development, region, rural area*

INTRODUCTION

Călăraşi county is situated in the South-East part of the country. It has a decreasing population and a density of about 62.6 inhabitants/km, we must consider it as being mostly rural, counting 194,190 inhabitants in the rural area (59% of the total population in 2009) that represents with 21% more than the average of the countries that joined EU recently. Thus, the rural and agricultural development will form a solid pillar. The county success and prosperity depend on its own economic performances. The county is dependent on agriculture and economy in the rural area. The spread of globalization threats the traditional agriculture.

MATERIALS AND METHODS

For the presentation of Vâlcelele commune, it was processed the information taken from the Sheets of the locality, provided by the local council and information collected from the County Department of Statistics and from Călăraşi Department for Agriculture and Rural Development.
The sheets provided by the County Department of Statistics were analysed, for the elaboration of the diagnosis analysis of the commune, that included: data about commune situation and about its physical-geographical characteristics; statistics and census made at local level, in demography, labour force employment sectors, economic sector, education and culture, animal and vegetal production.
Also the SWOT analysis method was used for the commune regarding the development of the rural area.

RESULTS AND DISCUSSIONS

Vâlcelele commune is composed of Vâlcelele and Floroaica villages [1]. Situated in the North-eastern part of Călăraşi county, at a distance of 29 km Northwest of Călăraşi county, 35 km from the Danube River and 90 km from Bucharest, the village is crossed by the county road to the North-west south, crossing both villages, moving towards Cuza-Vodă commune and connects Bucharest-Constanţa highway. Bucharest-Constanţa highway, passes through the North of the village, at a distance of 4 km. The two villages of the commune are located 3 km

from each other, being separated by Floroaica Forest. To the North (7 km from Vâlcelele village and 10 km from Floroaica village) Dragoş Vodă is located, and Bucharest-Constanta railway line which in Ciulniţa, it branches to Călăraşi. Therefore, it has the advantage to be situated in a junction of means of communication, which facilitated trade links, and socio-cultural links.
The population is formed of 1,833 de persons, it can be seen a decreasing trend in the analysed period, in 2011 being with almost 15% less persons than in 1992.

Table 1. Population movement

Indicator	**2009**	**2010**	**2011**
Total population on 1st July	1806	1800	1769
Born – live	11	17	10
Deceased	32	35	41
Natural increase	-21	-18	-31
Marriage	6	8	7
Divorce	2	2	4
Born - dead	0	0	0

Vâlcelele commune lies on a surface of 6,457 ha, of which 90.6% is arable land, the rest of 9.4% is occupied by roads 4.4%, forests 2.6%, pasture and meadows 2.5%, water 1.9%, roads 1.9% and vineyards 1.3%;

Table 2. Vâlcelele commune surface

	2009	**2010**	**2011**
Agriculture surface according to its use – hectares	5,720	5,720	5,720
Arable land - ha	5,656	5,656	5,656
Surface – vineyard and vine nursery - ha	42	34	34
Surface with water and ponds – total – ha	158	158	158
Surface with constructions total - ha	179	179	179
Surface – ways of communications and railways total – ha	234	234	234
Surface with degraded and non productive land – total - ha	-	-	-
Agricultural surface – private ownership – ha	5,919	5,919	5,919
Arable surface –private ownership - ha	5,720	5,720	5,720

At the end of 2011 it had 965 houses, by 3.8% more than in 1992 and 1,7% less than in 2002;

Table 3. Surfaces grown with the main crops in Vâlcelele commune in the period 2009-2011

Surface	**UM**	**2009**	**2010**	**2011**
Surface grown with cereals	ha	2,602	2,002	2,240
Surface grown with maize berry - ha	ha	1,425	1,666	1,730
Surface grown with sun flower	ha	342	487	502
Surface grown with vegetables	ha	5	7	10
Surface grown with vineyards	ha	42	34	34

The economy, like all villages in Bărăgan area, is dominated by agriculture, the arable land provides a solid basis for obtaining various agricultural products required in industry, in food and animal feeding. Fruits and vegetables are another category of food raw materials. The subsoil is made of clay soil, at a depth of 30-50 cm, which is capable of maintaining humidity. Therefore, the vegetation is abundant and the land is fertile enough, despite the steppe climate.
Regarding the evolution of houses construction, it keeps the same trend as in the previously studied two communes, that is the period in which most houses were built is 1941-1960, with 49.6% of the total, followed by the period 1961 -1980, 20.9%.
Again we see that the period with the least constructions is the 2001-2012 and besides the possible previous explanations, we would add the increased costs of land, construction materials and lower per capita income.
In the rural area of Vâlcelele commune, there are 13 SMEs, of which 8 in agricultural sector. [2]
the most developed sector is agriculture with 8 companies in different branches of agriculture, most notably SC Ildu SRL, established in 1994, with a total number of 27 employees, specialized in the cereals crops (except rice), vegetables and oil seeds plants and SC Ilya Agro Srl, established in 1998, with 23 employees, specialized in dairy cattle;
the commerce has 3 companies, also one

company specialised on en gross commerce of cereals, sedds, fodder and non processed tabaco, Sc Dany 2004 SRL;
Service sector has 2 companies, SC Florina SRL and Sc Iliuta SRL.
In the following table I presented the evolution of the animal stock in Vâlcelele commune [3]

Table 4. The evolution of animal stock in Vâlcelele commune in the period 2009-2011

Categories	**MU**	**2009**	**2010**	**2011**
Cattle	head	1604	1115	1445
Swine	head	3376	2848	2965
Sheep	head	580	395	435
Poultry	head	10800	11720	12500

Regarding the situation of the employees in Vâlcelele commune, we have a decrease in their number between the first and last year by 12%, but we note that between 2007-2010 the number increased in 2009 being even higher with almost 73% since 2006.
The number of employees in agriculture has decreased a lot, almost 35%, while the largest variation represents the workers employed in industry and manufacturing, which at the beginning were represented by a very small number, between 2009-2010 it reached to nearly half of employees (over 400% of the first year) and at the end of the period to a value approximately equal to the reference year.
I made the SWOT to highlight the strengths, weaknesses, opportunities and threats of the studied commune.
SWOT analysis is a strategic planning method of analysis by identifying internal and external factors that may affect the proposed strategic objectives by evaluating the strengths and weaknesses of an initial reference situation.

Strengths

- people are interested in local business sector development;
- various funds can be accessed, access to which we can rely on the expertise of local staff;
- the existence of numerous companies with vegetable, livestock and agriculture services and marketing profile;
- high share of private ownership of arable land;
- possibility to use the compost in agriculture;

Weaknesses

We mention the weaknesses of the commune:
- lack of more opportunities of fun and leisure (parks and gardens);
- poor access to social services and health services;
- Poor adaptation to European standards in agriculture;
- crop diversification is little used in farms and agricultural lands are fragmented;
- lack of tourist infrastructure in the commune
- limited access to sources of information.

Opportunities

- sustainable development of the community there are various sources of funding (for economic competitiveness, rural development, environment, regional development, improve infrastructure, increase government capacity and human resource development);
- developed agricultural, vegetable, livestock and favourable natural leisure potential;
- spatial ability leisure;
- potential for organic farming;
- economic potential by selling compost or business development in the field of organic farming;
- potential for using renewable energy sources (solar, biomass and biogas);
- increased potential for projects in partnership with neighbouring communes;
- attracting potential investors;
- Potential for the development of food processing sector.

Threats

- under estimation of the rural area;
- lack of capital to support investment;
- poor utilization of the existing potential
- slow development of the rural economy;
-increasing disparities between rural communities;
- youth migration to the urban areas;
-widening discrepancies in the rural communities and their excessive depopulation;

-decrease the number of pupils, due to low birth rates, partial degradation of cultural infrastructure (community centre, library);
-the need for large and long term investments.

CONCLUSIONS

SWOT analysis highlighted as *strengths* the resources ensured by the good quality of the agricultural lands but also the activities in the livestock sector; the most important *weaknesses* of the communes consists of the poorly developed infrastructure, the lack of jobs and population aging; the main *opportunities* are represented by the respondents desire for development, the possibility to access national, intra-community subsidies and attract foreign investments; the *threats* consist of the imminent depopulation, lack of capital, lack of information that can diminish considerably the development chances;

From the above characteristics resulted the image of a community that has the desire for the development of the rural area but an aging community from demographic point of view, with poor opportunities on the labour market, but with a very high level of cooperation potential in order to achieve some common goals, including regarding the achievement of public goods.

The vision regarding the economic-social development of the rural communities in Călăraşi county is the creation and support of the competitive, stable, healthy and diversified social economic sector, to ensure the continuous economic growth and the increase of the quality of life of the commune inhabitants.

In the end we can conclude there is the need to use of agricultural resources by accessing funds destined to agriculture, ensure a high degree of rural population information regarding the existing opportunities and the requirements that must be observed in the agricultural sector, attracting young population to agricultural activities in the vegetal and livestock sector, restructuring and modernisation of the agricultural products processing and selling sectors.

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SOIL FERTILIZATION IN THE INTENSIFICATION OF LAND DEGRADATION PROCESSES FROM REPUBLIC OF MOLDOVA

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Abstract

There are provides three levels to ensure the agriculture with industrial fertilizers. The first level (minimum) is intended for a short period, until 2015 year. Application of chemical fertilizers in minimal doses ensures maximum recovery of additional production costs. The minimum fertilization system under land degradation conditions is effective both agronomic and economic. The second (moderate) is the average (approximately 2015-2020), pointing to conservation (stabilization) the effective soil fertility. The third level (optimal) provides increasing the soil fertility and obtains the high harvests and will be implemented after the 2020 year. The optimal system of fertilization meets the requirements of maintaining economic and environmental equilibrated balance of nutrients in the soil, stabilization and reproduction of soil fertility.

Key words**:** *organic and chemical fertilizers, fertilization norm, harvest, soil degradation, soil fertility*

INTRODUCTION

The current state of arable soil fertility in the intensification of the degradation processes in the last 30-40 years is unsatisfactory and on approximately 1/3 of agricultural land – critical [7]. The annual loss of uncompensated humus from agricultural land after its mineralization exceeding the 700 kg/ha and the total deficit, given the erosion losses is equal to 1100 kg/year. The main factors that conditioned the establishment of a negative balance of soil organic matter are: lack of crop rotation designed to conserve soil fertility, water erosion and using very small amounts of local organic fertilizer to fertilize the crops. In this scheme the nitric regime prevents expected harvests [5]. The content of mobile phosphates is low and approaches to natural level. In the absence of fertilizers, phosphorus system degrades gradually over 5-6 years will also become a limiting factor [3].
Failure to comply the crop rotations, reducing the amount of organic fertilizers 20-30 times, the minerals - 15-20 times, the share of perennial grasses 5-6 times led to the formation of a negative balance of humus and nutritive elements in soils and their biological degradation. Physical properties of soils determine to a large extent the level of fertility. Intensive use of agricultural land, extensive use of heavy machinery has led to worsening their quality [2].
It should be noted that in the actual conditions of soil degradation are farms with economic status that applying the moderate and optimal fertilization of main crops and obtaining adequate yields.

MATERIALS AND METHODS

When calculating the required in fertilizers have been used: statistics data in recent years, recommendations and regulations on the application of fertilizers to various crops, models of crop rotation recommended for pedoclimatic zones of Moldova.
There are calculated and provides three levels to ensure the agriculture with industrial fertilizers. The minimum level is intended for a short period, until 2015 year. Application of chemical fertilizers in minimal doses ensures maximum recovery of additional production costs. The minimum fertilization system under present conditions is effective both agronomic and economic. The moderate level

is the average for period 2015-2020, pointing to conservation the effective soil fertility. The optimal level provides increasing the soil fertility and obtains the high harvests and will be implemented after the 2020 year.

RESULTS AND DISCUSSIONS

Crop yield depends on the soil fertility and water supply conditions. In the generalized aspect the soil fertility is expressed in points (notes) of creditworthiness. Creditworthiness point is - 0.40 q/ha of winter wheat, 0.48 - maize, 0.23 - sunflower, 2.92 q/ha - sugar beet [1, 6]. Average note of creditworthiness of soil fertility in the Republic of Moldova is 63 points, which can achieve 25.6 q/ha of winter wheat, 30.7 q/ha - corn, 14.7 q/ha - sunflower. Average fertility at the administrative district level ranges from 78 to 48 note of creditworthiness. In these limits vary and yields of the main crops. Potential yield indices are close to the real ones obtained in recent years by reducing the quantities of fertilizers acute (Table 1).

Table 1. Forecast harvest of crops depending on creditworthiness note and rainfall amount

Crops	Harvest (q/ha) depending on		Difference, q/ha
	amount of precipitation	note of credit-worthiness	
North Zone: annual of rainfall, 584 mm; average note of creditworthiness - 68			
Winter wheat	48,9	27,2	21,7
Corn for grain	62,6	32,6	30,0
Sunflower	30,1	15,6	14,5
Sugar beet	367	198	169
Central Zone: annual of rainfall, 568 mm; average note of creditworthiness - 59			
Winter wheat	44,1	23,6	20,5
Corn for grain	56,5	28,3	28,2
Sunflower	27,2	13,6	13,6
Sugar beet	332	172	160
South Zone: annual of rainfall, 517 mm; average note of creditworthiness - 57			
Winter wheat	37,8	23,6	14,2
Corn for grain	48,4	28,3	20,1
Sunflower	23,3	13,6	97

Potential yields can be calculated after providing the plants with water. Coefficients of productive use of rainfall by the plants consist: in the North - 0.8, at the Center - 0.7, in the South - 0.6, from annual quantity of rainfall. The amount of water to form 1 q of the base production forms: winter wheat – 82 tons, corn – 64 tons, sunflower – 133 tons, sugar beet - 10.9 tons. According to these estimates the yields calculated by the water supply to major crops are almost 2 times higher than those caused by natural soil fertility indices [2, 3].

This shows that in the first minimum are the soil nutrient regimes, in particular the nitrogen and phosphorus. In order to obtain an increase of yields of 40-50% is required to compensate for the deficiency of nutrients through the use of fertilizers.

The minimum requirement of fertilizers application involves using only the minimum dosage of fertilizers for the main crops. It provides for the administration of the seed (the starter) of phosphorus fertilizers in doses of P_{10-20}. This process ensures a high efficiency (2-3 times) of fertilizers than by scattering. Dose of phosphorus (P_{45}) is set to vegetable crops and potatoes [1]. The use of fertilizers to these cultures ensures a high economic effect (Table 2).

Table 2. Minimum doses of mineral fertilizers for fertilizing the main crops, kg/ha, in active substance

Crops	Recommended dose			Remark
	N	P205	K20	
Winter wheat	45	20*		* *with the seeding*
Winter barley	35	10*		-*-
Spring Barley	35	10*		-*-
Maize for grains	45	10*		-*-
Sugar beet	45	20*		-*-
Sun flower	35	20*		-*-
Tobacco	15	30	30	with water at planting
Potatoes	35	45	45	-
Vegetables	45	45	45	-
Vines in bearing	30	30	30	once in 3 years
New vineyards (foundation)	-	400	400	at the unclog
New orchards (foundation)	-	400	400	at the unclog

The minimum doses (N_{35-45}) of nitrogen fertilizers are recommended to apply once as supplementary nutrition to the main crops. Potassium fertilizers are recommended only for cultures that use much potassium as vegetables, potatoes, orchards and vineyards.

According to the norms the recommended doses increase the harvest of winter wheat, barley and maize with 4-6 q/ha, sugar beet - 60-80 q/ha [1, 8].

Minimum necessary for field crops, potatoes and vegetables in the nitrogen fertilizers makes up 58.2 thousand tons in active substance. Minimum requirements for field crops in the phosphorus fertilizer reach 25 thousand tons of P_20_5 per year. This will create about 15 kg P_20_5 per average 1 ha of arable land. The indicated quantity of fertilizers will not be sufficient to achieve a neutral phosphorus balance in agriculture, but will allow to return the level of 1966-1970 years, when per 1 ha was applied $P_{15,8}$. Annual minimum requirement of potassium fertilizers for potatoes, vegetables, tobacco until 2010 year constituted 5.7 thousand tons of K_20. During this period, potassium fertilizers have not been applied to other crops, ignoring the risk of reducing the yield and soil fertility [8].

The optimal requirement of fertilizers application is designed for a higher level of agriculture (optimized crop rotation, soil conservation work, integrated plant protection, irrigation expansion, development of animal husbandry, modern technologies of plant cultivation). This system relies on associated applying organic local and industrial fertilizers, with fuller account use of the biological nitrogen. Optimal dose of fertilizer to fertilize main crops are presented in Table 3.

Table 3. Optimal doses of mineral fertilizers for fertilizing the main crops, kg/ha, in active substance

Crops	Recommended dose			Remark
	N	P_20_5	K_20	
Winter wheat	80	60	40	annual
Winter barley	34	60	0	-*-
Spring Barley	34	60	0	-*-
Maize for grains	60	50	0	-*-
Peas bean	30	20	0	-*-
Sugar beet	105	80	40	-*-
Sun flower	45	40	40	-*-
Tobacco	35	40	40	-*-
Potatoes	60	60	60	-*-
Vegetables	90	60	60	-*-
Corn for silage	40	40	0	-*-
Vines in bearing	60	60	60	once in 3 years
Orchards in bearing	60	60	60	-*-
New vineyards (foundation)	-	400	400	at the unclog
New orchards (foundation)	-	400	400	-*-

The doses are equilibrated with insurance moisture conditions, soil fertility and country economy. Recommended doses are directed towards achieving maximum profit on a unit of agricultural land.

In the typical cropping of the north zone the recommended dose of nitrogen for winter wheat is N_{90}. Sugar beet has two versions of the manure application. When using manure (50 t/ha) is recommended supplementary fertilization with mineral nitrogen N_{60}. In the absence of manure the mineral nitrogen dose increases to N_{105} (basic fertilization - N_{45} and extra fertilization - N_{60}). The doses of phosphorus fertilizer ranging: from P_{20} (in the row) for vetch and peas to P_{80} for sugar beet. Priority is given to local use of phosphorus fertilizer (the starter). Potassium fertilizers in moderate doses K_{40} are recommended for sugar beet, winter wheat, tobacco and sunflower. Annual average dose in the crop rotation consists - $N_{61}P_{50}K_{20}$. According to the regulations indicated doses increase winter wheat yield by 11.8 q/ha, corn - 9.3, sunflower - 3.8, beet sugar - to 98 q/ha.

In the Central and South zones, where in the soil cover predominant ordinary and carbonate chernozems the recommended doses of 1 ha of crop rotation corresponding to $N_{54}P_{45}K_{18}$ and $N_{47}P_{43}K_{18}$ [1, 8].

Introduction of crop rotations with leguminous crops report will allow increasing soil nitrogen reserves by 30-35 kg per year on the 1 ha of sown area from biological nitrogen account. Manure provides additional 20-25 kg/ha of nitrogen. Contribution to the formation of available soil nitrogen reserves in the country on average makes up 70-75 kg/ha. Average dose of nitrogen fertilizers recommended in agriculture is 54 kg/ha. From this dose crops used from 27 to 30 kg. Annual reserves of plant available nitrogen from all sources will be 135-140 kg/ha, the enough quantity to obtain the harvest 40-42 q/ha of winter wheat, 58 q/ha of maize, 310 q/ha - sugar beet [1].

The average dose of K_{19} fertilizer will be sufficient to stabilize the potassium content in the soils. Potassium loss compensation will be covered, mainly on account of local organic sources of fertilizers.

The optimum requirement in the industrial nitrogen fertilizer for field crops after 2020 year will consist 82.3 thousand tons of active substance or an average of 1 ha N_{55}. For potatoes and vegetable crops cultivation will require 6.8 thousand tons N, the average dose to 1 ha – N_{60}. For fertilization of fruitful orchards will require 2 thousand tons of mineral nitrogen, for fruitful vines – 1.5 thousand tons. The phosphorus fertilizer required will be 69.9 thousand tones of field crops, vegetables and potatoes – 9 tons, fruitful vineyards – 1.5 tons, fruitful orchards - 2.0 tons. The annual necessary of potassium fertilizers will be 28.3 thousand tones for field crops, 6.8 thousand tons for vegetables and potatoes, extra fertilization - 3.1 thousand tons for irrigated land (Table 4).

Table 4. The annual industrial fertilizers for optimum crop fertilization in the 2016-2020, total tons of active substance

Branch, culture	Nitrogen, N	Phosphor, P205	Potassium, K20
Crops in rotation	82,3	69,9	28,4
Potatoes	6,8	9,0	6,8
Fruitful vineyards	1,5	1,5	1,5
Fruitful orchards	2,0	2,0	2,0
New vineyards	0	2,1	2,1
New orchards	0	1,0	1,0
Extra for irrigation land	6,3	4,6	3,1
Other crops	1,0	1,0	1,0
Total for Moldova	99,9	91,1	45,9

Annual total requirement of fertilizers for agriculture of Moldova after 2020 year will be 236.7 thousand tones in active substance, including 99.9 thousand tones of nitrogen, 91 thousand tons of phosphorus and 45.8 thousand tons of potassium.

The moderate necessary of fertilizer application in agriculture will cover the period of transition from minimal to optimal system (2010-2020). To argumentation the requirement of fertilizer for this period is needs to take into account the following considerations:

- The field crops, potatoes, vegetables are fertilized with medium dose of optimum and minimum system.
- The area of fruitful orchards of 100 thousand ha will be fertilized with dose $N_{30}P_{30}K_{30}$ every 3 years.
- Surfaces of fruitful vineyards in the period 2013-2015 will be about 64.4 thousand ha, including 2.1 thousand ha in North, 33.3 thousand ha in the Centre and 29 thousand ha in the South zone. For their fertilization is provided the moderate dose $N_{45}P_{45}K_{45}$, every 3 years.
-When cleaning the ground for the establishment of vineyards (35 thousand ha) will be applied $P_{400}K_{400}$ fertilizer, the annual dose will be 2.8 thousand of P_20_5 and K_20.
- For basic fertilization of the new orchards planned on the area of 2500 ha per year will be needed by 1000 tones of P_20_5 and K_20 ($P_{400}K_{400}$).

Total needs of the agricultural sector of Moldova in the fertilizers for the period 2013-2020 will compose 191 thousand tons in the active substance, including 83.2 thousand tons of nitrogen, 65.3 thousand tons of phosphorus, 42.5 thousand tons of potassium (Table 5).

Table 5. The annual requirement of industrial fertilizers during 2010-2020 period, tons of active substance

Crops	Nitrogen, N	Phosphor, P205	Potassium, K20	Total NPK
Field crops	67,3	44,9	26,9	139,1
Potatoes and vegetable	5,6	7,0	5,8	18,4
Fruitful vineyards	1,0	1,0	1,0	3,0
Fruitful orchards	1,5	1,0	1,0	3,5
New vines	0	2,8	2,8	5,6
New orchards	0	1,0	1,0	2,0
Extra irrigation	7,87	7,1	3,5	18,4
Other crops	0,5	0,5	0,5	1,5
Total	83,2	65,3	42,5	191,0

Microfertilizer requirements are determined by the degree of assurance of soil in micronutrients and plant physiological peculiarities.

The following necessary and procedures are developed for the implementation of microfertilizers: seed and leaf treatment processing and base incorporation to soil tillage (Table 6 and 7).

At the basic tillage is using the complex fertilizers: zinc ammophos ($N_{12}P_{53-54}Zn_{0,6-0,8}$); manganese ammophos ($N_{16}P_{16}K_{17}Mn_{1,8}$); boron ammophos ($N_{17}P_{17}K_{16}B_{0,18}$); double superphosphate boron ($B_{1,5}$); molybdenum superphosphate ($Mo_{0,1-0,2}$), [2, 3].

For seed and foliar treatment processing the micro fertilizers are used in the form of salts:

$CuSO_4 \cdot 5H_20$ ($Cu_{25,5}$), $Zn\ SO_4 \cdot 7H_20$ (Zn_{25}), H_3BO_3 ($B_{98,5}$), $Na_2B_4O_7 \cdot 10\ H_20$ ($B_{11,3}$), $(NH_4)_2MoO_4$ and helats.

Table 6. Guide for the application of micro doses of fertilizers to different crops

Crop group	Trace element	Application dose:		
		seed processing, g/t of seeds	Extra nutrition, g/ha	the basic tillage, kg/ha
Cereal	B	30-80	100-150	1-3
Technical		80-130	150-200	3-6
Cereal	Mn	100-150	150-200	3-5
Technical		150-200	200-250	5-8
Cereal	Cu	30-50	500-800	1-3
Technical		50-100	300-500	3-5
Cereal	Mo	300-600	600-900	3-6
Cereal	Zn	300-500	500-1000	3-5
Technical		300-600	300-600	0,5-1,0

Table 7. Micronutrients required for the formation of primary production in the cultivation of field crops in Moldova, g/t

Crops	Trace element quantity					
	B	Mn	Cu	Mo	Zn	Co
Winter wheat	4,0	22,4	7,2	1,8	22,4	0,39
Maize for grain	5,4	42,4	5,4	1,0	17,0	0,40
Sun flower	66,3	24,8	3,8	1,0	30,4	0,68
Sugar beet	30,1	80,9	14,7	0,20	48,2	0,22

Balance of nutrients (NPK) in soils was calculated based on the soil fertilization system: minimal and optimal for North, Central and South areas. The minimum system of fertilization, with average dose in crop rotation $N_{30}P_{20}K_{15}$ kg/ha, provides a negative balance 36-38 kg/ha of nitrogen, 27-34 kg/ha of phosphorus and a negative deep balance of potassium.

Optimal fertilization system in the North zone with an average dose of 5 t/ha manure and $N_{61}P_{50}K_{20}$ ensures not only high productivity of crops, but also an almost equilibrated balance of nitrogen, positive of phosphorus (+18-19) kg/ha and negative of potassium.

In the Center the optimum fertilization system (4 t/ha manure and $N_{54}P_{45}K_{18}$ kg/ha in average per rotation), provides easy deficit balance of 26 kg/ha of nitrogen, positive (+15 kg/ha) of phosphorus and negative of potassium.

In the South to the application of 4 t/ha of manure and $N_{47}P_{43}K_{18}$ it is ensure a equilibrated balance of nitrogen (minus 10 kg/ha), and phosphorus (+4 kg/ha) and a negative balance of potassium [4, 8].

Thus, the optimal system of fertilization meets the requirements of maintaining economic and environmental equilibrated balance of nutrients in the soil, stabilization and reproduction of soil fertility.

Basic principles of the strategy to combat land degradation

The first principle is to identify problems, causes and solutions to scheduling actions needed by the cadastre, and monitoring the quality of the soil cover. The state must provide objective data to landowners on the quality status of soils parcels of privatized farms, communes. This information is required for the actions of protection, improvement and sustainable use of land through appropriate projects, the correct determination of the amount of land tax, legal traffic operations, land transactions of sale, lease, inheritance etc. The realization of this principle is possible on the improvement of the national system of pedological and agrochemical researches, detailed cartography on large scale and cyclical performance of this research across the entire land.

The second principle of the strategy, based on the information system of cadastre and land monitoring and other research, is the use of land in accordance with the concept of "ecological limits of the territory", which characterizes the limit renovation of natural resources is achieved through norms and standards adopted by law. Prerequisite - restoring the economic injury caused by the degradation of soil quality and other natural resources.

Standards and "ecological limits" established criteria that take into account spatial ecological balance, protection, improvement and sustainable use of soil, providing agricultural and forestry activities, guaranteeing their sustainability and socio-economic stability in the long term.

The third basic principle of the strategy to combat land degradation and increasing their fertility throughout the country: to implement a sustainable agricultural system. The basic objectives of sustainable agriculture are the conservation of natural resources, primarily soil fertility, plant - animal adaptation system to the environment and maintaining a high level of long-term productivity.

Implementation of measures to prevent and combat soil degradation is only possible under the patronage of the state and for the active participation of the population. Measures designed to increase soil fertility requires large investment allocation of the state, businesses and organizations dealing with issues of environment protection and sustainable development. However these measures are actions performed in the spatial organization and at the household, community, and county. In order to fulfill their need to perform pedological researches and drafted the corresponding soil projects.

CONCLUSIONS

Socio-economic development of the Republic of Moldova is possible only through long-term maintenance of agricultural and forestry production capacity of soils towards preventing and combating degradation processes. The magnitude of the current crisis in agricultural production and its interaction with macroeconomic processes requires an integrated approach to protection, moderate and sustainable land use.

In the transition conditions from driven centralized economy to the market economy, the objectives of protection, improving and sustainable use of soil cover can be made to the extent that the state will provide the necessary support for the integration of agricultural policy within a national policy for the protection of soil resources based on ecological principles. To manage land resources it is necessary to implement a permanent legal, institutional and economic mechanism to regulation of land relations. Only thus profitability of agriculture will reach a sufficient level to expand the production of agricultural products and increasing the soil fertility.

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MANAGEMENT PROMOTION FOOD EXPORTS - TERMS AND THEORETICAL REFLECTIONS

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Abstract

The main problem facing businesses today is not the scarcity of goods, but the scarcity of customers. Most entrepreneurs can produce many more goods than consumers are able to buy. This overcapacity is a result of each competitor desire to increase market share at a rate impossible and causes, in turn, extremely high. This has led to increased role in the promotion and marketing activities due to increased management attention on export promotion.

***Key words*:** *export, management, management of promotion, promotion*

INTRODUCTION

Development of the country depends on the ability to develop those areas of economic activity in the Republic of Moldova has or may have great potential for export. Moldova's economic stability and reducing it goes deep crisis which now can only be guaranteed by the existence of an effective agribusiness sector which can ensure competitiveness of local products in all markets and would therefore increase the number of labor in the production attracted and that reducing unemployment, now that would influence the final to lift the country's prosperity.

The main problem facing businesses is the scarcity of goods, but the scarcity of customers. Most entrepreneurs can produce far more goods than consumers are able to buy. This overcapacity is a result of each competitor desire to increase market share at a rate impossible and causes, in turn, extremely high. In such circumstances a special role lies export promotion management.

MATERIALS AND METHODS

Material as a basis for the research is the analysis of information obtained from specialized monographs. The main methods used in the research were: monographic method, the method of analysis and synthesis, deduction.

RESULTS AND DISCUSSIONS

Promotion, as one of the areas most empirical marketing action is expressed in "all the activities and media and attract potential buyers to the point of sale, to meet the needs and desires and hence increase economic efficiency of the enterprise production "[4].

Amplification coupon phenomenon is explained in "accelerating competition, crowding the market, supplying consumers from the excessive number of advertising communication, rendering the products and brands, the preference for short-term results, demands new forms of distribution, etc." [2], which makes product promotion, to become a major requirement, an essential factor of any sales process. As a form of communication used to inform, persuade or remind the public about the goods, image, community involvement of an organization, promotion is often decisive role in achieving the objectives. Modern market economy, no matter that the products are quality. If potential customers do not know it, is unlikely to sell. Traditionally, the promotion was intended to attract new customers. It is now important to remind

customers the benefits of their products, from their competitors and to convince this, guiding them to satisfy rational needs, buying your products. The modern promotion will stimulate, develop and guide the consumer needs.

Promote, as an expression of actions, means and methods used in orientation, information, and belief attract customers to buy the product in order to meet their needs and ensure profitability of the enterprise production is a necessity for strategic and tactical objectives of the company, for revival product life cycle, as well as to annihilate the effects of actions that lead to decreased sales.

In the literature, we find a double definition of the promotion that explains Lasségne P. [3]. This promotion is broadly synonymous with "commercial dynamics" and designates all the research that may lead to increased sales. Anglo-Saxon term "promotion" means the general purpose of promoting, which is one of the four components of the marketing mix (product, price, place, promotion). In the narrow sense, promoting the expression of specific techniques whose common features is advertising.

The essence of these characters are found in the work of Y. Castagnoli [1], which defines promotion as "a marketing practice that is adding temporary additional value product or service that offers a specific advantage buyers targeted by a targeted and measurable."

Promotion aims to overcome a sales level by capturing the attention and attract potential buyers, information, belief, building and maintaining client.

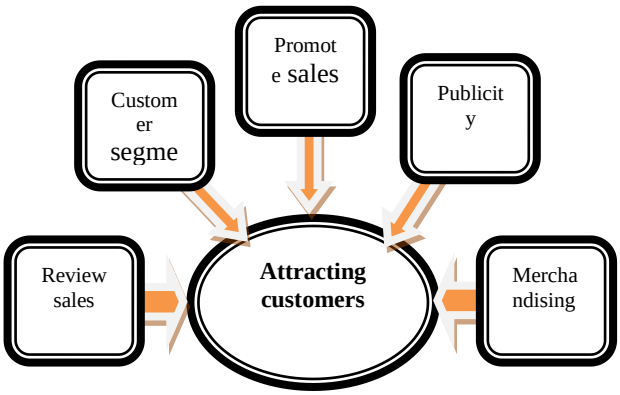

Fig. 1. Factors influencing customer acquisition
Source: developed by the author

In the figure below we highlight the main factors that influence positively attract potential customers.

Course important for any enterprise is not only attracting customers but also their maintenance. Retaining clients, in our opinion, may be performed by a number of factors.

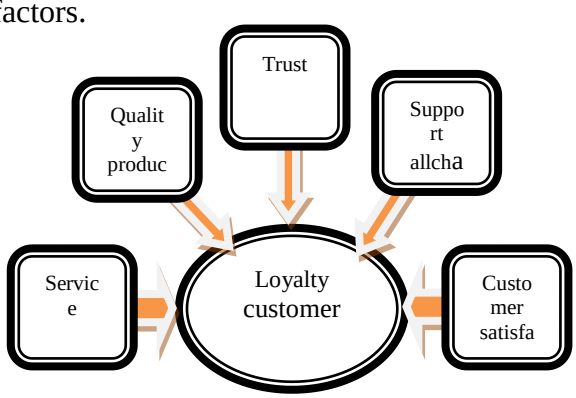

Fig. 2. Factors influencing customer loyalty
Source: developed by the author

From the figures above we can conclude that all its activities is generally oriented customers. Employees are aware that business success depends on how customer requirements are determined and understood. In order to meet current and potential customers, taking into account the interests of all parties involved in the deal.

Customer orientation is achieved by involving all departments within companies in general and marketing in particular, gives the service. Needs and consumer expectations are measured and converted into requirements communicated officers involved in achievement continue to be met by them.

Promotion activity is carried out in two main directions:

1. Promoting products - by all means and methods used in orientation, informing potential customers about new products or improved.
2. Sales promotion - the set of actions and means to capture the attention of potential comparators in order to increase sales.

Promotion is considered active when the manufacturer is the one who assumes the responsibility of promoting, directly exercised by final consumers in order to create and

stimulate preference for its product. Promote passive intermediary assumes the responsibilities of the methods and techniques we use in promotion.

Manager, with responsibilities in the field of advertising, is the one who will decide the forms, methods and techniques used, when and to what extent. He is able to define each time promotional measures to be used to achieve goals.

Lately, there is emphasis on promoting products concerns. This resulted in increasing the role of promotion in marketing activities and therefore to increased management attention to export promotion.

Among the general objectives of management to promote the export of agricultural products, the author considers the following:

1. Selecting managers, which will handle the promotion and organization of their work;
2. Determine potential markets;
3. Delimitation management methods used in the promotion of production;
4. Management of change and regulating the flow of the application;
5. Develop a strategy for customer loyalty;
6. Setting the main methods and ways to promote agricultural production;
7. Permanent monitoring of the management process to promote food exports.

The author's vision of promoting food exports management is an integrated process that empowered officials in the field, taking the basics of marketing in order to identify target markets through various promotional measures and providing superior value for customers and achieve a maximum profit.

Management of export promotion of agricultural products is not a short-term selling effort, but an effort to long-term investment.

For a company to remain on the market and to overcome competitors must move from a philosophy based on the product and sales philosophy based on a client. The key issue is to better meet customer needs. We must not believe that attracting customers is the exclusive responsibility of the marketing department as marketing is only one factor in attracting and maintaining customers. It is obvious that even the best marketing department can not sell poor quality products or who needs one.

Customers choose a product or service based on the possibilities of knowledge, mobility, income and expectations. Customer evaluates the benefits and costs of an offer compare them with others and where the offer falls short of the expected value desideratum will buy. The customer will appreciate the value provided by the difference between the total value and total cost to him of it. Customer perceived value is the difference between benefits and costs in the form of value. The total value for the customer is all the economic, functional and psychological that client expects an offer expressed as value.

The total cost for the customer is the sum of all costs that are expected to bear customer. Customers will buy from the organization that they think provides the highest value provided by. The value provided to the customer can be schematically represented as follows:

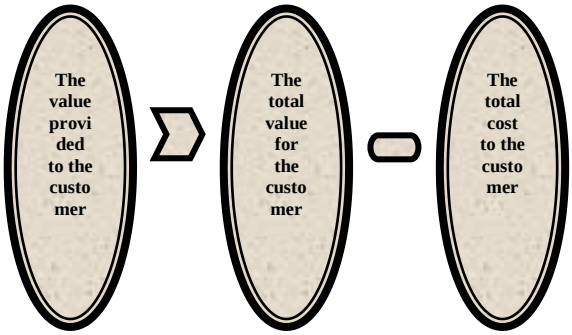

Fig. 3. The value provided to the customer's vision. Source: developed by the author

In turn, the total amount for the customer is composed of a set of items. The main product is considered that the value of the value of services, the personnel, the picture, as is shown in Fig. 4. So as it turns attract customer attention to everything from the product and to the fact it is served and is the company's image data. So in the process of market penetration, any organization should first draw attention to product quality and image, but not the quantity.

A decisive factor in the process of purchasing, customer is the cost of the product. The cost, if the customer refers not only price, but other elements as represented in Figure 5. In

addition to the monetary value to be a bear, customer attention and the time you need to use it during the procurement and use of this product.

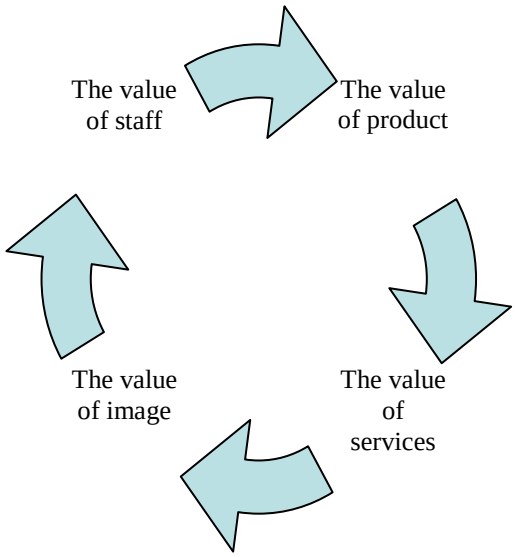

Fig. 4. Structure of total value for the customer. Source: developed by the author

Actual physical energy that will support and the pleasure will be the psychological point of view.

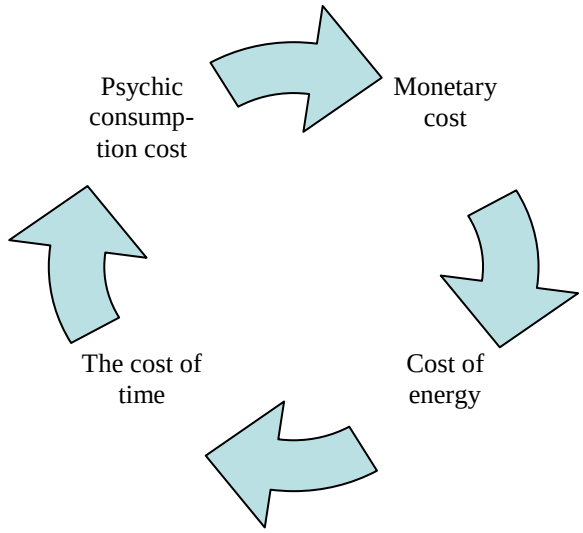

Fig. 5. The structure of total cost to the customer. Source: developed by the author

Management process to promote food exports, by author, should include the following: determining business mission, analyzing markets, setting goals market or target markets, target market selection strategy, development and implementation arrangements for the promotion of food, implementation of the strategy to promote agricultural production, promotion and evaluation efforts necessary changes.

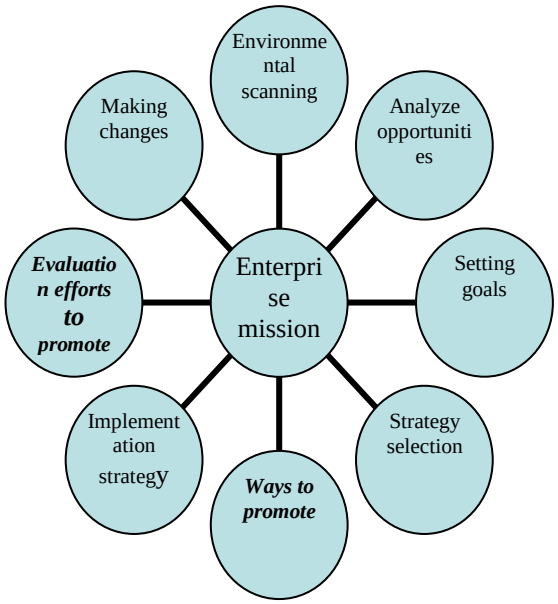

Fig. 6. The stages of the management of export promotion

The mission of the company is its long-term vision. It establishes limits within which the objectives, strategies and actions require developed. The mission answers the question: Why have the time and where we want to go?
Environmental scanning involves the collection and interpretation of information about forces, events and relationships that affect the future poor enterprise. When performing environmental scanning process is necessary to pay attention to such factors as:
1. Social factors such as social values of potential customers on food products;
2.Demographic factors such as age, location etc. of different groups of customers.;
3.Economic factors such as income, inflation, recession etc.;
4.Technological factors such as advanced communication techniques, transportation and so on;
5. Political and legal factors, such as changes in legislation, regulations to carry out the export of food products, etc.;
6.Competitive factors from both national companies and international ones.
Market opportunity analysis is a description and estimate of market size and potential for export of agricultural products for market segments of interest to the firm and competition assessment on those market segments.

The next time, in making the promotion of export of agricultural products, is setting goals. Here it is envisaged that the ultimate goal of the company and based on this setting targets. If the purpose of the company is to launch, the most attention is given to how to attack it. If the business is already on the market and wants to keep time, the goals will differ slightly. But, at any time, the company is obliged, if it is to be successful, to pay attention to such factors as: quality and price.

Selecting a specific market strategy also is an important element in the management process to promote food exports. There are three general strategies target market:

• Undifferentiated strategy (using the same methods of promotion);

• Strategy focused on a single market segment;

• Multi segment strategy (addressing multiple market segments with different marketing mixes).

Develop and implement methods to promote the export of agricultural products involves determining what you want to achieve through promotional activities. Promotion and development of agricultural production provides two main purposes, on the one hand the quantitative and the qualitative second. Draft measures to promote exports of agricultural products may include the following areas:

• Development of international economic relations of the Republic of Moldova in terms of its impact in promoting exports of food production.

• Consideration of strategic directions for promoting exports of food production.

• Addressing key recommended effective tools to promote exports.

• The rationale of the opening of representative enterprises in Moldova in CIS and EU economic effect evaluation.

• Factoring - an effective international instrument in managing external debt and food production towards export promotion.

Implementation of the strategy. Phase of management to promote the export of agricultural products which are translated into action plans implemented and to ensure that these actions are executed in a way that objectives will be achieved.

By **evaluating promotional efforts** are expected insofar as the objectives were met during a given period. Make necessary changes if necessary apply for amendment or correction of process management to promote food exports.

Overall was introduced to the essence of the role and objectives of management of export promotion. Next we try to separate the functions of management are promoting the export of agricultural products, or should they. Treatment problem management functions in the literature to this day still remains unsolved and is one of the most complicated in management theory and is now hard to come across a unique theory on the classification of positions.

The ongoing management of each cycle is carried out by the logical operations that are systematized in stages, and is content management functions. Based on the analysis above, we can determine the following general functions of management to promote the export of agricultural products:

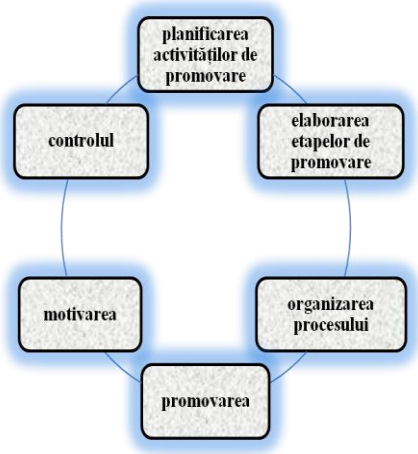

Fig. 7. Management functions to promote food exports. Source: developed by the author

The planning of activities to promote the export of agricultural products the company deals with setting goals. Determine the final exporting company wants you to and achieve. At this stage we must take into account the peculiarities of agricultural production. Develop steps to promote exports of agricultural products provides stipulation order to perform specific promotion measures.

The organization of export promotion process involves performing procedures to future research markets. Here we establish who and what will actually respond. Promotion of export of agricultural products provides practical application of the measures in previous functions. So it is considering participation in various fairs, round tables. The motivation is considering methods and procedures to motivate staff employed in carrying out the export process and potential customers. Motivating customers purchase food products intended to achieve can be done by analyzing the value systems of clients and their needs. And finally control function provides verification of planned spending to promote food exports. In case if there are any deviations when necessary corrections shall be made only in the future.

CONCLUSIONS

-The transition from totalitarian control system to a new system based on the principles of democracy and free market, boosting production and market development in many ways is based promotional activity.
-Importance increases with the policy of promoting the development of production and trade of goods on the world market, becoming the current economy, an essential and indispensable feature of foreign economic activity. This has led to increased attention on food exports promotion management.
-Maintaining market businesses largely depend on the ability of customer loyalty.
-Export promotion management process is composed of several elements. Compliance with these elements in the planning of activities to promote the export of agricultural products positively influences the development of promotional activity.
-Making management functions proposed export promotion of agricultural products will have a positive influence on exports of agricultural products.

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NEW CONTRIBUTION CONCERNING THE MASS REARING OF *TANYMECUS DILATICOLLIS* GYLL (COLEOPTERA: CURCULIONIDAE) UNDER CONTROLLED CONDITIONS

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Abstract

Controlled growth in the laboratory of some species of insect's are justified both scientifically and practically. Due to the economic importance that the corn crop pest Tanymecus dilaticollis Gyll. (Coleoptera: Curculionidae) had in Romania like the main pest of maize crops we tried to obtain successive generations under environment controlled of the insect mentioned. In this paper we aim to improve the efficiency of the multiplication of the species with respect to two aspects: attending larval and multiplication high efficiency. The coefficient value of 20, 90 obtained by us indicate a considerable increase in performance compared to previous attempts multiplication thus increasing your chances of recovery of this method of mass multiplication.

Key words**:** *maize pest,* mass rearing**,** *Tanymecus dilaticollis Gyll*

INTRODUCTION

Minimizing the losses caused by competitors for man's crops has always been as essential component of agriculture and will become increasingly important if the growing demands for food and materials created by a rapidly expanding population are be met. Crop protection was revolutionized by the introduction of modern synthetic pesticides [3], [4], [14], [16], [18]. Their subsequent extensive use has sometimes exposed limitations, stimulating increased interest in alternative methods but used properly, they remain a very flexible, powerful and often economical method of control, capable of considerable further development [5]. It is inconceivable that they will be displaced on a large scale in the predictable future and it is therefore vital that the search for better compounds and methods of application is maintained. There is scope for improvement in several directions. First, there are at present no satisfactory chemical treatments for some important damaging organisms, notably viruses, and in other cases existing treatments are barely effective enough or are on the limit of economic viability so that more potent toxicants would be an advantage. The development of resistance to both insecticides and fungicides also creates a pressing need for new active structures; at least some examples of resistance can now be found in almost all insect pest species of agricultural, veterinary or medical importance [10], [15]. In considering that facts and from an ecological standpoint, special attention will be given to various possibilities and properties contributing to increase selectivity and one of strategic direction are the mass rearing methods for industrial or semi industrial production of biological material used in the

various test pesticides need.Controlled growth in the laboratory of some species of insects is justifying both scientifically and practically. On one hand, it becomes possible to deepen the knowledge of the development cycle of the species, with all its peculiarities and on the other hand, obtaining different stages of insect creates a basis for organizing independent of the numerical experiments of natural populations of the season. Most laboratories in the world are concerned with entomological different purposes growth of harmful insects or useful (Metapa (Mexic), Waimanlao (Hawaii), Stoneville and Boll weevil research laboratory (Mississippi), Phoenix (Arizona), British Columbia (Canada), Mission (Texas) and Niles (Michigan) [1]. Due to the economic importance of the pest in our country, was tried in previous work [11], [13] to obtain successive generations of the species *Tanymecus dilaticollis* Gyll. under environment controlled conditions. This paper is an attempt to improve the efficiency of multiplication of this species based on a method developed by Paulian [12].

MATERIALS AND METHODS

The experiment was conducted in Bucharest RIDPP laboratory in greenhouse and room thermostat conditions. Biological material, i.e. individuals of *Tanymecus dilaticollis* adults, a batch of the first generation (G_1), consisting of 31 males and females was obtained in the laboratory from a lot of adults, males and females (G_0) collected from the field between 1-10.04.2012 of the experimental land Fundulea and S.C. AGRODEZ DANRO SRL, from Cornăţelu, Dâmboviţa County. Feeding adults ensure their reproduction and hatching larvae was performed by the existing method [11], [12].

To increase larval pupation and getting new adults were studied two variants:

Variant 1

Recipient: ø 8 cm plastic Sarpagan

Support: 50% + 50% sand soil

Food: root maize plants sown early experience without wetting

Variant 2

Recipient: ø 8 cm plastic Sarpagan

Support: 70% + 30% sand soil

Food: root maize plants sown in succession with the wetting.

Table 1. Major ingredients for artificial diet and quantity used for adults mass rearing

DIET INGREDIENT	Quantity kg/month	Quantity kg/year
CORNSEED MEAL	645	27,090
CORNSEED MEATS	148	6,216
PROMINE D	152	6,384
AGAR	107	4,494
SUGAR	96	4,032
CORNCOB GRITS	48	2,016
OTHER	54	2,268
TOTAL	1,250	52,500

RESULTS AND DISCUSSIONS

The design of facilities for culturing insects is, or should be, a key topic in the broader subject of insect rearing [6]. Research on insects can be facilitated in many ways if the insect species under study can be colonized and produced in the quantity needed for both basic and applied investigations. We shall consider and discuss some of the lines of research that are greatly facilitated by having the means to maintain thriving insect colonies [7]. Basic information on the life history and behaviour of insects has always served as a guide to the development and efficient application of certain types of control measures. Much has been accomplished by observing the development and behaviour of insects under field conditions. However, detailed information on the development of various stages of an insect under a wide range of field conditions is often difficult and impractical. The ability to colonize an insect makes it possible to obtain information about the biology of an insect more precisely and with less effort. Scientists are becoming more and more interested in the details of the development and behaviour of insects in their efforts to devise new ways to control them or to utilize them if they are beneficial. It may be of vital importance, for example, to have precise information on the period from the time an insect emerges as an adult until it mates or until the first eggs are deposited. The

time of mating of an insect after emergence and the frequency of mating may be significant factors in the application of the sterile insect release technique. The behaviour of insects in relation to mating stimuli, attractants in food, and other attractants is a subject of increasing interest to entomologists. Close observations and appropriate experimental procedures under laboratory conditions may be the only way to obtain the information desired [8], [9]. We might add a note of caution in the study of insect biology and behaviour. As valuable as laboratory observations may be to obtain such information, appropriate investigations should be undertaken on field populations as well. A thorough understanding of the physiology of insects is regarded by many scientists as our best hope to keep ahead of insect problems. We cannot expect to conduct the precise and complex research involved in studies of the various physiological processes in insects unless the insects under study can be colonized and investigated in the laboratory. Field-collected insects are too variable in age, nutritional condition, and general health to be employed for critical physiological studies. The greatest deterrents to the continued successful use of insecticides are the capacity of insects to develop resistance to them. Much research has been conducted to obtain basic information on the mechanisms of resistance in insects and on the genetics of the resistance factors. Obviously, such investigations cannot be undertaken with field-collected insects. So long as we must rely on insecticides as our chief weapon for insect control, we will need to continue and perhaps intensify research on the insecticide resistance problem [1], [2], [17]. The ability to colonize our major pest species will become of increasing importance to facilitate research on insecticide resistance mechanisms and how they might be overcome. The relationship of insects as vectors of plant and animal diseases is another area of study that is of vital importance. Investigators in the past made progress in this area by utilizing field-collected material, but many vital questions regarding vector-host relationships can only be answered through carefully controlled laboratory studies with insects grown under controlled conditions. The outstanding progress in the development of new insecticides, fumigants, repellents, and other insect control chemicals during the past two decades is due in large measure to the advances that have been made in our ability to colonize insects and to the parallel development of techniques for evaluating candidate insect control chemicals in the laboratory. Basic studies on the nutritional requirements of insects are of vital and increasing importance to entomology. Here again thriving laboratory colonies are essential for the conduct of research of this nature. Finally, I should like to mention the importance of the ability to rear insects of many species and diversified types in support of basic studies in the field of insect taxonomy and classification.Insect taxonomists have done a remarkable job, but they have been toiling under great handicaps for centuries because, for the most part, they have had to rely on field-collected and preserved specimens in their research on the classification of insects. This procedure will continue to be necessary and productive. However, in order to make real progress in obtaining answers to critical questions in the field of species relationships, scientists in this field must also have the facilities and the means to study living material. As applied research progresses into methods of insect control based on the behaviour of insects, the need will be increasingly great for the most reliable information possible on speciation, varieties, and strains of important species complexes. Insects from different ecological areas may show marked differences in responses to different hosts, to natural biotic agents, to each other, or to their environment in general. Until critical studies are undertaken with living material to supplement conventional taxonomic investigations, the scientists attempting to develop some of the newer approaches to insect control may encounter many serious obstacles. The ability to colonize insects of many kinds will be a necessity in order to obtain the type of information that applied entomologists will

expect from taxonomists in the future.Since some important aspects of the growth process of *Tanymecus dilaticollis* species such as the degree of adaptation to the conditions of captivity, feeding and longevity of adult female prolificacy, fertility eggs have been previous studies [11], [13] we have proposed a reference to two issues: the larval stage completion and return of multiplication.

1.The larval stage crossing

Ensure optimal conditions for the growth and development of larvae remains cardinal problem without solving which can not be determined an effective technology for increasing *Tanymecus dilaticollis* successive generations of the species. In our investigation of the total of the experience gained in 2,205 larvae and adults were obtained 523 that is a percentage of 23.71 %. This percentage is higher still existing data; the highest value in a succession of generations was 10.3 % [15]. Maintenance phase "soil" that larva in its development through presupposes a strong modification of normal environmental conditions that it is in nature, especially in the balance of physical factors: pH, salt content, moisture, etc. Being difficult to control these factors causes increased mortality of larvae during this period. Soil is, on the one hand, a powerful contamination and allows fate and action of antagonistic organisms.

In this direction it is necessary for larval life stage of soil to be removed and this is one of the issues that we propose for the future.

2.Multiplication efficiency

The multiplication coefficient from which depend the colony maintaining, expressed by the number of adults obtained from a female was substantially improved from 20.90 in the 4th generation of success (Table 2).

Table 2. Propagation efficiency of multiplication under controlled conditions of species *Tanymecus dilaticollis* Gyll.

GENERATION	1	2	3	4
TOTAL	93	20	178	232
MALES ♂	62	6	77	85
FEMALES ♀	31	14	111	147
EFFICIENCY NO. IMAGO/ FEMALE	-	6,45	12,71	20,90

Moreover, this parameter had an increasing trend over the 4 generations reflecting some progress in improving growth variants. However multiplication performance is still at a level sufficient to allow proliferation and prosperity of the colony. Analyzing the factors that influenced the successive multiplication of the insect is found:

- A female sterility 47.96% of the whole experience.

No doubt there are sterile and females in nature, due, among other factors, and malformations of ovaries and oogenesis disturbance processes. However, sterile insects reared under laboratory conditions far exceeded the phenomenon of nature without yet knowing the exact causes. If we consider the ecological offered totally different than from nature of abiotic and biotic factors, it should be noted, however, variability in the behavior of individuals. While some dams have made no clock, others in the same environmental conditions far exceeded the average values obtained in nature. For example, a number of 13 second-generation females have made much higher than the average of the 70 eggs, which is considered normal for the entire period of deposing eggs period in nature, resulting in a mean of 140 eggs. It follows that for a part of the female, provided environmental conditions have not produced an inhibition of reproductive function. Since the experience was organized in couples (♀ and ♂) can males, at least in some cases, to be that which determined the level of fecundity of females.

- Fertility eggs at a level of 43.73% on the whole experience also influenced the yield considerable of multiplication.

- In addition to some gaps in the technology used, gaps reflected in providing optimal conditions for the incubation period, it is assumed that the whole experience reduced fertility of eggs was the result of physiological disorders in genesis of eggs processes.

CONCLUSIONS

The species *Tanymecus dilaticollis* Gyll., is adapted to life in captivity, performing their entire life cycle in good condition and can

achieve high levels of prolificacy and longevity, well above the maximum considered natural conditions.

Since the differences between the two versions are used to increase larval notable unification we propose to simplify the study in a single, variant called "larval rearing method" that will aim to improve through further research.

To detect causes physiological disturbances that occur in the succession of generations requires a thorough pathological study as further developments of insect multiplication technique in an appropriate space of this technology.

The considerable increase in yield obtained by multiplying the values we as ascending obtained allow us to conclude that these values can be substantially improved growth even under natural environment for food, thus increasing your chances of recovery of the multiplication process table.

The ability to colonize insects can represent direct and indirect contributions to many aspects of entomology. The many lines of research in entomology that are facilitated by the availability of thriving insect colonies have been discussed in this introductory chapter. The possibility of controlling insects directly by utilizing the insects themselves or by utilizing products derived from insects may be of equal value to the science of entomology. Insects in large numbers may be needed in the future to control insects by releasing sterile insects, by using caged insects to attract and destroy their own kind, for the production and use of attractants, for the production and use of insects pathogens, insect parasites, and predators, or for producing growth-regulating substances for insect control.

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ANTHONOMUS RUBI (HERBST, 1795) (COLEOPTERA: CURCULIONIDAE) A NEW DANGEROUS PEST IN THE ECOLOGICAL CROPS OF STRAWBERRY IN THE SOUTHERN REGIONS OF ROMANIA

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Abstract

In Romania mostly of 70% of strawberry ecological plantations were cultivated with specific commercial cultivars like Premial, Red Gauntlet, Dana and Elsanta. In the last years became to be cropped cultivars with increased resistance to various pest insects, specially in the first stages of vegetation period like Honeoye, Elsanta, Camorosa, Marmolada, Chandler, Darselect, Clery and Sonata. On the little individual farms with small surfaces the cultivars Senga Sengana, Marmolada, Elsinore should be the primary source of infestation with Anthonomus rubi.A study of distribution, density and the degree attack of Anthonomus rubi was carried out in the period 2006-2007 in the Vidra and Comana localities, Giurgiu district in the southern part of Romania. The study and observations that was made showed that this species is increased in density in the new ecological plantations of strawberry from some individual farms. The strawberry blossom weevil is not a common pest of strawberry plantations in Romania but some cultivars cropped in ecological system became more sensitive to the weevil attack by increasing in density. Observations and researches were carried out on 4 cultivars and showed that the degree of damage caused by A. rubi depends of cultivar morphological characteristics (small fruits) or phenophases (time of ripening and duration of budding and blossoming).

Key words**:** *Curculionidae, ecological crops, new pest, strawberry blossom weevil*

INTRODUCTION

One of the most important aspects of the plant protection domain related to the ecological crops is determined of the two factors: climate change which is combining a multitude of drivers and the existent local biodiversity. In the new conditions created by a multistage combination of such a drivers some of the species belonging to the local, common biodiversity became by enhancing their biological activity the main factors to crop reduction [9] [4] [2]. This phenomenon is usually named the appearance of the new emergent species. Local attacks enhancing in the Southern Romania of a new important strawberry pest *A. rubi* is caused ones more by the proliferation of little individual farms which are cultivate different strawberry cultivars in ecological crops. The strawberry blossom weevil is a little insect belonging taxonomically of weevils (Curculionidae family) that feeds of some Rosaceae species and is considered in such special cases like an common and important pest of strawberry and raspberry (*Rubus idaeus* L.) in Eurasia. This insect is particularly problematic pest of strawberry in Europe, in some cases responsible for up to 80% loss of fruits crop [6]. Adults feed on strawberry foliage, and females lay one egg per flower bud, the larvae hatching and develop inside the buds. In

Romania in the treated strawberry crops using chemical pesticides the insect were not caused any crop losses up to the treshold because of the low densities involved and the very low pesticide resistance of the insect. After the large scale introduction of ecological crops (in the free field or in greenhouses) the rapidly increase of insect populations densities and wide spreading had appear [7] [11].In the present paper field studies were conducted to examine the relationships between population dynamics of adult of strawberry blossom weevil and to establish economic injury levels at the highest densities.

MATERIALS AND METHODS

The strawberry plants observed in the course of the 2011-2012 study were for resistance testing against *Anthonomus rubi* attack at four cultivars. Each variety was represented by 10 plants planted in variation rows and treated in compliance with conventional agro technical methods. Resistance was measured in percent isolating 10 model plants by economic injury estimation. Data are analyzed by an appropriate variation – statistical method. Adult weevils were sampled weekly in untreated and insecticide-treated plots using a sweep net.

RESULTS AND DISCUSSIONS

Description

Adult is 2 to 4 mm long, dull black covered with a fine grey pubescence (Fig.1). Rostrum long and slightly curved. Antennae slender, inserted in the third terminal of the rostrum. Pronotum white, with a fine and very dense punctuation. Elytra short, with marked stripes.
Eggs are white, smooth, shiny, slightly oval, 0.50 x 0.35 mm.
Larva: 3.0 to 3.5 mm long, curved, white; head brown.
Biology
Host plants in Romania: raspberry, strawberry, bramble (*Rubus*), rose (*Rosa*) and wild rose (*Rosa canina*).
Imago: directly after its emergence, it feeds a few days on the young leaves and the corollas then enters diapause, sheltered under bark or in various other situations. It emerges in spring, feeds for a few days and mates. Oviposition occurs immediately after mating: with its rostrum, the female bores through the unopened flower bud; then turns round and introduces an egg in the centre of the floral tissue, on the young anthers or the stamens. It then incises the flower stalk, thus preventing sap circulation. Egg: Embryonic development lasts 5 to 6 days.
Larva: growth lasts 18 to 22 days. Pupation occurs in the bud and adults emerge 8 days later, having perforated the bud.

Fig. 1. *Anthonomus rubi* Herbst., sexual dimorphism (♂♀)

Life cycle

One generation per year. The young adults appear in the late spring and then; after a few days of activity, enter into summer-winter diapauses and reappear in the following spring.

Damage

Strawberry is the main host, and suffers from the very characteristic attacks of this insect: flower bud containing an egg does not develop but dries up, hangs on the peduncle and finally drops off. The damages caused to strawberry by *Anthonomus rubi* varied depending on several factors: morphological characteristics of cultivars, agrotechnical equipment and weather conditions during the period of laying eggs [6]. In the opinion of some authors small fruits yield losses per year are quite considerable, varying from 15% to 60% [1] [5]. More important damages are reported from Scandinavia and some Northern

European countries. For example in Denmark the yield losses are bigger up to 80% [8] [10].Field experiments showed that increasing the release rate by approximately five times marginally increased attractiveness but a four times reduction in the release rate significantly decreased attractiveness. It was concluded that the standard release rate was satisfactory. Male *A. rubi* weevils were shown to produce the R enantiomer of lavandulol, but it was also demonstrated that the S enantiomer is not repellent and that low-cost racemic (±)-lavandulol is equally attractive. Although (−)-germacrene-D showed a weak synergistic effect when added to the pheromone components, inclusion in a commercial lure was uneconomic. Two further experiments examined the effect of reducing the amount of grandlure I, a costly chemical, in the blend [3].In Romania, in the period of investigations the weather related to the vegetation period and strawberry ripening was very dry and favourable for pest attack. The degree of resistance to the pest attack was negative correlated with the quality of production. The Premial cultivar seems to be more tolerant to the pest attack and the yield of good quality was not affected (Table 1).

Table 1. The main strawberry cultivars tested which express different resistance degree against *Anthonomus rubi* Herbst. in the experimental field at Vidra Experimental Agricultural Station – Giurgiu district

Cultivar	ORIGIN	RESISTANCE DEGREE	PRODUCTION
Premial	Romania, RDIP	Medium degree of pest resistance	High production; high quality
Redgauntlet	UK	High resistance against pest attack	High production but perishable
Cardinal	USA	Small degree of pest resistance	High production and fruit quality
Marmolada	Italy	Small degree of pest resistance	High production and fruit quality
Pandora	Italy	High resistance against pest attack	High production but perishable

The imported cultivar expresses different degree of resistance to pest attack, two of them Redgauntlet from UK and Pandora from Italy had High resistance against pest attack correlated with high production but the fruits are very perisable. On the opposite the cultivars Cardinal from USA and Marmolada from Italy had a small degree of resistance but high production and fruit quality. The attack of the pest was thus correlated with the resistance or tolerance presented by the different cultivars tested in the specific weather conditions. Very little tolerance of the *Anthonomus rubi* attack was presented by cultivars Pandora and Redgauntlet instead Marmolada and Cardinal was small resistant to the insect attack (Table 2).

Table 2. Attack degree of strawberry blossom weevil *Anthonomus rubi* damaging on four cultivars in the Southern Romania at Băneasa Giurgiu Agricultural Station

CULTIVAR	ATTACK DEGREE %	LEAVES	BUDS
Redgauntlet	8.10±0.99	4.30	2.70
Cardinal	10.30±0.75	1.90	14.10
Marmolada	18.40±0.88	4.87	16.60
Pandora	6.70±0.78	1.40	5.70

CONCLUSIONS

In the weather conditions from Southern Romania (driest and warm conditions) *Anthonomus rubi* could be considered the new emerged pest of strawberry ecological crops.
The degree of resistance to the pest attack was negative correlated with the quality of production.
The Premial cultivar was more tolerant to the pest attack and the yield of good quality was not affected.
The imported cultivar expresses different degree of resistance to pest attack, two of them Redgauntlet from UK and Pandora from Italy had High resistance against pest attack correlated with high production but the fruits are very perisable.
The cultivars Cardinal from USA and Marmolada from Italy had a small degree of resistance but high production and fruit quality.

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ECONOMIC SUSTAINABILITY

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Abstract

This article aims to highlight the quality of life that depends on necessary, harmonious and simultaneous satisfying of all human needs, instead of „one at a time", health and economic insecurity being at the very foundation of it.
A society that is focused on quality of life will be a society centered on the individual, their needs and aspirations. It needs to offer alternatives and choices of the individual and not to impose models. Coercion of society over the individual is an objective and necessary phenomenon. Its deepening is not, however, as required. Social environment based on quality of life must be characterized by the maximum possible degree of permissiveness in which the individual is educated in its contribution to social awareness.

Key words**:** *economic growth, human needs, macroeconomic stability, social disparity*

INTRODUCTION

There is more to life than material wealth. Humanity would be really low if everything we've struggle would reduce to the material side. My study started from this idea in an attempt to outline and measure adequately the quality of life. Material prosperity may not represent everything that people are satisfied with their life style, which requires broader, deeper assessments of the problems of human life.
Quality of life is its value for human life, manner and extent that human life offers the opportunity to meet its numerous needs, the extent to which life is satisfactory.

MATERIALS AND METHODS

The paper was carried out based on a deep documentation on life quality attributes and specific indicators to estimate it.
This is a critical review of the findings and present a specific approach using the analysis and synthetic deduction methods.

RESULTS AND DISCUSSIONS

Research on quality of life has identified a wide range of attributes such as belonging, accomplishment, image, autonomy, feelings and attitudes of others. Many of these attributes are intangible and difficult to evaluate.
Given the complexity of the quality of life, its measurement requires consideration of a multidimensional array of indicators. The first indicator of our study is human health.
Health is the most fundamental component of capabilities, because without life, lacking any of the other ingredients does not value anything [1].
Therefore, national and international organizations provide a variety of health indicators. A large set of individual indicators is concerned with mortality, such as average life expectancy and life expectancy at birth, while many other indicators capture aspects of morbidity. Morbidity indicators include information on the prevalence of various diseases, self-reported measures of health and anthropometric measures of height and weight. Specific indicators, such as infant mortality, life expectancy for different age groups, the mortality rate due to certain chronic diseases, the prevalence of obesity and smoking, the number of serious work accidents regularly provides essential information for experts. However, data are too focused on unique conditions or population groups [2].

Indicators do not take into account any negative effect on a disease or disability could have on quality of life. To avoid these problems, indicators relating to health conditions, mortality, and morbidity should be combined into a single indicator.

A number of indicators have been suggested in recent years. For example, many relevant issues can be drawn from the designed "disability-free life expectancy".

The HLY "Healthy Life Years" is based on a person's remaining years of a certain age who expects to live without disability (see figure 1). This indicator combines information on infant mortality, disability, and life expectancy of adults, all together: healthy life years that a newborn is expected to live, given the prevailing conditions.

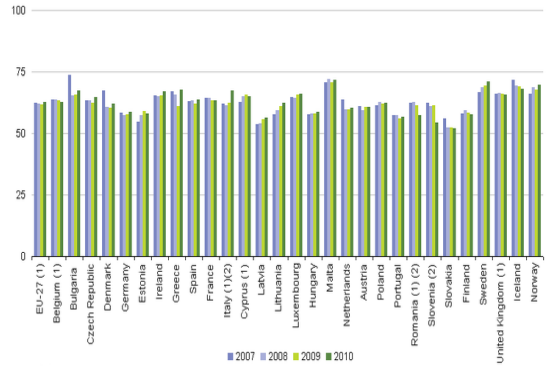
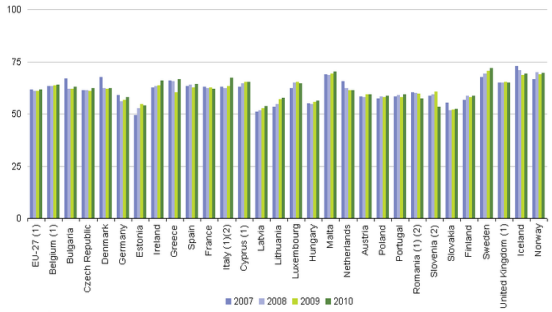


Fig. 1. HLY- Healthy life years at birth, women, 2007-2010 Source: www.eurostat.ro

In 2010, the number of healthy life years at birth was provisionally estimated at 61.7 years for men and 62.6 years for women in the EU-27, accounting for approximately 80% and 76% of total life expectancy at birth for men and women. For survivors at age 65, the number of remaining years of healthy life was approximately 8.7 years for men and 8.8 years for women [3].

In six Member States (Denmark, Spain, Italy, the Netherlands, Portugal and Sweden), men (from birth) could expect to live longer without disabilities than women. In Bulgaria, Estonia, Lithuania and Poland, the gender gap in recent years of healthy life at birth was about four years for women (see Figure 2).

Non-monetary aspects of health may deviate significantly from conventional economic measurements. For example in France, although it has a lower per capita GDP than the United States, life expectancy at birth is higher (see Figure 3).



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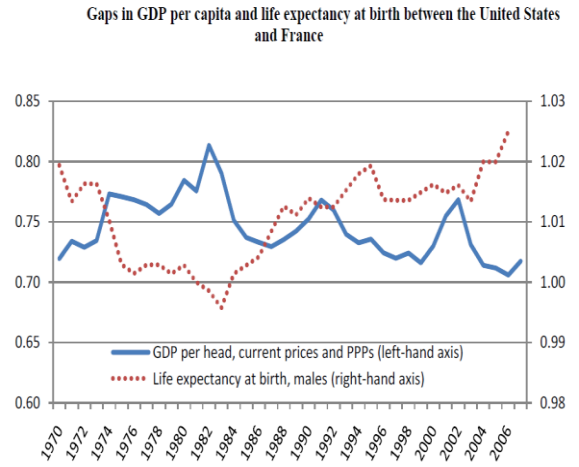

Fig. 3. Gaps in GDP per capita and life expectancy at birth between the United States and France
Sursa: www.oecd.org

There are inequalities in health status between countries. However modern research revealed several patterns. For example, people with less education and income tend to die younger.

Moreover, these differences in health conditions do not reflect bad results only for those at the bottom of the socioeconomic ladder, but also extends to the entire socio - economic hierarchy. For example, life expectancy in the United Kingdom increases when moving from unskilled to skilled workers, from handcrafting to non-manual workers, entry-level office employees to senior employees. In European countries, mortality rates for less educated people are about 50 % higher than those with higher education, with a lower difference for women

than men and elderly compared to younger individuals. These inequalities are not reduced consistently over time, they even exacerbating in some countries.

Although these models have obvious relevance in Assessment of quality of life in many countries, the systematic collection of data in this area remains weak. It is possible, for example, to compare the size of these health inequalities between countries in the same way that income is conventional. This is because individual characteristics (education, income, ethnicity) and geographic reference population.

Improving the measurement of health inequalities, especially in reducing the gap between the results on the health and socio-economic status, should be recognized as a priority for statistical activities in the coming years [4].

Uncertainty about the material conditions that may prevail in the future also reflects a variety of risks, especially for unemployment, sickness and age limit that induce economic insecurity. Achieving these risks has negative consequences for quality of life, depending on the severity of the shock, its duration, the stigma associated with it, the risk aversion of each person, and the financial implications [5].

Unemployment is recurrent or persistent, when unemployment is low income relative to previous earnings, or where workers have to accept major cuts in pay, hours or both to find a new job. The consequences of job insecurity are both immediate (income replacement is usually lower than earnings from work earlier) and longer term (due to potential losses in wages when the person does not find another job). While the consequences of these indicators are available, comparisons between countries are difficult, requiring special investment in this direction. Job insecurity can also be measured by asking workers either further evaluate the security of their current job, either the expectations of losing their job in the near future. Fear of job loss can have negative consequences for the quality of life of workers (e.g. physical and psychological ailments, tensions in family life) and for companies (e.g. negative effects on the productivity of workers and a smaller identification with corporate objectives) and society as a whole.

The global economic crisis has seriously affected the labor market in the European Union, leaving more than 23 million unemployed people have little hope to find a job. Only in the last year and a half have lost 4.3 million jobs, representing 1.9 percent of total employment across the EU (see figure 4).

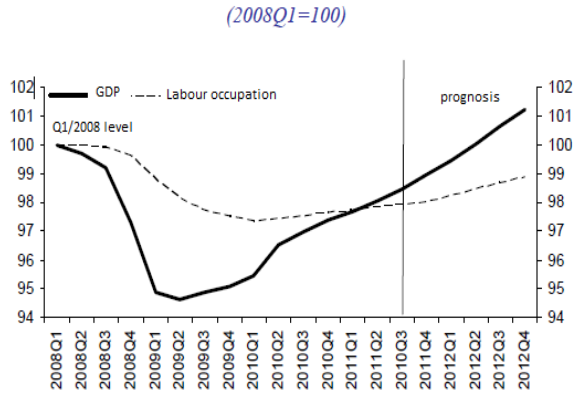

Fig. 4. GDP and labor occupation in the EU
Sources: Eurostat, ECFIN autumn prognosis

In this context, it is noted that unemployment in EU countries has reached an average of 9% and remained at this level until 2012 (see figure 5).

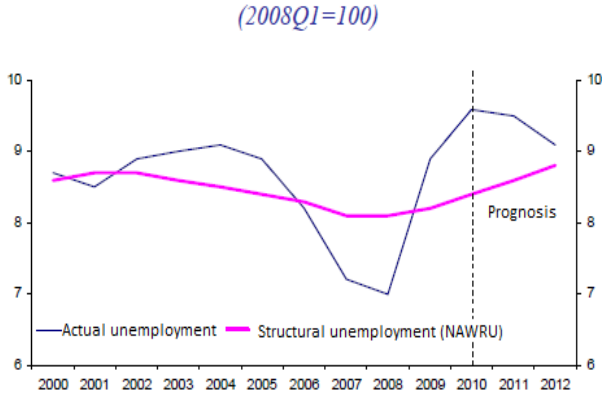

Fig. 5. Actual and structural unemployment rates in EU-27, Source: www.eurostat.ro

For people with no health insurance (or only partial), medical costs can be devastating, forcing them into debt, to sell the house and property or to stop treatment with worse health outcomes in the future. An indicator of economic insecurity is provided by the share

of people without health insurance. However, even the insured persons may have to bear a large part of health spending from their own pocket. For these health expenses should be added the revenue decline that occurs if the person must stop working or when this insurance does not provide replacement income.

Age is not a risk in itself, but it may involve further economic uncertainty due to the uncertainty about the needs and resources after withdrawal from the labor market. Two types of risks, in particular, are important. The first is the risk of inadequate resources in retirement due to insufficient future pension payments or higher needs associated with diseases or disabilities. The second is the risk of volatility in pension payments: While pension schemes are exposed to certain types of risks, the most important role of the private sector to finance pensions for older age made possible expansion of pension coverage in many countries.

CONCLUSIONS

Quality of life depends on the people, objects and opportunities. Measures should be taken to improve health and social insecurity.

Information relevant for assessing the quality of people's lives goes beyond self-report measures including population and perceptions regarding the existence and freedoms. While the exact list of these features inevitably rely on judging the value, there is general consensus that quality of life depends on the health of people and economic insecurity, participation in the political process, social and natural environment in which they live. The measurement of these features requires both objective and subjective data. The challenge in all these areas is to improve what has already been achieved, identify gaps in the information available to invest in statistical capacity in areas (such as time of use), if available indicators remain weak.

Indicators of quality of life in all sizes to cover should assess inequalities in a comprehensive manner.

Inequalities in human conditions are integral to any assessment of quality of life between countries and how it develops over time. Each dimension of quality of life requires appropriate measures of inequality, each of these measures are meaningful in it and does not require absolute priority over others. Inequalities among people should be assessed, socioeconomic groups and generations, with special attention to inequalities that have emerged recently, such as those related to immigration.

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ANALYSIS OF CABBAGE CROP TECHNOLOGY

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Abstract

The purpose of this project is to show the classical technology of cabbage production, technology which is used in the farm. This technology is focusing on the preparation of the land, the maintenance of the culture, preparing the seedlings, the costs of the production, the medium production of an ha and the price of selling between 2005-2012. If this technology, the accomplishments can be the following: a comparing analysis between the price and production with the help of the statistical indicators.

Key words**:** *crop technology, evolution, grade cabbage, production*

INTRODUCTION

Cabbage is a biennial plant: in the first year is vegetating and in the second one it blooms. It is part of the Cruciferous family and has this name because has the 4^{th} tip of flower, with its flower elements in the cross shape. The flowers are categorized in yellow blossom.
Cabbage is the species with reduced requirements when compared with climatic factors. To obtain qualitative and quantitative big productions, cabbage requires an optimal temperature of vegetation of 15-16 degrees. The young plants can resist till 5-6 degrees, and the mature plans to 10-12 temperature degrees. The process of germination of seeds starts at 3-4 Celsius degrees, but the optimal temperature is 10-12 Celsius degrees.

MATERIALS AND METHODS

A framework technology has been used in the own farm. There have been used fertilizers for the technological process. Bucharest variety used is a sort of summer / autumn, with a high resistance to heat and cracking.
An comparative analysis has been made between the average production for 1 ha in exploration and in Dambovita county, as well as a average between the production in holding and the selling price in 2005-2012, these evolutions and correlation between production and price.
When it comes to calculation methods, it has been used arithmetic average and correlation coefficient.
Given that statistical study of mass phenomena in terms of statistical laws that govern them, which are characterized by the form of trend known and verified only at the aggregate level, it must naturally mass analysis of the links between the phenomena studied by all statistical trends as causal relations.
It is known that in the scientific, technical and natural sciences, an important place in the study of causal links where one or more phenomena uniquely determine the change of another phenomenon. In this case it is a relation of the functional form: $y = f(x)$, where x, y are real variables or vector.
The particularity of this type of connection is that a characteristic X–called feature independent factor(or exogenous cause) exercise some influence over another feature Y, called resultant feature dependent (endogenous or effect).
In statistics relations, a value of characteristic X factor corresponds to a distribution of values resulting features Y because Y dependent feature an influence on other factors (characteristics) that in terms of the

relationship between X and Y considered casual (regression and correlation, article).
For example, if the price of the product is dependent studies cabbage Y, and the average production per hectare achieved X, we will have a single bond, if the selling price is based on studies of average production per hectare.
The correlation coefficient measures the adequacy of a function relative to the actual values studied[6].

RESULTS AND DISCUSSIONS

The significance of the culture

The skull that is being consumed during the entire year represents the edible portand it can be ate as a fresh plant, sauerkraut, freezes, dehydrated or preserved. The cabbage's value is given by the high content of carbohydrates, mineral salts and vitamins, that are entirely used by the human body.[3]

Early green crops culture

Preparing the land

It's starts in autumn with an John Deere, at a 30-35 cm depth.
In spring starting with March, is given litter with a specific degree, where for 1 ha it's needed 15-20 tones and after that the land is being unlocked. The billon of the rows is part of preparing the land.
Fertilization with manure: NPK- 200 kg/ha
Sprayers: Stomp 2.4l/ha
Spread drip and sprinkler: for 1 ha -6000m drip necessary.

Seedling production

It has to start at the beginning of February.
To begin with fertilizer is fitting biological growth rooms: manure and straw, peat, organic manure.
It arranged shelter where fermented manure with straw where sitting in hot, then looks and then apply a thin layer of sand.
For 1ha of land it is necessary to produce 40000 of plants.
After 10-15 days from seedling emergence sub culturing in the alveoli.
The alveoli are being filled with peat and organic manure mixture. For 40,000 plants it is needed around 800 pieces. The depth of transplants is almost 2-2.5 cm.
At the begging when the seedlings are small and rare needs to be wet with water because dry soil only at the surface.
It is very important to make hardening seedling with 2-3 weeks before the full discovery on sunny days and nights frost.

Crop Establishment and Maintenance

Planting seedlings should be made in April when the soil temperature riches 8 degrees Celsius and in the next 2-3 days it is not expecting to frost.
The seedlings are being planted at a distance of 25-30 cm plant/row.
Irrigation is made when necessary, depending on temperature or if drought or not. For 1 ha of land, irrigation is done for 5 hours.
First weeding is made at 20 days after planting and weeding is made at 2-3 days manually. The ammonium nitrate administrated at 200 kg ha then irrigate. In total there are about 2-3 of mechanical cultivation and two manually. After breeding II is administered urea, about 150-200 kg / ha as ammonium nitrate, then walk sprinkler irrigation or flooding at the beginning of the formation of skull. It is used atomic which is also a foliar fertilizer faze about 300 ml / ha, 2-4 weeks after the planting. For pests uses as insecticide-DiazolMerpan or 200 ml / ha[1][2].

Table 1.

Year	Yield Kg/ha	Sale price Lei/kg	Production value Lei
2005	86,000	1.8	154,800
2006	82,000	0.4	32,800
2007	98,000	1.2	117,600
2008	79,000	0.8	63,200
2009	103,000	1.2	123,600
2010	97,000	1.5	145,500
2011	87,000	0.7	60,900
2012	102,000	2	204,000
Average	91,750	1.2	112,800

Source: Own calculation by data at farm level

In the table above we see the average production per hectare on the farm and the sale price of 2005-2012[4].

The largest proctor was made in 2009 and far lower in 2009 and the average of those eight years is 91750 kg / ha. The largest price recounted in 2012, is 2 lei, but when making an average between the highest price (2lei) and lowest price (0.4 lei) the price is actually 1.2 lei.[5]

Table 2. Correlation coefficient between production and sale price

Year	Production	f(x) (Lei)	F(x) (Lei)
2005	86,000	1.8	1.06
2006	82,000	0.4	0.84
2007	98,000	1.2	1.46
2008	79,000	0.8	0.65
2009	103,000	1.2	1.52
2010	97,000	1.5	1.45
2011	87,000	0.7	1.11
2012	102,000	2	1.51

Source: Own calculation by data at farm level

Equation was obtained:
$Y(lei/kg)=-13.062+ 0.000278679X - 1.33102E-09X^{2:}$
which has a ratio of correlation of0.6416*, is significant for a probability of 90% and a 10% risk.
The highest production in exploited and the county is found in a comparative analysis in 2009. Making an comparative analysis in Dâmbovita county, we see that the production of the farm throughout the years studied, exceeds the county level at a rate of approximately 350%.

Tabel 3. Comparison between farm production and average production at county level

Year	Farm production kg	County average production kg	Farm prod./ County prod.(%)
2005	86,000	23,497	366.0
2006	82,000	26,625	308.0
2007	98,000	21,279	460.5
2008	79,000	21,733	363.5
2009	103,000	28,786	357.8
2010	97,000	26,985	359.5
2011	87,000	27,985	310.9

Source: Own calculation by data at farm level studied

Following the data from Table 4, we see that the level of production, compared with the years 2005 and 2009, actually reached the maximum level, exceeding production by 19.8%. After implementing the technological process in 2012, we achieved a production of 102,000 kg / ha, production which has been harnessed by Lei 2/ kg. Lowering the production costs amounting to Lei 13,438.4/ ha, we obtained a profit of Lei 190,562/ha. We concluded that the technology is very good considering the average production obtained, and the profit from this year.

Table 4. Evolution of cabbage yield and selling price

Year	Prod. kg/ha	2005=100	Price of sale Lei/ kg	2005=100	Value of prod. Lei	2005 =100
2005	86,000	100	1.8	100	154,800	100
2006	82,000	95.3	0.4	22.2	32,800	21.2
2007	98,000	114.0	1.2	66.7	117,600	76.0
2008	79,000	91.9	0.8	44.4	63,200	40.8
2009	103,000	119.8	1.2	66.7	123,600	79.8
2010	97,000	112.8	1.5	83.3	145,500	94.0
2011	87,000	101.2	0.7	38.9	60,900	39.3
2012	102,000	118.6	2	111.1	204,000	131.8

Source: Own calculation by data at farm level

CONCLUSIONS

-Cabbage is a biennial plant generally a species with reduced requirements from climatic factors.
-Establishment culture begins when the soil temperature is recorded at 8 degrees Celsius.
-Young plants can withstand 5-6 degrees Celsius, while mature plants 10 to 12 degrees Celsius.
-Using this technology we obtained an average production per hectare in the last 8 years on average 91,750 kg
-Variety of cabbage used reach a weight of 3-4 kg
-Favorable production costs and make profit, a cost of Lei 13,438.4.

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CONSIDERATIONS ON THE MAIN FEATURES OF THE AGRICULTURAL POPULATION IN THE EUROPEAN UNION

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Abstract

The paper aimed to analyze the EU-27 population by means of the following indicators: population structure by origin, age, gender, training level, income in member states, emphasizing Romania's position among other countries. In the EU-27 there large differences regarding rural and agricultural population.The main trend is the reduction of agricultural population, but there are countries where it is increasing and states where it is declining. Despite at EU level 5 % of its 504 million inhabitants are working in agriculture, there are states with a higher percentage of agricultural workforce and also with a lower labor percentage. Rural population aging and decreasing number, migration to cities, relatively low training level, gender discrepances from a country to another, low income per annual working income mainly in the 12 countries which joined the EU in 2004 and 2007 below the EU average income are the major features of the EU-27 agricultural labor. Romania has the highest agricultural population working in small sized farms and the lowest income per farmer below Euro 2,000. The gap beween the EU and Romania could be diminished by training, high technologies, implementation of associative forms in agriculture destined to grow up productivity and competitiveness.

Key words**:** *agriculture, characteristics, European Union, labor force*

INTRODUCTION

The development of agriculture is highly conditioned by labor force. The number of people working in agriculture, their training level, practical and managerial skills are the key factors which could contribute to agriculture development in the future.

The existing gap between the availability of jobs and the supply of graduates is an important barrier which could affect agricultural labor force in the coming years [6].

Working people in the EU agriculture is different from a state to another regarding age structure, training level, productivity, income and living standard [7, 16].

In this context, it is considered important to analyze what is happening with labor force dealing with agriculture, which is the actual statement and which are the major trends with a deep impact on the future development of agriculture.

MATERIALS AND METHODS

The documentation is based on the European Commission Reports and Eurostat data base and refers mainly to the year 2011, but also to figures recorded in the previous years, used as a comparison reference term.

The opinion expressed in the text belongs to the author and also the paper present other authors' opinion on the same topic, a reason to establish similarities or differences in the subject approached.

The following aspects have been approached: EU population and its distribution by member states, population by living area, population growth rate, population in agriculture by EU member states, origin, age, gender and education level, income by annual working unit (AWU) in agriculture and by farm size.

RESULTS AND DISCUSSIONS

EU population accounted for 502,4 million people on 1 January 2011, 503,7 million people in January 2012 and 504.5 million

people in 2013 including Croatia's population, the last country which joined the EU in July 2013. In 2012 the EU-27 population was by 1.3 million persons higher than in 2011. Compared to the year 1960, when its population was just 402,6 million persons, it registered a substantial increase by the year 2012. [9]

The EU population increased by 0,25 % in 2012 compared to the year 2011. The highest gains were recorded in Germany, United Kingdom, France, Italy, but also in the Netherlands, Spain, Belgium and Sweden. The deep decrease of the population was registered in Romania, Bulgaria, Lithuania, Latvia, Portugal, Hungary, Greece, not only due to the low birth rate but mainly to migration.

Distribution of the EU population by member states. Four EU states have more than 54 % of the EU population as follows: Germany 81.8 million inhabitants, France 65,3 million people, United Kingdom 62.9 million and Italy 60,8 million, all together accounting for 270,8 million persons.

Table 1. EU-28 Population and GDP/capita in terms of PPS in 2012

Country	Population	Share of the EU-27(%)	GDP/capita in term of PPS*, 2012	Country	Population	Share of the EU-27(%)	GDP/capita in term of PPS*, 2012
Malta	421,364	0.08	86	Hungary	9,908,798	1.95	66
Luxembourg	537,039	0.10	272	Portugal	10,487,289	2.06	78
Cyprus	865,878	0.17	95	Czech Rep.	10,516,125	2.07	80
Estonia	1,324,814	0.26	67	Greece	11,062,508	2.18	79
Latvia	2,023,825	0.39	59	Belgium	11,161,642	2.20	119
Slovenia	2,058,821	0.40	84	Netherlands	16,779,575	3.30	131
Lithuania	2,971,905	0.58	66	Romania	20,057,458	3.95	47
Croatia	4,262,140	0.84	61	Poland	38,533,299	7.59	65
Ireland	4,591,087	0.90	129	Spain	46,704,308	9.21	99
Slovakia	5,410,836	1.06	73	Italy	59,685,227	11.77	100
Finland	5,426,674	1.07	115	United Kingdom	63,730,107	12.56	109
Denmark	5,602,628	1.10	126	France	65,633,194	12.94	109
Bulgaria	7,284,552	1.43	46	Germany	82,020,578	16.17	121
Austria	8,451,860	1.66	129	**EU-28**	**507,069,424**	**100**	**100**
Sweden	9,555,893	1.85	127		-	-	-

Source:www.europa.eu/about_eu/facts-figures/living [10].

*PPP=purchasing power standard=comparison indicator measuring the price of a range of goods and services relative to income, using a common notional currency called the Purchansing Power Standard

The lowest figures concerning population are in Malta, Luxembourg, Cyprus, Estonia, Latvia, Slovenia and Lithuania whose population represent less than 0,5 % of the EU population (Tabel 1).

The EU population has grown by 2 million people in average per year. The forecasts until 2050 project the following trends: (a) a substantial aging determined by two causes: the lower expectations for births and the higher life expectancy, the highest in the world; (b) a deeper decline in the number of working population because of the decreasing number of young people of 15 years old, (c) an increased number of retired people. Therefore, three major aspects are expected to dominate the EU demography in the future: longevity, a positive aspect, a declining number of children, a negative aspect and an increased migration from low developed economies to the highest developed ones [2].

EU-27 population by living area. A number of 206,683 thousand persons were living in the urban area, representing 41.21 % of the EU-27 population in 2011. The most numerous population in the urban areas is in Malta (100%), the Netherlands (71%), United Kingdom(71%), Belgium (68 %), Luxembourg (62%) and Cyprus (62%). In the same year 2011, in the rural areas a number of 117.464 thousand persons were living, representing 23.43 %. The most numerous

population in this area was registered in Ireland (73%), Slovakia(50%), Estonia (48%), Hungary (47%), Romania (45%). In the intermediate area, about 177,293 thousand persons representing 35.37 % of the EU-27 population were living in this environment. The most population living in the intermediate area was concentrated in Sweden (56%), Estonia (52%) and Bulgaria (45%). Therefore, the EU population is strongly urbanized because about 75 % people are living in the ruban area. In the future, the declining trend is expected to continue so that in the year 2020 it is estinated that the share of population in the ruban space will exceed 90 % in 7 EU member states. [8]

In Romania in 2010, rural population accounted 4,427 thousand people, representing 44.42 % of Romania's population. However, compared to the year 2005, when the rural population was 5,361 thousand people representing 54.4 %, the situation is better showing a reduction of population. [4]

Population growth rate in the EU. An important growth was recorded in the urban area +5.2 at 1,000 inhabitants and in the intermediate area +2.2 at 1,000 capita. In the rural area, the trend was a negative one, the population decreasing by -0.8 at 1,000 inhabitants. Therefore, in the rural area, the population will be lower and lower compared to the other areas, especially with the urban one which is more attractive for better paid jobs.

In 2011, the rural population decline was noticed in 18 EU countries, while in other member states it recorded an increase as follows: Ireland +6.1 at 1,000 inhabitants, France +5.1, United Kingdom +2.7, Italy +2, Finland +1.3, Sweden +1.2, Slovakia +0.8, Spain +0.7 and Czech Republic +0.2. [8]

Employed population in agriculture by EU-27 member states. According to the EU statistics, in 2010, the employement accounted for 212.76 million persons, representing 42.43 % of the EU total population.

In agriculture, it was noticed a number of 10.4 million employed people, of which 9,736,100 full time employed (in terms of annual working unit=AWU), representing 92 %. Since the year 2000, agricultural labour in the EU declined by 25 % in terms of AWU.

The share of people employed in agriculture at the EU level is 5 % of its total population.The highest share is registered in Romania (35 %), Poland (14 %), Greece (12 %), Portugal (11%) and Spain (10%). The lowest weight of the population employed in agriculture was recorded in Italy (3.7 %), France (3%), Belgium(1.8%) and United Kingdom (1.4 %).[11]

In Romania, agriculture is characterized by a high number of employed persons, Romania being placed on the top position in the EU-27 from this point of view, followed by Poland, Italy France, Spain and Germany [5].

Table 2. Employed population in agriculture by EU-27 member states in 2010 (thousand persons)

Country	Employed people in agriculture	Country	Employed people in agriculture
Austria	154.00	Lithuania	366.10
Belgium	80.94	Luxembourg	2.64
Bulgaria	754.70	Malta	18.50
Czech Republic	132.75	United Kingdom	0.00*
Cyprus	78.80	Netherlands	213.00
Denmark	78.10	Poland	3,797.30
Estonia	0.00*	Portugal	708.08
Finland	0.00*	Romania	7,159.47
France	1,012.80	Slovakia	0.00*
Germany	763.70	Slovenia	74.71
Greece	706.35	Spain	2,227.02
Ireland	0.00*	Sweden	141.50
Italy	0.00*	Hungary	1,179.47
Latvia	183.20		

Source: European Commission. EU agriculture-Statistical and Economic Information, 2012, Employment in agriculture. Statistical Sources and Applications; *Lack of data. [7].

Structure of occupied population in the rural area by activity sector. In the EU-27,in 2008, about 57.3 % of people were employed in the tertiary sector, 29.1 % in the secondary sector and 13.6 % in the primary oner. In 2008, in Romania about 32.6 % people was employed in the tertiary sector, 38.1 % in the primary sector and 29.3 % in the secondary one. A relatively similar

situation was noticed in Bulgaria, Hungary and Poland [15].

Agricultural population structure in the EU by origin. Most of the working labour, more precisely 75 % is represented by family full time work force, 17 % by nonfamily full-time work force and 8 % by part-time nonfamily work labor. Exception: France where about 44 % is full time employed in family farms, Slovakia with 28 % and Czech Republic with 22 %.

Taking into account the legal status, about 97.1 % persons are owners of agricultural holdings and 2.9 % are juridical persons.

Agricultural population structure in the EU by gender. About 50 % of active age persons are women, but only 44 % are employed. There are differences from a country to another. A reduced percentage of employment, more exactely less than 40 % was registered in Italy and Greece, while a high employment percentage was recorded in Finland, Estonia and Lithuania, in the Nordic countries in general (over 48 %).

At EU level, the share of women is 28 %. But, there are countries where women are highly employed like in Romania (34.5 %) and countries were the percentage is very small like Belgium, Denmark, Malta, Sweden and United Kingdom.

In 2011 compared to 2010, the employement rate for women recorded a reduction of -1.3 % compared to -2.1 % total employment rate for women in the EU-27.

About 60 % women are working in the agriculture of three countries: Romania 34.5 %, Poland 18 % and Italy 9 %.

The major problems women are facing in he EU agriculture are: the equal chance on the labor market for getting a job, equal payment for equal work and equal chance for making decisions [14].

Agricultural population structure in the EU by age. The main feature of rural population is aging in the EU, because the number of young people wishing to work in agriculture declines, mainly in Romania and Bulgaria. But, the highest percentage of young people working in agriculture was noticed in Denmark and the Netherlands, because these two countries are mainly agricultural countries and young people is accustomed to work together with their parents in the farm since their childhood. In Poland and Hungary, agriculture looks to be more attractive than in other countries for young people.

If we compare the situation in Romania and Bulgaria, we can notice that people working in agriculture is very old. In Romania, 66.7 % of working people in agriculure is older than 55 years while in Bulgaria the percentage is higher (70.1 %). Analyzing in more details, one can easily notice that: in Romania, the age structure of the working people in agriculture is the following one: 44.2 % belong to the category over 64 years; 22.5 % belong to the 55-64 years category, 17 % belong to the 45-54 category, 11.9 % belong to the 35-44 years category and 4.4 % belong to the category below 35 years. [15]

Agricultural population structure in the EU by education level. In general, farmers' education level is very low. However, in the EU, about 20 % farmers have a basic or complete agricultural training. But the farmers' training level varies from a country to another between 71 % in the Netherlands and less than 1 % in Malta.

Regarding the education level of the young people belonging to the 30-35 years category, one could say that 25 % have a predominant rural education, 38 % have a predominant urban education and 30 % have an intermediary education.

It is wise as the work force to be better trained in order to enhance its capacity to keep pace with the increased international competition, but the amount of money spent on education varies from a country to another.

Income per annual working unit (AWU) in the EU agriculture. In general, income in agriculture is smaller than in other fields of activity. The EU Commission Report, 2011 showed that 16.9 % of the total EU population is facing the poverty risk. The highest share of the population in poverty risk is in the following countries: Latvia (26%), Romania (22 %), Bulgaria (21%), Lithuania (21 %),

Greece (20 %), Spain (19%) and Italy (17 %).[16].

In agriculture of the EU, the annual income accounted for Euro 18,000 per AWU (annual working unit) in average in the EU-15 in the year 2000. In the year 2007, it accounted for Euro 25,000 per AWU in the EU-15 and Euro 16,000 per AWU in the EU-27. In the year 2008, an AWU received in average Euro 23,000 in the EU-15 and Euro 16,000 in the EU-27. Therefore the states belonging to the EU-15 have a double income per agricultural working unit compared to the EU-27 average, except Greece and Portugal which are below this figure. All the12 countries who joined the EU in 2004 and 2007 registered a lower inocme than the EU-27 average.

According to the Eurostat data in 2007, the highest income per AWU was registered in the following countries: Euro 59,000 in Denmark, Euro 44,000 in the Netherlands and also in Belgium, Euro 43,000 in United Kingdom, Euro 40,000 in Luxembourg, Euro 39,000 in Sweden, Euro 38,000 in Germany and Euro 33,000 in France. The countries where the income per AWU was slightly higher than the EU-27 average were the following one: Euro 28,000 in Finland, Euro 25,000 in Austria, Euro 24,000 in Italy, Euro 21,000 in Spain and Euro 18,000 in Malta. The income achieved below the EU-27 average was recorded in the follwoing countries: Euro 16,000 in Czech Republic, Euro 15,000 in Hungary, Euro 14,000 in Greece, Euro 11,000 in Lithuania, Euro 8,000 in Slovakia, Latvia, Cyprus and Portugal, Euro 7,000 in Poland, Euro 3,000 in Slovenia and Bulgaria, and finally Euro 2,000 in Romania, the last position.

In 2010 compared to the year 2000, income coming from agriculture increased by 12.3 % in the EU-27. Agricultural income increased in 21 countries and decreased in 6 countries. The highest growth was registered in the following countries: Denmark (+54.8%) and Estonia (+48.8 %), followed by Ireland (+39.1 %), the Netherlands (+32 %), France (+31.4 %), Latvia (+25.5%), Belgium (+24.1 %), Bulgaria (+23%) and Germany (+22.8%). The highest decrease was recorded in Romania and United Kingdom (-8.2 %), Greece (-4.3 %) and Italy (-3.3 %).

Taking into account that in 2008 there were 13.7 million farmers in the EU, their structure by income class was the following one: 5 % less than Euro 5,000, 34 % Euro 5,000, 16 % between Euro 5,000 and 10,000, 11 % between Euro 10,000 and 15,000, 7 % between Euro 15,000 and 20,000, 5 % between Euro 20,000 and 25,000, 4 % between 25,000 and 30,000 Euro, 3.5 % over Euro 70,000. Therefore, the higher income, the lower percentage.

Income per AWU by farm size in the EU.

Taking into account farm size, the highest income over Euro 35,000 per AWU is achieved in the largest farms producing over Euro 120,000 gross margin. It is 10 times higher than in the small farms where the average income per AWU is only Euro 3,500. This is caused by the agricultural land a farmer owns. The lager farms with over 168 ha in average, having 20 times more land than the smalest farms, have in general 4 times more employees.

In 2010, income per AWU according to farm size was the following one: 3 % of the number of farms achieved over Euro 70,000/AWU/year; 38 % of farms obtained between Euro zero and 5,000 per AWU/year, 2 % farms registered less than Euro 10,000 per AWU and 7 % farms recorded a negative income, therefore losses and not profit.

The income difference reflects production orientation and performance, diversity of farm structure and applied technologies, natural conditions and input price in the EU member states. In the last decade, the main trends noticed in the field of agricultural labor have been the following ones;gains in productivity due to the reduction of labor force and number of farms and increased farm size[18].

The factors which influenced the income per annual working unit in the EU.

The fact that income per working unit increased by about 1 %, in fact it could be considered that it remained relatively at a constant at the EU level in 2012 compared to 2011, was determined by many factors among

which the main ones are: the economic crisis and the increase of input prices, while agricultural labour input slightly decreased by -0.2 % [1,3].
This situation appeared after an increase by 8,3 % in 2011 and 17.1 % in 2010. Also, agricultural labour input increased by 0.7 % in 2012. Also, taking into account only the countries belonging to the EU-15, agricultural income increased by 3.6 % and decreased by -11.9 % in the member states which joined the EU in 2004 and 2007 (12 states).
The largest increase of income per AWU in 2012 was registered in Belgium (+27.9%), Latvia (+21%), Lithuania (+17.6 %), the Netherlands (+14%) and Germany (+14 %). The deepest decline was noticed in Romania (-27.1 %), Poland (-13.7%) and Slovenia (-12.2 %), Hungary, United Kingdom, Ireland and Austria (-7.5 %).
The EU-15 contributed by 83 % to the total income produced in agriculture and by 50 % to the total agricultural labour input of the EU-27 in the year 2012.

Table 3. Real income change/AWU by EU-27 member states in 2012 compared to 2011

Country	2012/2011 %	Indices in 2012 2005=100	Country	2012/2011 %	Indices in 2012 2005=100
EU-27	+1.0	129.7	Spain	+2.4	100.3
Belgium	+30.0	136.3	Cyprus	+1.7	94.1
The Netherlands	+14.9	114.7	Italy	+0.3	93.9
Lithuania	+13.6	175.4	Poland	-0.3	182.4
Germany	+12.1	140.8	Czech Rep.	-1.4	165.0
Portugal	+9.3	100.9	Greece	_2.0	103.2
Estonia	+9.1	209.8	Slovakia	-5.3	189.4
Latvia	+8.8	136.4	United Kingdom	-6.6	140.8
Bulgaria	+8.7	147.3	Malta	-9.0	74.9
Denmark	+5.2	134.7	Ireland	-10.1	82.7
France	+4.2	134.1	Austria	-10.2	114.4
Luxembourg	+3.7	76.7	Slovenia	-15.1	97.9
Finland	+3.3	126.7	Hungary	-15.7	152.7
Sweden	+3.1	129.3	Romania	-16.4	129.8

(a)The economic crisis diminished the income of agriculurists and led to a reduction of employed labor. In the period 2005-2012, real income/worker increased by 29.7 %, while employed working force declined by 20 %. In 2012, income in agriculture increased in 16 countries and decreased in 11 states of the UE-27, as follows: the highest income increase was registered in: Belgium (+30%), the Netherlands (+14.9 %), Lithuania (+13.6 %) and Germany (+12.1 %); the highest reductions were recorded in Romania (-16.4%), Hungary (-15.7 %) and Slovenia (-15.1 %).

(b)The increased cost of farm input diminished the agriculturists' income.

In fact, in 2012, real income resulted from the increase by 1.8 % of agricultural production value in terms of producer price and farm input price by 1.6 %. ***Agricultural production value*** increased mainly due to price growth by 6.3 % in vegetal production and by 3.9 % in animal production. ***Prices for farm input*** increased by +3,2 % for buildings maintenance, by +3.7 % for foodstuff, by +4.7 % for seeds and seeding material, by +6.3 % for energy and fuels, by +6.6 % for intermediary services and by +6.7 % for fertilizers and land reclamation.
In this context, as long as income growth is not enough high to cover production costs, direct payments should be provided in order to support farmers in order to maintain farm profitability under the condition of economic crisis [17].

CONCLUSIONS

In the EU-27 there large differences regarding the rural and agricultural population.The main trend is the reduction of agricultural

population, but there are countries where it is increasing and states where it is declining.
Other features of the EU population are: population aging, relatively low training level, gender discrepances from a country to another, low income per annual working income mainly in the 12 countries which joined the EU in 2004 and 2007 below the EU average income.
However, agriculturists income has slightly increased despite of the economic crisis and increased input price.
Romania has the highest agricultural population, small sized farms and the lowest income per farmer below Euro 2,000. The gap beween the EU and Romania could be diminished by training, high technologies, implementation of associative forms in agriculture deestined to grow up productivity and competitiveness.

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CONSIDERATIONS ON UTILIZED AGRICULTURAL LAND AND FARM STRUCTURE IN THE EUROPEAN UNION

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Abstract

The paper aimed to analyze the EU-27 agricultural land, farms structure and size based on Eurostat data. In the EU, farm structure shows that farms have a small size accounting for 12 ha in average. The highest farm size is in Czech Republic (152 ha) and the smallest one in Romania and Cyprus (3 ha). The size of farms has slowly increased from a year to another while the number of farms declined. About 80 % farms are situated in Romania, Italy, Poland, Spain, Greece, Hungary and France. Three countries France, Italy and Germany produces 50.51 % gross margin of the EU-27 which accounted for Euro 278.33 Billion in 2010. A number of 199,400 farms achieved 46.6 % of the total gross margin, more exactly Euro 129,810 million. These farms utilized 25 % of the Eu-27 agricultural land. The farms with less than Euro 2,000 gross margin represent 45.44 % of the total number of farms and keep 5 % of the utilized agricultural land and produce 3.39 % of the EU-27 gross margin. The farms with a higher dimension produce the highest gross margin proving that farm size has a direct influence on profitability and economic efficiency.

***Key words*:** *European Union, farm size, farm structure, utilized agricultural land*

INTRODUCTION

The EU agriculture is highly developed but important differences are from a country to another In the EU the development of agriculture is based on small scale farms, the average farm size being about 12 ha, ranging between 152 ha in Czech Republic and 3 ha in Cyprus and Romania [1].

The small farmers play a key role in meeting the future food demand of the population. Their capability to adapt to market needs, to orient their agricultural systems, to operate in an efficient manner could support their business development and help them to move from subzistence to commercial farming [2].

In this context, this paper aimed to present the actual situation of agricultural holdings in the EU-27 in terms of utilized agricultural land, number of farms, farm structure and size.

MATERIALS AND METHODS

The paper is based on the data collected from the EU data base Eurostat. The following aspects have been approached: EU surface and its distribution by member states, agricultural land and its distribution by member states, number of farms by farm class, farm size, income per AWU and farm size class. The main characteristics of this aspect were presented in a critical manner. Also, the situation of farm structure in Romania was presented pointing out its position in the EU.

RESULTS AND DISCUSSIONS

The EU-27 surface area accounts for 4,271.6 thousand of square kilometers. The surface of each member state is given in Table 1. The countries with the largest surface are France, Spain, Sweden, Germany, Poland, Finland, Italy, United Kingdom and Romania. The smallest countries are Malta, Luxembourg and Cyprus.

Utilized agricultural land in the EU-27. In 2010, the EU-27 had 170 million utilized agricultural land representing 40 % of the EU territory. A number of 7 countries utilized 75 % of the agricultural land as follows: France

27.1 million ha (15.9 %), Spain 23.8 million ha (14 %), Germany 16.7 million (9.8%), United Kingdom 15.9 million ha (9.4%), Poland 14.4 million ha (8.5%), Romania 13.3 million ha (7.8%) and Italy 12.9 million ha (7.6%).

Table 1. EU-27 area (‘000 square kilometers)

Country	Surface area (‘000 s.km)	Country	Surface area (‘000 s.km)
Malta (MT)	0.3	Portugal(PT)	91.9
Luxembourg (LU)	2.6	Hungary (HU)	93.0
Cyprus (CY)	9.3	Bulgaria (BG)	111.0
Slovenia (SI)	201.	Greece (EL)	130.7
Belgium (BE)	30.3	Romania (RO)	230.0
Netherlands (NL)	33.8	United Kingdom (UK)	243.8
Denmark (DK)	43.1	Italy (IT)	295.1
Estonia (EE)	43.4	Finland (FI)	304.5
Slovakia (SK)	49.0	Poland (PL)	312.7
Croatia (HR)	56.5	Germany (DE)	357.0
Latvia (LV)	62.3	Sweden (SE)	410.3
Lithuania (LT)	62.7	Spain (ES)	506.0
Ireland (IE)	68.4	France (FR)	544.0
Czech Republic (CZ)	77.3	**Total surface**	**4,271.6**
Austria (AT)	82.5	-	-

Source: Living in the EU, www.europa.eu/about-eu/facts-figues/living [5].

In the period 2003-2010, the utilized agricultural land decreased in 18 member states and increased in 9 countries. The highest reductions were recorded in Cyprus (-24.3%), Slovenia (-9.4%), Austria (-8%) and the highest growth was recorded in Bulgaria (+24.7%), Latvia (+19.9%) and Estonia (+18%).(Table 2).

Number of farms in the EU-27. In the year 2010, the EU had about 12 million farms by 20 % less than in 2003, a positive aspect in close connection with farm size. Therefore, the reduced number of farms means a larger farm size.

In 7 countries there are 80 % of the RU-27 agricultural farms as follows: Romania 3.9 million farms (32 %), Italy million farms (13.5 %), Poland 1.5 million farms (12.5 %), Spain 1 million farms (8.2 %), Greece 0.7 farms (5.9%), Hungary 0.6 million farms (4.8%) and France 0.5 million (4.3%). The remaining countries have smaller shares as follows: Bulgaria 3 %, Portugal 3 %, Germany 2 %, United Kingdom 2 %, Lithuania 2 %.

The number of farms decreased during the period 2003-2010. The most important reductions were noticed in Estonia 46.6 %, Bulgaria 44.2 %, Latvia 34.4 % and Poland 30.7 % [12].

Table 2. Utilized agricultural area (AAA) by EU-27 member states in 2010 (thousand ha)

Country	Utilized agricultural area(thousand ha)	Country	Utilized agricultural area(thousand ha)
Austria	2,878	Lithuania	2,743
Belgium	1,374	Luxembourg	-
Bulgaria	4,476	Malta	11
Czech Republic	3,484	United Kingdom	16,043
Cyprus	118	Netherlands	1,872
Denmark	2,647	Poland	14,447
Estonia	941	Portugal	3,668
Finland	2,291	Romania	13,753
France	27,837	Slovakia	1,896
Germany	16,704	Slovenia	483
Greece	3,302	Spain	23,753
Ireland	4,991	Sweden	3,066
Italy	12,856	Hungary	4,686
Latvia	1,796	**TOTAL EU-27**	**172,398***

Source: Eurostat, Farm structure statistics, http://epp.eurostat.ec.europa.eu/ statistics_explained/ images/ 5/5a/ Agricultural_holdings%2C_2000-2010.png, * Figures include also Norway, Switzerland and Croatia. [4].

Farm distribution by EU utilized agricultural land classification among member states. Taking into consideration, the utilized agricultural land, the distribution of farms in the EU-27 was the following one in the year 2010: farms with over 60 ha in Czech Republic, Denmark, Slovakia and United Kingdom; farms with 30-59 ha in Germany, Estonia, Ireland, France,

Luxembourg, Finland and Sweden; farms with 15-29 ha in Belgium, Spain, Latvia, the Netherlands and Austria; farms with 8-14 ha in Bulgaria, Italy, Lithuania, Hungary, Poland and Portugal, and farms with 0-7 ha in Greece, Cyprus, Malta, Romania and Slovenia [11].

Table 3. Number of agricultural holdings by EU-27 member states in 2010 (thousand)

Country	Number of agricultural holdings (thousand)	Country	Number of agricultural holdings (thousand)
Austria	150.2	Lithuania	199.9
Belgium	48.0	Luxembourg	2.3
Bulgaria	370.5	Malta	12.5
Czech Republic	22.9	United Kingdom	226.7
Cyprus	38.9	Netherlands	72.3
Denmark	42.1	Poland	1,506.6
Estonia	19.6	Portugal	305.3
Finland	63.9	Romania	3,931.4
France	516.1	Slovakia	24.5
Germany	499.1	Slovenia	74.7
Greece	674.9	Spain	989.8
Ireland	139.9	Sweden	71.1
Italy	1,620.9	Hungary	576.8
Latvia	83.4	**TOTAL EU-27**	13,627*

Source: Eurostat, Farm structure statistics, http://epp.eurostat.ec.europa.eu/statistics_explained/images/5/5a/ Agricultural_holdings%2C_2000-2010.png
* Figures include also Norway, Switzerland and Croatia. [4].

Farm structure by agricultural profile. In the EU-27, about 25 % farms are dealing with crop production (cereals, industrial plants and vegetables); 20 % farms are dealing with permanent crops, 15 % farms are dealing with animal husbandry and 40 % are other farms.

Farm size. In general the EU agriculture is characterized by small farms. The average farm size at the EU-27 level was 12.7 ha in 2010.

The largest farms can be seen in Czech Republic (152 ha), United Kingdom (79 ha), Denmark (65 ha), Luxembourg (59 ha), Germany (56 ha) and France (53 ha). The smallest farms are in Malta (1 ha), Cyprus (3 ha), Romania (3 ha), Greece (6 ha) and Slovenia (6 ha).

Regarding the small farms, the largest ones with over 100 ha have a share of 50 % in the utilized agricultural land and 49 % of the smallest farms with less than 2 ha work just 2 % of agricultural land.

In Romania, there are 3,856,000 farms of which: 97.7 % farms have less than 10 ha and cultivate 40 % of the utilized surface, 1.9 % farms have 10-100 ha and cultivate 12 % of the agricultural utilized land and 0.4 % farms are larger than 100 ha and cultivate 48 % of the utilized land. Therefore, Romania is on the top position regarding the number of farms/country and also on the last position concerning farm size [10].

Analyzing in more details, 2,740,000 farms with less than 1 ha, representing 71.1 % of their total number (3,856,00 farms), utilize 5,073,000 ha, representing 34.5 % of the total agricultural land of Romania (14,685,000 ha). The 1,044,000 subsistence and semi-subzistence farms (1-10 ha) account for 27.1 % of the total number of farms and work 3,108,000 ha weighting 21.2 % of the total agricultural land.

Table 4. Romania's farm structure in 2012

Farm type	Farm size (ha)	Number of farms (thousands)	%	Agricultural land (thousand ha)	%
Not financed households	< 1	2,740	71.1	5,073	34.5
Subzistence and semisubzistence farms	1-10	1,044	27.1	3,108	21.2
Commercial farms of which:	10-55,000	72	1.8	6,504	44.3
-family farms	10-50	60	1.5	1,494	10.2
-companies	100-55,000	12	0.3	5,010	34.1
Total	-	3,856	100	14,685	100

Source: Otiman I.P., 2012, Agricultural structure in Romania, Review of Sociology no.5-6/2012, p.339-359; Agricultural Census in Romania, 2011 [3].

In Romania there are only 72 commercial farms, whose size vary from 10 ha to 55,000 ha. They represent 1.8 % of the number of farms in the country, work 6,504,000 ha weighting 44.3 % of the total agricultural land. Of these farms, only 12 companies have between 100 and 55,000 ha, representing 0.3 % of the total number of farms and own 5,010,000 ha weighting for 34.1 % of the total agricultural land. The 60 commercial family farms have 10-50 ha and work 1,494,000 ha. They represent 1.5 % in the number of farms and 10.2 % in the agricultural land (Table 4).

Farm structure by economic size in the EU. The economic size of a farm is measured in ESU whose value is Euro 1,200. The most numeruous farms in the EU have a smaller economic dimension. About 5 5 of the utilized agricultural land belongs to the farms achieving Euro 2,000.

The EU farm classification based on the economic size is the following one: Very small farms (Less than ESU 4), Small farms (ESU 4-8), Inferior Average Fams (ESU 8-16), Superior Average Farms (ESU 16-40), Large farms (ESU 40-100) and Very large farms (Over ESU 100).

Gross Margin created in the EU-27 agriculture. In 2010, the total gross margin created in the EU-27 agriculture accounted for Euro 278,330 million. A number of 3 countries achieved all togethre 50.51 % of this figure as follows: France, the 1st position, Euro 50,733.2 million (18.22 %), Italy , the 2nd position, Euro 48,450.3 million (17,4 %) and Germany, the 3rd position with Euro 41,454.1 milion (14.89 %).

Table 5. Gross output created in the EU-27 by size class in 2010

Size class - Euro	Gross output (Euro million)	%
Over 500,000	85,587.9	30.75
250,000-499,999	44,253.7	15.89
100,000-249,999	58,133.1	20.88
50,000-99,999	30,743.4	11.04
25,000-49,999	20,836.9	7.48
15,000-24,999	10,562.8	3.79
8,000-14,999	10,145.3	3.64
4,000-7,999	8,214.5	2.95
2,000-3,999	5,345.7	1.92
Sub 2,000	4,116.9	1,47

Source: Eurostat Statistics Explained, 2012 [7].

The countries with the highest contribution to the EU-27 gross output, in the decreasing order are: France (18.22 %), Italy (17.40 %), Germany (14.89), Spain (12.20 %), the Nertherlands (6.8%), Romania (Euro 10,420.1 million (3.74 %).

About 30.75 % of total gross output created in agriculture is produced by farms belonging to the category Euro over 500,000. About 15.85 % of gross output is produced by the farms belonging to the category Euro 250,000-499,999 and 20.88 % gross output is obtained by the 100,000-249,999 size class. Therefore, more than 65 % gross output is created by the highest size class (Table 5).

Gross margin over Euro 500,000 is created by 70,200 farms representing 0.59 % of the EU027 farms. In this category, 3 countries keep 50.55 % farms as follows: Germany 13,300 farms (18.94 %, Italy 11,300 farms (16,09 %) and France 10,900 farms (11.52%).

Gross product less Euro 2,000 is created by 5,333,000 farms that is by 45.44 % of the EU-27 total number of farms. A number of 5 countries keep 82.98 % farms as follows: Romania 2,816,300 farms (52.80 %), Poland 485,400 farms (9.10 %), Italy 518,300 farms (9.71%), Hungary 378,600 farms (7.09%) and Spain 228,700 farms (4.28 %) (Table 6).

Table 6. Farm structure in the EU-27 by gross product size class in 2010

Size class - Euro	Number of farms	%
Over 500,000	70,200	10.59
250,000-499,999	129,300	1.10
100,000-249,999	372,700	3.17
50,000-99,999	433,800	3.69
25,000-49,999	588,100	5.01
15,000-24,999	567,300	4.83
8,000-14,999	826,400	7.04
4,000-7,999	1,454,000	12.39
2,000-3,999	1,859,900	15.84
Sub 2,000	5,095,500	43.42
0	238,000	2.02

Source:Eurostat Statistics Explained, 2012[2].

Income/AWU by farm size in the EU-27. Taking into account farm size, the highest income/annual working unit is achieved by the largest farms whose gross margin is Euro over 120,000. It is 10 times higher than the income produced by the small farms

accounting for only Euro 3,500 per AWU. This aspect is explained by agricultural land size. The large farms have over 168 ha in average, therefore a surface 20 times higher than the small farms and also they have 4 times more workers.

Farm structure by income per AWU classes in the EU-27. In 2010, 3 % farms obtained over Euro 70,000 per AWU, 33 % farms achieved between Euro zero and 5,000 per AWU, 1 % farms recorded less than Euro 10,000 per AWU and 7 % farms registered a negative income.

The farm gross margin is deeply determined by natural conditions, farm profile, production diversity, apllied technologies, input price.

CONCLUSIONS

The EU agricultural land is differently distributed among the member states. The farm size is small, in average accounting for about 12 ha, but it varies from a country to another, the highest size being recorded in Czech Republic (152 ha) and the smallest size in Romania and Cyprus (3 ha).

The main trend in the last decade was the decreasing number of farms in the favour of farm size.

However, 80 % farms are situated in 7 countries: Romania, Italy, Poland, Spain, Greece, Hungary and France.

The EU-27 achieved Euro 278.33 Billion gross margin in 2010, of which 50.51 % is obtained in three countries: France, Italy and Germany.

Gross margin of Euro 250,000, totalizing Euro 129,810 million (46.6%) of the total gross margin of the EU-27 is achieved by 199,400 farms, that is 1.7% of their total number and keep 25 % of the utilized agricultural land.

The farms with less than Euro 2,000 gross margin represent 45.44 % of the total number of farms and keep 5 % of the utilized agricultural land and produce 3.39 % of the EU-27 gross margin.

The farms with a higher dimension produce the highest gross margin proving that farm size has a direct influence on profitability and economic efficiency.

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CONSIDERATIONS ON ROMANIA'S VEGETABLE MARKET

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Abstract

The paper aimed to present the situation of Romania's vegetable market in the period 2007-2011 based on the statistical data regarding the main vegetables: tomatoes, onion, garlic, cabbage, green peppers and melons. The vegetable production increased by 33.99 from 3,166.8 tons in 2007 to 4,176.3 tons in 2011.This was due to the yield gain as follows: 58.55 % for melons, 27.62 % for green peppers, 27.05 % for tomatoes, 25.99 % for dry garlic, 24.96 % for dry onion, 12.61 % for white cabbage. In 2011, the contribution of various categories of vegetables to production was: 24.55 % white cabbage, 21.81 % tomatoes, 15.45 % melons, 9.44 % onion, 6.06 % green pepper, 1.59 % garlic and 21.1 % other vegetables. The contribution of the micro regions to vegetable production in 2011 was: 19.46 % South Muntenia, 18.95 % South East Romania, 17.30 % South West Oltenia, 15.92 % North East Romania, 10.43 % West Romania, 8.47 % North West Romania, 6.54 % Central Romania, 2.93 % Bucharest Ilfov. Vegetable production per inhabitant is higher in Romania compared to the average production per capita in the EU. The average consumption increased as a postive aspect reflecting the obtained production and import. Vegetable production should increase in order to cover much better the doestic market needs and support export to the EU market.

Key words**:** *cultivated area, market, production, Romania, vegetables*

INTRODUCTION

Vegetables are rich in a large variety of nutrients important for human diet: fibers, vitamins (A,C K, etc), minerals (K, Ca, Mg, Fe, Zn etc), and also proteins and fats in small amounts. Due to their chemical composition, vegetables are recommended to be consumed in the daily diet in 3-5 portions mainly as fresh, chopped, boiled vegetable and also as vegetable juice [1, 2].

Due to the intensive campaign on vegetable importance in the human diet for a healthy life, vegetable consumption has continuously increased. From this point of view, Romania comes on the 6th position in the EU, after Italy, Germany, Spain, France and Poland [5].

Romania has a high production potential being able to carry out a large variety of vegetable along the year due to its climate and soil conditions which offer them a special taste. Vegetable production has a seasonal character which means that is not able to cover market needs in all the seasons. Also, another feature is the fact that vegetables have to be consumed immediately after harvesting, in general as fresh vegetables in order to preserve their content in vitamins.

In this context, this paper aimed to present the actual situation in Romania regarding cultivated area, yield and production, their distribution in the territory, consumption and trade in order to identify the main trends in the vegetable market.

MATERIALS AND METHODS

The paper is based on the data collected from Romania's Statistical Yearbook, 2012 and regards the period 2007-2011. Also, some data were collected from FAOStat, 2012 and EuroStat, 2012. The following aspects have been approached: vegetable cultivated area, its structure by vegetable category and by macro and micro regions in the territory, vegetable yield, vegetable production, its structure by vegetable category and its distribution in the territory, vegetable production per inhabitant, consumption and average annual consumption per inhabitant,

vegetable trade balance. They were processed using the well known index, share and comparison methods.

RESULTS AND DISCUSSIONS

Surface cultivated with vegetables increased by 3.94 % from 253.4 thousand ha in 2007 to 8,081.6 thousand ha in 2011. The share of cultivated area with vegetables in the total cultivated land registered a slight increase from 3.25 % in 2007 to 3.27 % in 2011(Table 1).

Table 1. Evolution of cultivated area with vegetables and its share in the total cultivated land, 2007-2011

	MU	2007	2008	2009	2010	2011	2011/2007 %
Romania's cultivated area	Thousand ha	7,777.1	7,798.1	7,884.1	7,807.4	8,081.6	103.91
Cultivated area with vegetables	Thousand ha	253.4	268.6	267.1	262.7	263.4	103.94
Share of vegetables	%	3.25	3.44	3.38	3.36	3.27	-

Source: Romania's Statistical Yearbook, 2012.Own calculation. [3]

Cultivated surface by vegetable category. The cultivated surface increased in general for all the categories of vegetables except dry onion and melons. The highest growth was registered by tomatoes in the period 2007-2011, accounting for 12.60 %. In 2011, the cultivated land with tomatoes was 51.8 thousand ha compared to 46 thousand ha in 2007. On the 2nd position, it is situated green pepper whose cultivated area increased by 7.52 % from 18.6 thousand ha in 2007 to 47 thousand ha in 2011.

Table 2. Evolution of cultivated area by vegetable category, 2007-2011 (thousand ha)

	2007	2008	2009	2010	2011	2011/2007 %
Cultivated land with vegetables	2534	268.6	267.1	262.7	263.4	103.94
Tomatoes	46.0	51.5	49.1	49.8	51.8	112.60
Dry onion	34.1	35.0	35.2	33.8	33.1	97.06
Dry garlic	11.5	13.8	13.1	12.8	12.1	105.21
White cabbage	46.1	49.0	48.3	47.0	47.0	101.95
Green peppers	18.6	20.2	20.0	21.0	20.0	107.52
Melons	31.0	29.7	33.5	31.5	30.9	99.67
Subtotal	187.3	199.2	199.2	195.9	194.9	104.05
Other vegetables	66.1	69.4	67.9	66.8	68.5	103.63

Source: Romania's Statistical Yearbook, 2012.Own calculation. [3]

The dry garlic comes on the 3rd position because its cultivated area increased by 5.21 % from 11.5 thousand ha in 2007 to 12.1 thousand ha in 2011. The surface cultivated with white cabbage increased by 1.95 % from 46.1 thousand ha in 2007 to 47 thousand ha in 2011.The cultivated land with melons decreased by 0.33 % from 31 thousand ha in 2007 to 30.9 thousand ha in 2011. The cultivated area with dry onion declined by 2.94 % from 34.1 thousand ha in 2007 to 33.1 thousand ha in 2011 (Table 2).

Structure of cultivated area with vegetables by vegetable category. In 2007, the cultivated land with vegetables had the following structure: 18.19 % white cabbagge, 18.15 % tomatoes, 13.45 % dry onion, 12.23 % melons, 7.34 % green peppers, 4.53 % dry garlic and 26.11 % other vegetables.

In 2011, it was recorded the following structure of the cultivated land with vegetables: 19.66 % tomatoes, 17.84 % white cabbage, 12.56 % dry onion, 11.73 % melons, 7.59 % green peppers, 4.59 % dry garlic and 26.03 % other vegetables.

Therefore, a slight increase of the share of the cultivated area was registered in case of tomatoes, garlic, green peppers, while a slight decline was recorded in case of dry onion and white cabbage.

Distribution of cultivated land with vegetables by macro and micro regions was the following one in 2011: 34.19 % macro region M2, 28.90 %, macro region M4, 21.50 % macro region M3 and 15.41 % macro region M1. By micro region, the order of importance regarding the cultivated land with vegetables was the following one: 19.25 % South Muntenia, 17.69 % North East Romania, 17.25 % South Oltenia, 16.50 % South East Romania, 11.65 % West Romania, 8.67 % North West Romania, 6.74 % Central Romania, 2.25 % Bucharest-Ilfov (Table 3).

Table 3. Land cultivated with vegetables by macro and micro region in 2011

Macro/Micro Region	Cultivated land (ha)	%
Total	263,359	100.00
M1 Macro region	40,605	15.41
-North West	22.840	867
-Center	17,765	6.74
M2 Macro region	90,067	34.19
-North East	46,605	17.69
-South East	43,462	16.50
M3 Macro region	56,626	21.50
-South Muntenia	50,710	19.25
-Bucharest Ilfov	5,916	2.25
M4 Macro region	76,061	28.90
-South West Oltenia	45,439	17.25
-West	30,622	11.65

Source: Romania's Statistical Yearbook, 2012.Own calculation. [3]

Structure of cultivated land with vegetabes in the territory by vegetable category in 2011.

-***Tomatoes*** were cultivated in macroregions as follows: 39.18 % in M4, 34.68 % in M2, 24.79 % in M3 and 11.35 % in M1. By micro region, the share of cultivated land with tomatoes, in the decreasing order was the following one: 21.21 % South Muntenia, 19.84 % West Romania, 19.34 % South West Oltenia, 19.15 % South East Romania, 15.53 % North East Romania, 6.36 % Nort West Romania, 4.99 % Central Romania, 3.58 % Bucharest Ilfov.

-***Onion*** was cultivated as follows: 37.05 % M2, 25.95 % M4, 19.40 % M3 amd 17.58 % M1. By micro region, the situation was the following one: 21.33 % North Eastern Romania, 17.77 % South Muntenia, 15.72 % South Eastern Romania, 14.65 % South West Oltenia, 11.30 % West Romania, 9.09 % Central Romania, 8.49 % North Western Romania, 1.63 % Bucharest Ilfov.

-***White cabbage*** was cultivated by macro region as follows: 29.35 % M4, 27.16 % M2, 24.40 M3 and 19.99 % M1. By micro region, in the decreasing order of the share of the cultivated surface, the situation was the following one: 22.16 % South Muntenia, 18.74 % North East Romania, 16.09 % South West Oltenia, 13.26 % West Romania, 10.10 % North West Romania, 8.99 % Central Romania, 8.42 % South East Romania, 2.24 % Bucharest Ilfov.

-***Green peppers*** weight in tha cultivated area with vegetables by macro region was : 43.39 % M2, 34.90 % M4, 18.50 % M3 and 3.21 % M1. By micro region, the situation was the following one:33.91 % South East Romania, 28.42 % South West Oltenia, 18.07 % South Muntenia, 9.48 % North East Romania, 6.48 % West Romania, 2.67 % North West Romania, 0.54 % Central Romania, 0.43 % Bucharest Ilfov.

Vegetable Yield increased in case of the vegetable categories taken into consideraion in this study, reflecting a better use of varieties and applied technologies. Tomato yield increased by 27.05 % from 13,916 kg/ha in 2007 to 17,602 kg/ha in 2011. Dry onion yield increased by 24.96 % from 9,526 kg/ha in 2007 to 11,904 kg/ha in 2011. Dry garlic yield increased by 25.99 % from 4,359 kg/ha in 2007 to 5,492 kg/ha in 2011. White cabbage average production increased by 12.61 % from 19,364 kg/ha in 2007 to 21,807

kg/ha in 2011. Melon average production grew by 58.55 % from 13,161 kg/ha in 2007 to 20,868 kg/ha in 2011 (Table 4).

Table 4. Vegetable Yield, 2007-2011 (kg/ha)

	2007	2008	2009	2010	2011	2011/2007 %
Tomatoes	13,916	15,814	15,395	15,443	17,602	127.05
Dry onion	9,526	11,294	10,748	10,908	11,904	124.96
Dry garlic	4,359	5,244	4,812	5,250	5,492	125.99
White cabbage	19,364	19,680	20,724	20,858	21,807	112.61
Green peppers	9,931	11,824	12,295	11,592	12,674	127.62
Melons	13,161	18,942	19,490	21,055	20,868	158.55

Source: Romania's Statistical Yearbook, 2012.Own calculations. [3]

Vegetable production increased by 33.99 % from 3,116.8 tons in 2007 to 4,176.3 tons in 2011. This was due to the increase of cultivated surface and mainly due to the yield gain.Tomatoes production increased by 42.17 % from 640.8 tons in 2007 to 911 tons in 2011. Dry onion production increased by 21.32 % from 325 tons in 2007 to 394.3 tons in 2011. Dry garlic production increased by 33.46 5 from 49.9 tons in 2007 to 66.6 tons in 2011. White cabbage production increased by 14.78 % from 893.2 tons in 2007 to 1,025.3 tons in 2011. Green peppers production grew by 37.10 % from 184.9 tons in 2007 to 253.5 tons in 2011. Melon production increased by 58.21 % fom 408 tons in 2007 to 645.5 tons in 2011 (Table 5).

Table 5. Evolution of vegetable production, 2007-2011 (tons)

	2007	2008	2009	2010	2011	2011/2007 %
Vegetable production:	3,166.8	3,819.9	3,901.9	3,863.6	4,176.3	133.99
Tomatoes	640.8	814.4	755.6	768.5	911.0	142.17
Dry onion	325.0	395.6	378.1	369.1	394.3	121.32
Dry garlic	49.9	72.3	63.2	67.2	66.6	133.46
White cabbage	893.2	964.6	1,001.9	981.2	1,025.3	114.78
Green peppers	184.9	238.7	245.7	243.5	253.5	137.10
Melons	408	562.3	652.8	662.9	645.5	158.21
Subtotal	2,501.8	3,047.9	3,097.3	3,092.4	3,296.2	131.75
Other vegetables	615	771	804.6	771.2	880.1	143.10

Source: Romania's Statistical Yearbook, 2012.Own calculations [3]

Contribution of various vegetables to production. In 2007, the situation was the following one: 28.65 % white cabbage, 20.55 % tomates, 13.09 % melons, 10.42 % dry onion, 5.93 % green peppers, 1.60 % dry garlic, 19.76 % other vegetables. In 2011, the decreasing order of the contribution of vegetables to production was: 24.55 % white cabbage, 21.81 % tomatoes, 15.45 % melons, 9.44 % onion, 6.06 % green pepper, 1.59 % garlic and 21.1 % other vegetables.

Distribution of vegetable production in the territory by macro region was the following one in 2011: 34.87 % M2, 27.73 % M4, 22.39 % M3 and 15.01 % M1. In the decreasing order, the contribution of the micro regions to vegetable production was the following one in 2011: 19.46 % South Muntenia, 18.95 % South East Romania, 17.30 % South West Oltenia, 15.92 % North East Romania, 10.43 % West Romania, 8.47 % North West Romania, 6.54 % Central Romania, 2.93 % Bucharest Ilfov**.**

-Tomato production was achieved by macro region as follows: 36.64 % M2, 26.57 % M4, 25.05 % M3 and 11.74 % M1. By micro region, tomato production was carried as follows: 23.04 % South East Romania, 19.01 % South Muntenia, 18.18 % South West

Oltenia, 13.60 % North East Romania, 8.39 % West Romania, 7 % North West Romania, 6.04 % Bucharest Ilfov, 4.734 % Central Romania.

-***Onion*** was achieved as follows: 24.10 % M4, 38.45 % M2, 19.24 % M3, 18.21 % M1. By micro reion, the situation was the following one: 20.99 % North East Romania, 18.04 % South Muntenia, 17.46 % South East Romania, 13.09 % South West Oltenia, 10.10 % Central Romania, 9.01 % West Romania, 8.82 % North West Romania, 1.20 % Bucharest Ilfov.

-***Cabagge*** was produced as follows: 27.24 % in M3, 27.24 % in M2, 26.50 % in M4 and 19.02 % in M1. The production achieved by macro region was presented as follows: 24.42 % South Muntenia, 18.94 % North East Romania, 14.87 % South West Oltenia, 11.63 % West Romania, 9.81 % North West, 9.21 % Central Romania, 8.30 % South East Romania, 2.82 % Bucharest Ilfov.

-***Melon production*** was carried out by the following contribution of macro regions: 44.63 % M2, 35.71 % M4, 16.25 % M3 and 3.41 % M1. The contribution by micro region was: 36.10 % South East Romania, 29.11 % South West Oltenia, 15.86 % South Muntenia, 8.03 % North East Romania, 6.60 % West Romania, 3.02 % North West Romania, 0.39 % Central Romania and 0.39 % Bucharest Ilfov (Table 6).

Table 6. Vegetable production by macro and micro region, 2011 (kg)

Region	Vegetable production	Tomato	Onion	Cabbage	Melons
Production:	4,176,298	910,978	394,305	1,025,293	645,486
M1	627,034	106,949	71,814	195,022	22,016
North West	353,968	63,847	34,795	100,587	19,558
Center	273,066	43,102	37,019	94,435	2,458
M2	1,456,416	333,839	151,648	279,369	288,121
North East	665,168	123,929	82,766	194,282	51,835
South East	791,248	209,910	68,882	85,085	236,286
M3	935,294	228,284	75,883	279,373	104,944
South Muntenia	813,045	173,177	71,170	250,423	102,418
Bucharest Ilfov	122,249	55,107	4,713	28,950	2,526
M4	1,157,554	241,906	94.960	271,529	230,405
South West Oltenia	722,782	165,626	51,165	152,548	187,964
West	434,772	76,280	43,345	118,981	42,441

Source: Romania's Statistical Yearbook, 2012.Own calculations. [3]

Vegetable production per inhabitant increased by 34.76 % from 144.7 kg in 2007 to 195 kg in 2011 as a consequence of the increased production (Table 7).

This is a pozitive aspect for Romania taking into account as the average production per inhabitant in the EU is smaller: 127 kg (2007), 125 kg (2008) and 131 kg (2009). This reflect Romania's high production potential [5].

Table 7. Production per inhabitant (kg/capita)

	2007	2008	2009	2010	2011	2011/2007 %
Production per capita	144.7	177.6	181.7	180.3	195	34.76

Table 8. Vegetable Consumption, 2007-2009

	MU	2007	2008	2009	2009/2007 %
Vegetable consumption	Thousand tons	3,245	3,738	3,643	112.26
Average annual consumption per inhabitant	Kg/capita	149	173	169	113.42

Source: FAOStat, 2012[4]

Vegetable consumption Romania comes on the 6th position in the EU based on vegetable consumption after Italy, Germany, Spain, France and Poland.
This happens while in other EU countries like Luxembourg, Malta, Latvia, Slovenia and Denmark vegetable consumption is low due to the climate conditions unfavorable to produce vegetables and the high import price.
Average purchase price increased in general in case of all vegetables. For example, in case of tomatoes, it increased by 15.57 % from Lei 1.22/kg in 2007 to Lei 1.41/kg in 2011 (Table 9).

Table 9.Vegetable average purchase price, 2007-2011 (Lei/kg)

	2007	2008	2009	2010	2011	2011/2007 %
Vegetable average purchase price	1.22	0.82	1.06	1.07	1.41	15.57

Source: Romania's Statistical Yearbook, 2012.Own calculations. [3]

The price indices for cabbage and onion are presented in Table 10. The highest increase compared to 2005 level was registered in 2010 (+29.8 %) for cabbage and in 2011 (+101.3 %) for onion.

Table 10. Vegetable price indices (%)(2005=100)

	2007	2008	2009	2010	2011
Cabbage	108.3	103.3	103.3	129.8	92.5
Onion	169.4	164.4	160.4	190.4	201.3

Source: Romania's Statistical Yearbook, 2012.Own calculations. [3]

Average prices for the main vegetables sold in the agro-food markets in 2011 varied from a market to another depending on offer/demand ratio. The average price was Lei 2.19 per kg for onion, Lei 2.16 per kg for tomatoes and Lei 1.01 per kg for cabbage.
-***Tomato price*** varied between the highest levle registered as follows: Lei 4 per kg at Sf.Gheorghe, Lei 3.99 in Arad, Lei 3.65 in Miercurea Ciuc, Lei 3.61 in Brasov and Lei 3.59 in Sibiu and the lowest levels: Lei 1.62 in Slatina, Lei 2.01 in Tg. Jiu, Lei 2.02 in Galati, Lei 2.15 in Focsani and Lei 2.19 in Vaslui.
-***Onion price*** varied between the highest level: Lei 3.21 in Miercurea Ciuc, Lei 3.20 in Zalau, Lei 3.12 in Sibiu, Lei 3.06 in Brasov and the lowest levels: Lei 1.75 in Braila, Lei 1.84 in Craiova and Lei 1.99 in Bacau.
-***Cabbage price*** varied between the highest levels: Lei 2.42 in Brasov, Lei 2.34 in Vaslui, Lei 2.29 in Piatra Neamt and the lowest levels: Lei 1.04 in Alexandria and Giurgiu, Lei 1.10 in Drobeta-Turnu Severin, Lei 1.12 in Craiova.
Romania's trade with vegetables. Romania's vegetable trade balance was characterized in the period 2000-2009 by the following figures: exported vegetable 256 thousand tons, imported vegetables 448 thousand tons, reflecting that Romania is a net importing country as import exceeds export. A part of fresh vegetables are needed to be imported in order to cover internal market needs in the extraseason, which is an incentive to increase consumption and assure a healthy food for population. Vegetables are imported mainly as fresh products and also as frozen products. Market demand is in general relatively constant along the year, except some celebration moments when comsumption increases.

CONCLUSIONS

The most adequate areas for cultivating vegetables are, in the decreasing order: for tomatoes: South Muntenia, West Romania, South West Oltenia and South East Romania; for onion: North East Romania, South Muntenia, North East Romania, South West Oltenia and West Romania; for white cabbage: South Muntenia, North East Romania, South West Oltenia, West Romania; for green peppers: South Eastern Romnaia, South West Oltenia, South Muntenia, North East Romania.
Average vegetable production increased in case of all categories. In the decreasing order, the production gain in the period 2007-2011 was the following one: 58.55 % for melons, 27.62 % for green peppers, 27.05 % for tomatoes, 25.99 % for dry garlic, 24.96 % for dry onion, 12.61 % for white cabbage.

The production gain by vegetable category registered in the period 2007-2011 was the following one: 58.21 % for melons, 42.17 % for tomatoes, 37.10 % for green peppers, 33.46 % for dry garlic, 21.32 % for dry onion, 14.78 % for white cabbage.

In 2011, the contribution of various categories of vegetables to production was: 24.55 % white cabbage, 21.81 % tomatoes, 15.45 % melons, 9.44 % onion, 6.06 % green pepper, 1.59 % garlic and 21.1 % other vegetables.

The contribution of the micro regions to vegetable production in 2011 was: 19.46 % South Muntenia, 18.95 % South East Romania, 17.30 % South West Oltenia, 15.92 % North East Romania, 10.43 % West Romania, 8.47 % North West Romania, 6.54 % Central Romania, 2.93 % Bucharest Ilfov.

Vegetable production per inhabitant is higher in Romania compared to the average production per capita in the EU. The average consumption increased as a postive aspect reflecting the obtained production and import.

Vegetable production should increase in Romania in order to cover much better the domestic market needs and support export to the EU market.

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EVOLUTIONARY ASPECTS OF THE WELFARE OF THE RURAL POPULATION IN THE REPUBLIC OF MOLDOVA AND THEIR MOTIVATIONAL IMPLICATIONS

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Abstract

The paper is focused on the issue of rural population incomes, their evolution, and changes in their structure that occurred in the period 2006-2012. It was performed a comparative analysis of the ratio between the available income per capita and subsistence minimum in rural and urban areas, and based on this, it was highlighted the gap between the welfare of urban and rural population. The result of the study proved that despite positive tendencies in reducing rural poverty, rural population income is still very low, without reaching the subsistence minimum. This fact, along with other negative aspects (reduced share of income from employment, increased share of social allowances and remittances) leads to the decrease of the motivational effects of work payment and income from agricultural activity. Thus, it is obvious, that along with government social programs, to have more effective state actions targeted to business development in rural areas and hence creating new workplaces.

Key words**:** *income, labour market, motivational implications,, poverty, rural areas*

INTRODUCTION

Labour market in the rural areas of the Republic of Moldova is facing a number of significant problems, among which we could mention: reduced number of the employed population, decreasing share of employees with secondary and higher education, population ageing etc. [3,4]. It is because of major negative of demographic phenomena, such as population reduction and rural population ageing because of reduced birth rates and increased mortality rates, as well as the massive exodus of the working age population to work abroad illegally [1,2]. Simultaneously, it should be however noted, another disturbing factor of the labour market in rural areas - the extremely low income of rural population, which causes a high rate of poverty.

The phenomenon of population poverty in the Republic of Moldova and implicitly the poverty in rural areas is a priority concern of the country's government. As an argument we can cite the National Development Strategy "Moldova 2020" which states that the major objective is poverty removal of 149,000 people by 2020. Also it should be noted that after three years of absolute poverty rate growth in rural areas, since 2009, there is a continuous reduction of it. As a result, in 2011 the absolute poverty rate was 17.5%, declining by 8.8 percentage points compared to 2009 [5]. However, this phenomenon persists, being more pronounced in the rural areas.

MATERIALS AND METHODS

Some generalizations, presented in the report on poverty in the Republic of Moldova, 2010-2011, issued by the Ministry of Economy of the Republic of Moldova, as well as a range of research materials on the labour market and rural population served as benchmarks for the study [1,2,3,4]. Also, based on data from the Statistical Yearbook of the Republic of Moldova [6], it was determined the ratio between the available income per capita and subsistence minimum in rural and urban areas, monthly income structure of Moldova's population by areas in the period 2006-2012 and, there were revealed the evolutionary aspects concerning the share of different types

of income in the average monthly sum of the rural population income. Based on the accomplished studies there were identified certain issues related to work motivation in rural areas.

RESULTS AND DISCUSSIONS

The negative impact of rural poverty has serious motivational implications for working and living in these areas. Thus, besides the fact that current income of the rural population is very low, there is also a substantial gap between urban and rural population income. As a result, in 2012, the available income per capita in urban areas exceeded the subsistence minimum by 14.76% (Table 1), while the same ratio in the rural areas was only 87.47% (Table 2), which means a lower income level than the subsistence minimum.

Table 1. Comparative assessment of the subsistence minimum evolution and available monthly income per capita in urban areas

	2006	2007	2008	2009	2010	2011	2012
Subsistence minimum, lei	1, 034.0	1,189.2	1,482.8	1,295.3	1,498.1	1,649.9	1,628.5
Available average monthly income per capita, lei	994.25	1,209.82	1,463.02	1,475.6	1,574.62	1,792.6	1,868.92
Ratio between available income per capita and subsistence minimum, %	96.16	101.73	98.67	113.92	105.11	108.65	114.76

Table 2. Comparative assessment of the subsistence minimum evolution and available monthly income per capita in rural areas

	2006	2007	2008	2009	2010	2011	2012
Subsistence minimum, lei	865.6	1,036.3	1,287.6	1,112.4	1,285.2	1,398.3	1,420.8
Available average monthly income per capita, lei	724.92	879.05	987.47	939.25	1,055.15	1,186.55	1,242.77
Ratio between available income per capita and subsistence minimum, %	83.75	84.83	76.69	84.43	82.10	84.86	87.47

We should also remark an increased pace of growth of the ratio mentioned above in the urban areas compared to rural areas (figure 1).

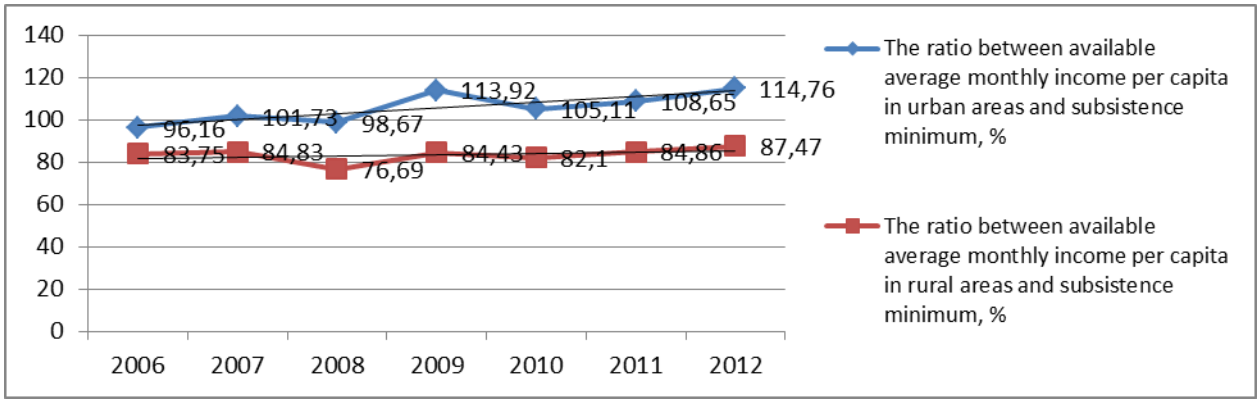

Fig. 1. Comparative evolution of the ratio between available average monthly income per capita in urban and rural areas and subsistence minimum

Another problem of the rural population incomes lies in their structure. According to data presented in Table 3, we can state that the income from employment of the urban population in 2006-2012 ranged between 55 and 57 %, while in the rural areas, since 2007, the cumulative incomes from employment and individual activities in agriculture are lower. Thus, in 2007, the income from employment of the urban population constituted 56.1% of total income, while the income from

employment and agricultural activity of the rural population had only 54.9% of total income. In the next period the gap grows even more. Consequently, in 2012, the employment income of an inhabitant of urban areas constituted about 55.4% of the average monthly earnings, while an inhabitant of the rural areas could reach only 47,45% of the average monthly earnings due to the cumulated income from employment and agricultural activity. Therefore, the income from employment of the rural population represents less than half of the total monthly activities.

Table 3. Structure of monthly income of Moldova's population by areas in the period 2006-2012

Year/ area	The share of incomes based on different sources, %					
	Salary	Individual agricultural activity	Individual non-agricultural activity	Income from properties	Social allowances	Other incomes
2006:						
urban	56,3	2,7	10,4	0,3	11,9	18,3
rural	25,9	34,5	5,2	0	14,7	19,6
2007:						
urban	56,1	2	8,4	0,5	11,9	21,2
rural	26,5	28,4	4,4	0,1	15,2	25,3
2008:						
urban	56,5	1,2	8,8	0,4	13,6	19,5
rural	28	20,7	6,1	0,1	16,3	28,7
2009:						
urban	58	0,9	7,3	0,3	14,9	18,7
rural	30,6	18	5,7	0	20,6	25,1
2010:						
urban	55,2	1,3	8,4	0,2	16,4	18,6
rural	28,9	19,1	5	0,1	21,2	25,7
2011:						
urban	57,2	1,4	7,8	0,7	15,2	17,7
rural	30,6	19,6	5,6	0,1	21,3	22,8
2012:						
urban	55,4	1,3	8,4	0,3	16,2	18,4
rural	28,6	18,8	5,8	0,1	22,5	24,2

Reduced share of income from employment of the rural population represents a problem having the following aspects:

1. People are increasingly aware that their work activity income doesn't ensure their subsistence, thus minimizing the motivational effects of labour remuneration and income from agricultural activity;
2. They begin to rely more and more on such income sources as social allowances and remittances from abroad.

Increased social allowances in the rural areas can be seen as positive in terms of Government concern for socially disadvantaged groups. Thus, in 2006, the rural social allowances were about 106.93 lei monthly per capita, while in 2012, their average monthly amount was of 279.68 lei (Figures 2 and 3). However, their increased share in the average income represents a major problem. Thus, if in 2006 the share of social allowances in the total monthly income was 14.7%, then, in 2012, this indicator increased up to 22.5%.

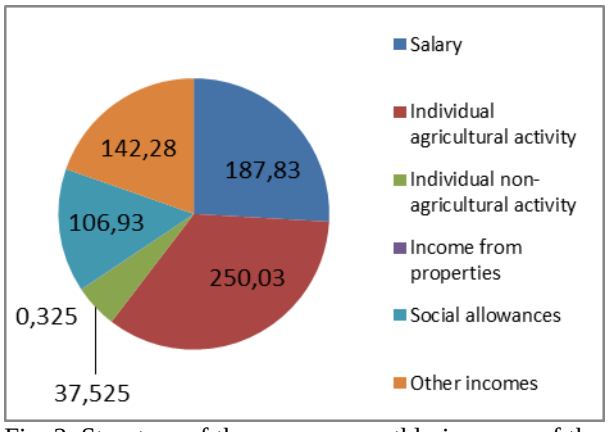

Fig. 2. Structure of the average monthly incomes of the rural population in the Republic of Moldova in 2006

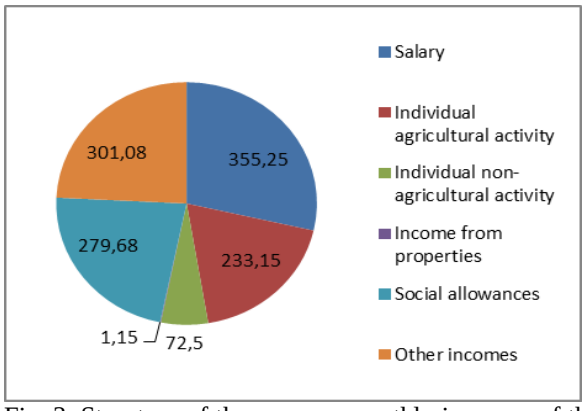

Fig. 3. Structure of the average monthly incomes of the rural population in the Republic of Moldova in 2012

Analyzing the structure of social allowances during the investigated period (2006-2012), we found out that the priority share is held by pensions. Thus, in 2006, the share of pensions in the average monthly amount of social allowances was 85.9%, while in 2012 it was 80.89%, maintaining an enough high level. Also, we can't ignore the concomitant increase of the share of other types of social allowances: child benefits, compensations and social help. However, the largest share of pensions in the total monthly amount of allowances is another indicator of unfavorable labour market in rural areas, characterized by the ageing of total population, and hence, of the working age population.

A special attention should be paid to the remittances from abroad. Thus, while in 2006 they accounted for 116.65 lei monthly per capita in the rural areas (or 16.1% of the average income), then in 2012 the average monthly remittance was 258.25 lei (20.8 % of the average income). This increase in remittance rate would not be a problem if it did not increase their share in the monthly amount of income. The latest trend confirms, however, the existence of several serious problems in the evolution of labour market in the rural areas of the Republic of Moldova:

-Massive exodus of the working age population abroad accompanied by a reduced number of employed population;

-Emerging deficiency in the workforce reproduction process as a result of more intense emigration of young people and their children.

Along with the above mentioned facts, the increasing share of remittances in the average monthly income of the rural population is another factor that reduces the motivational effects of income from employment.

CONCLUSIONS

1. Despite the positive trends, observed in the process of poverty control in the Republic of Moldova in the period 2009-2012, the income of the rural population is still very low, without reaching the subsistence minimum.
2. There is a steady maintenance of the gap between the average monthly incomes of the urban and rural population, to the latter's detriment.
3. The structure of rural population income records a reduced share of income from employment and agricultural activity and an increased share of social allowances and remittances from abroad.
4. Reduced share of income from employment of the rural population generates a reduction of the motivational effects of work payment and income from agricultural activity.
5. Along with governmental social programs it is necessary to develop more efficient state actions oriented to business development in rural areas and hence to the creation of new workplaces.

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ESTIMATION OF EFFICIENCY OF SOIL-PROTECTIVE SYSTEM WITH USE OF BIORESOURCES OF AGRICULTURE ON THE BASIS OF USE OF AGROCENOSIS ON THE GREY FOREST SOILS

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Abstract

The experimental data of long-term researches establishing high efficiency of soil-protective system of agriculture with use of bioresources on biological and humus in condition of arable grey forest soil has been presented.

Key words: *agrocenosis, farming system, grey forest soil, use of bioresources*

INTRODUCTION

In modern agriculture in the conditions of the deficiency of organic and mineral fertilizers proceeding falling of fertility of arable soils the problem of an intensification of use of the biological factors, which role in reproduction of soil fertility is especially actual, preservation of stability and efficiency increase of agro-ecosystems is often underestimated. In the advanced economy of the Vladimir area in last time the ways and methods of agriculture proving viability and efficiency successfully take root in practice [1].

Within 20 years on grey wood soils in Yuryev-Polish State Experimental Station for testing varieties (SESTV) the agriculture system is applied soil-protective, allowing receiving stably high grain yields of cultures at the expanded reproduction of soil fertility:

- the agriculture system provides a heavy use of the biological factor in reproduction of fertility of soil and optimization of a food of plants and includes a complex of the agro - receptions as much as possible adapted for a natural course soil formation processes and functioning of ecosystems;
- optimum combination and alternation of grain and forage cultures in crop rotation structure: steam pure - winter cereals on grain - summer cereals on grain - annual grasses (cereal-legume mixtures) with over seeding a clover on green manure - a clover of 1 of the item - a clover of 2 of the item - winter cereals on grain;
- decrease in volumes of application of mineral fertilizers with use organic (50-100 t/hectares of covering manure) and bioresources (straw of all grain crops of a crop rotation, on the average 20 t/hectares for rotation);
- energy-saving processing of soil with loosening chisel plow to depth 30-40 sm.

The role and value of crop rotation increases in modern conditions with rational alternation of cultures, as leading link of system of agriculture, the major factor of management of material-energy flows and regulations of level of productivity in agro-ecosystem.

MATERIALS AND METHODS

Grain-grass rotation from 25 % of long-term bean grasses, 12.5 % of an annual cereal-legume mixtures, 50 % of winter and summer grain crops on Yuryev-Polish SESTV creation by the predecessor of optimum conditions for the subsequent culture provides, performance soil-protective functions, increase in a share of biological nitrogen, in a food of plants and soil stocks.

RESULTS AND DISCUSSIONS

For rotation 8-full a crop rotation with root and stubble the rests grain and forage crops in

soil (on 1 hectares) comes back nearby 48 т a solid, 667 kg of the nitrogen, almost which half are biologically fixed, 196 kg of phosphorus, 410 kg of potassium, that almost in 2 times exceeds quantity of elements of the food brought with mineral fertilizers (Fig. 1).

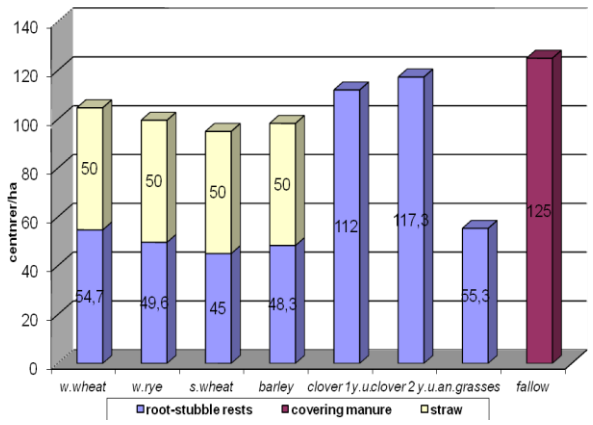

Fig. 1. Receipt a root-stubble of the rests, covering manure (solid), straw in grain-grass a crop rotation on Yuryev-Polish SESTV

In 1970-1985 from 320 kg/hectares NPK brought in fields Yuryev-Polish SESTV to 202 kg or 63% it was necessary on share of mineral fertilizers. Since 1986, in 1st rotation grain-grass a crop rotation after transition on new soil-protective agriculture system, volumes of application of mineral fertilizers have been considerably reduced (about 103 kg/hectares of active substance), manure entering has increased to 100 t/hectares (a ameliorative dose) and there has been begun use of straw of all grain crops of a crop rotation on fertilizer (in compare 2,5 t/hectares annually). The expanded reproduction of organic substance and restoration of the lost agro physical properties of arable grey wood soil was the Overall objective of these receptions.

Now application of covering manure is reduced to 50 t/hectares, doses of mineral fertilizers in different years, depending on a condition of crops, vary from 40 to 110 kg/hectares kg of active substance, and their share in total amount of entering NPK averages 28.2 %.

Straw of grain and leguminous cultures is one of the cheapest, considerable on the volume, annually renewed, not demanding special expenses for manufacture, transportation and entering, a resource of organic substance and food elements. In agriculture system on Yuryev-Polish SESTV on fertilizer all straw of grain crops of a crop rotation is used, 4 is multiple for rotation 8-full grain-grass a crop rotation. It is crushed and Don-1500 with hinged grinders is in regular intervals distributed on a surface weeding simultaneously with cleaning of grain by combine СК-5.

Use of straw of the cereal cultures having the wide relation of carbon to nitrogen (C : N = 80-100), on fertilizer can be accompanied by display of a collateral negative effect of reduction of the maintenance of mineral nitrogen in the arable layer, connected with it immobilization the micro flora participating in decomposition of organic substance of straw, to the sizes negatively influencing for a crop. For optimization of a nitric food and indemnification iimmobilized nitrogen in system entering on the crushed straw of urea from calculation of 10 kg of active substance is provided N on 1 т straw.

Influence of straw on a crop of agricultural crops is substantially defined by time and its way incorporation. Negative action of straw marked sometimes on growth and development of plants decreases or is completely eliminated, if by the crops moment there have passed the first initial stages of its decomposition. In this case toxic action of products of decomposition of straw and negative effect immobilization of mineral nitrogen is eliminated.

On heavy loamy soils it is recommended to close up straw in top, most aerated, biologically active layer at once after cleaning of grain and straw crushing. In this case for warm enough and damp autumn period phytotoxic phenolic acids decay and to the beginning of spring sowing process remobilization nitrogen, immobilization in microbian plasma that eliminates possible decrease in a crop begins.

The crushed straw after entering of a compensating dose of nitrogen is closed up in top (0-12 cm) a layer of arable horizon by

heavy disk harrows of heavy disk harrow (BDT-3). After passage of the first stages of decomposition in 20-40 days chisel plow PCh-2.5 on draught T-150 is spent.

According to the received data, long application systems with regular incorporation in an arable layer of all crop of straw of grain crops of a crop rotation promoted optimization of indicators of fertility of grey wood soil (as a control variant of comparison the system of agriculture standard for the Vladimir region which took root on this field in 1968 - 1985 is taken). So, essential distinctions in level of biological activity of arable horizon of grey wood soil of a control site and a site with application agriculture systems are established.

The arable layer of soils was characterize stably by higher, than at traditional system of agriculture, indicators of number of all considered groups saprophytic micro-organisms: ammonifier, amilobacter, cellulose-fermenting, nitrifying, non-symbiotic nitrogen fixer, and also maintenances of a microbic biomass (Cmb) and total biological activity (Fig. 2)

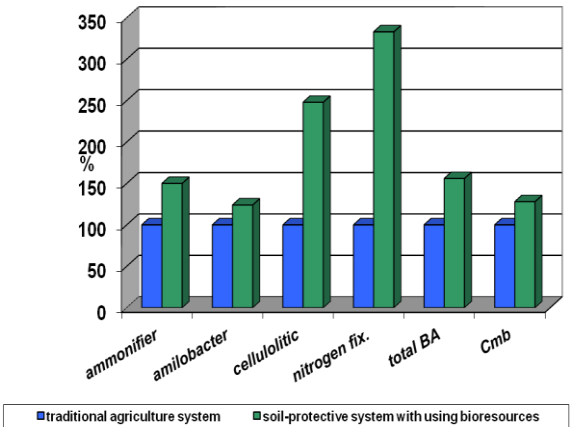

Fig. 2. Indicators of a biological condition of an arable layer of grey wood soil

Special interest number indicators cellulose-fermenting represent the microflorae which increase, as a rule, testifies to optimization soil agrochemical and physical properties and fertility as a whole [2]. Our researches have shown, that in a variant of long use agriculture systems with use of bioresources the arable layer of earth is characterized not only much higher (in 2,5 times) by number cellulolitic microorganisms, but also more various and their favorable specific structure. Prevalence here bacteria of sort *Cytophaga* testifies to high degree richness soils accessible for saprophytic microflorae organic substance.

According to the received experimental data, studied the system with use of bioresources with regular incorporation an arable layer of straw of all grain crops grain-grass rotation stimulates development anaerobic nitrogen fixing microorganisms *Clostridium pasterianum*. Their number in an arable layer of grey forest soil averages 15 thousand colony forming unit (CFU) in 1 g soils, whereas on sites, where the traditional system of fertilizer (without use of the vegetative rests on fertilizer, with low doses of manure), this indicator essentially more low, its size - at 4.5 thousand level CFU/g soils was applied.

Use of all straw of grain crops on fertilizer allows observing the law of "return" of organic substance. So, about 20 t/hectares of straw for crop rotation in soil arrive nearby 8 т carbon of the organic connections created as a result of photosynthetic activity of grain crops.

The analysis of humus balance in a studied crop rotation has shown that till 1986, prior to the beginning of development soil-protective agriculture systems, it was characterized by negative sizes that have been caused, mainly, low indicators reimbursement balance articles. The expense of humus on a mineralization of nitrogen and crop formation exceeded during this period its receipt at the expense of organic fertilizers and a root-stubble of the rests of cultures in 1.25-1.28 times (Table 1).

In 1st rotation from the beginning of introduction of new system of agriculture (1986-1993 of) mid-annual humus arrival at the expense of organic fertilizers (covering manure and straw grain) has increased almost in 3 times, and humus balance has made +1278 kg/hectares. In 2nd and 3 rotation manure entering has been lowered to 50 t/hectares, quantity a root-stubble of the rests has increased at the expense of increase in

crops of basic production on 11 (1994-2001) - 69 % (2002-2007), and the humus balance is characterize now by positive sizes +205 … +181 kg/ha.

Table 1. Balance of humus in soil, mid-annual indicators for grain-grass rotation, t/ha

Balance articles	Years				
	1968-1976	1977-1985	1986-1993	1994-2001	2002-2007
The expense	1163	1212	1347	1437	1614
Arrival, including:	907	966	2625	1642	1795
- debris rests	583	543	591	657	990
- organic fertilizers (manure and straw)	324	423	2034	985	805
Balance	-256	-246	+1278	+205	+181

Despite lacking row crops, the positive humus balance in grain-grass rotation is provided only with long-term bean grasses (a clover of 1st and 2nd year of using). For 2 years of cultivation their contribution to humus formation makes 2337 kg/hectares (26.6 %), at the expense of manure (50 t/hectares) in soil is formed about 3000 kg/hectares of humus or 34.2 %, for the account humification straw of grain crops - 3440 kg/hectares, or 39.2 % from total humus formed.

In 1984 the humus average maintenance in an arable layer of grey forest soil on fields made 2.6 % with considerable fluctuations from 1.6 to 5.0 % that specifies in the considerable agrochemical heterogeneity of a soil cover which are caused by integrated approach and being one of essential factors limiting productivity.

The data received in 2006, have shown increase in the humus average maintenance in an arable layer till 3.17, its variation thus has essentially decreased, the minimum value has made 2.65, maximum - 3.86 %.

Studying of qualitative structure of soil organic substance has shown, that the applied system of agriculture with rational use of bioresources not only has raised the maintenance of humus, but also optimized it agronomy valuable indicators: promoted a new growth and accumulation of labile forms humus substances (carbon labile humus - in 1.45; extracting hot water carbon - in 1.83; mort mass - in 1.33 times), capable to fast transformations and supply of plants by nitrogen and other elements of a food, and closely correlating with productivity of plants (Table 2).

Table 2. The maintenance of labile forms humus substances in arable grey forest soils

Option agriculture system	C org., %	Ceh w	Clh (0.1 m $Na_4P_2O_7$ pH = 7)	$C_{alkaline}$ (0.1 n NaOH)	mort mass, C g/hectare
		mg/kg of soil			
Traditi-onal	1,51 100	300 2.0	1550 10.3	2170 14.4	1800 4.0
Soil - protective	1,84 100	550 3.0	2250 12.2	3110 16.9	2400 4.3

Below the line – content in Corg., %

These humus forms as show the experimental data received by many researchers, define speed and capacity of biological circulation, fund of accessible elements of a food of plants, serve as the basic energy source for realization of microbiological processes, including, nitrogen fixation, support a favorable physical (structural) condition of soils.

CONCLUSIONS

Thus, results of scientific researches and long-term practical experience of application soil-protective systems of agriculture with rational use of agrocenosis bioresources on Yuryev-Polish SESTV have shown its high efficiency concerning optimization of humus indicators and a biological condition of arable grey forest soil.

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THE POTENTIAL DEVELOPMENT OF ECONOMIC-AGRICULTURAL ZONES INFLUENCED BY SUBSIDIES AND INVESTMENTS

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Abstract

During the transition period continued deepening regional disparities in development between different parts of the country, mechanisms and market relations by claiming their advantages and disadvantages. The impact of the existence of these gaps is the deterioration mechanisms of interaction and increased economic disparities between different areas. The existence of socio-economic disproportions territorial is determined by objective and subjective reasons, natural and cyclical factors. But it is indisputable need for disposal.

Key words: *agricultural policy, agricultural sector, agricultural zone, economic growth, investment, land resources, stimulation.*

INTRODUCTION

Physical and geographical conditions exert a significant influence over the country's economic potential and specialization. Although the country has relatively small surface and its area is compact, there are highlighted specific territorial features caused by the differences of natural conditions, the specialization of agriculture and the processing industry and demographic features.

On the assumption of the of climate type, topography and soils, territorially Moldova is divided into several of natural territorial complexes of different levels. Each of these tends to develop on account of foreign investment and subsidies provided by the state.

MATERIALS AND METHODS

In the results of the economic and statistical, constructive calculation and logic observation methods were used. As the informational support there served the financial reports of National Bureau of Statistics, of the Ministry of Agriculture, Ministry of Finance and Project Expert Group supported by the Soros Foundation-Moldova. The methodological base was based on multiple legal and normative acts of the Republic of Moldova. The basic methods of the research are the analysis and synthesis, the method of comparison of the average sizes, the tabular method and the graphic data interpretation.

RESULTS AND DISCUSSIONS

On the assumption of the natural conditions there can be identified that Republic of Moldova is divided into three agricultural regions: North Zone, South Zone and Central Zone. Each of these areas is specialized in certain crops depending on climate and soil. [2]

Tabel 1. Agricultural region specialization

Agricultural region	Specialization
North Zone	Sugar beet, cereals, sunflower and fruit, cattle and pigs breeding
South Zone	Viticulture, cereals, sunflower, sheep and cattle breeding
Central Zone	Vineyards, orchards and cattle, vegetable.

Source: elaborated by author.

Given that the fact that the agriculture has an central role in the economy of country districts, agricultural land is a basic element of their potential. In this context, it highlights the differences between districts regarding the availability of land resources. Thus, if the Taraclia inhabitants has on average 1.2 ha of agricultural land, in Chisinau, Balti and Ungheni there are only 0.6 ha. According to this indicator, the southern regions of the

republic are favored in a way, due to the lower population density. Respectively, the hierarchy of districts according to the agricultural production per capita correlates with the distribution as agricultural land per person. Contribution to the total agricultural production of the districts broadly correlates with the size of their territory.

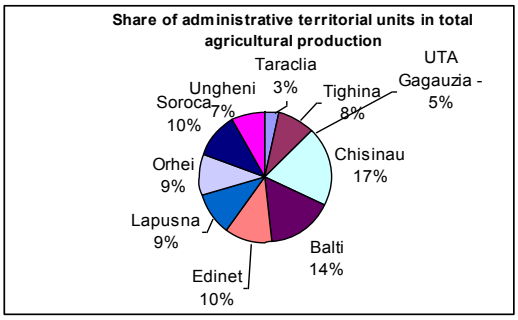

Fig. 1. Share of administrative territorial units in total agricultural production
Source: Regional Development: Republic of Moldova versus the European Union

During the transition period the regional disparities in development between different parts of the country continued deepening, mechanisms and market relations being claimed to as their advantages and disadvantages. The impact of the existence of these gaps is the deterioration of the mechanisms of interaction and increased economic disparities between different areas. The existence of the territorial socio-economic disproportions is determined by objective and subjective reasons, natural and conjectural factors. But the necessity of their elimination is indisputable.

Subsidies received during 2006-2009 by the Balti, Donduseni, Ocniţa, Cantemir, Râşcani districts producers were 5 times higher per capita than those granted to farmers in Nisporeni, Calarasi, Străşeni, Teleneşti, Ialoveni. Statistics show that during 2006-2011, Balti, Ocniţa and Donduseni regions were the top-ranked for the allocation of subsidies in agriculture. In 2012, the first three regions with the largest amount of subsidies (in absolute terms) were Briceni (22,2 mil), Autonomous Territorial Unit of Gagauzia (20,3 mil) and Anenii Noi district (20 mil). Together, these three regions have accessed the sum of about 63 million lei. In turn, they were followed by the Edinet (18,2 mil), Drochia (17,8 mil), Floreşti (16,8 mil), Cahul(16,2 mil), Soroca (16,1mil) and Rîşcani (15,5 mil). At the last positions were placed the Nisporeni (3,88 mil), Basarabeasca (3,19 mil) and Dubasari with 2,86 million. Furthermore, in the past six years, there is a tendency of receiving the least amount of grants from the Subvention Fund by the Nisporeni, Calarasi and Hânceşti. [1]

Analyzing the distribution of the Subvention Fund between the farmers in agricultural areas in the period 2006-2012, and the data presented above, we notice that the North regions have accessed by 8-10% more grants than the Central Zone and 16-17% more than the South.

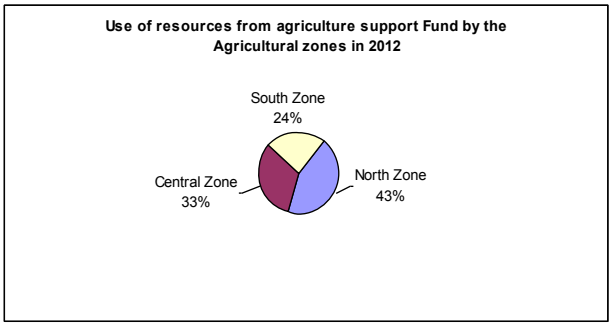

Fig. 2. Use of resources forom agriculture support Fund by the Agricultural zones in 2012.
Source: Prepared by author based on data from the Expert-Grup project

Zone-specific analysis of medium subsidiary amount in areas shows that in 2012 North Zone producers have received subsidies 211,21 lei/ha, that is 46,76 lei/ha more than the farmers of the Central Zone and 35,41 lei/ha than those in the South.

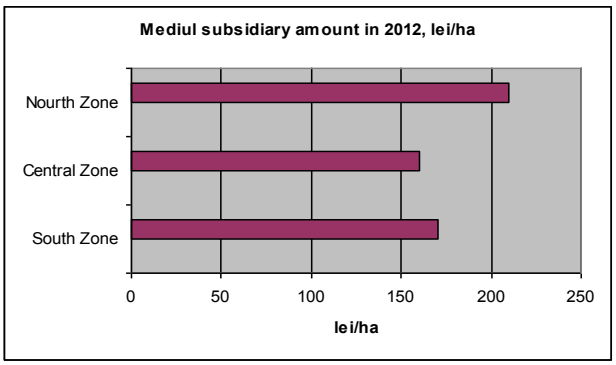

Fig. 3. Medium subsidiary amount în 2012
Source: Prepared by author based on data from the Expert-Grup project

The agricultural producers from Soroca received subsidies in amount of 469,9 lei/ha, those in Briceni – 359,3 lei/ha, while those in Calarasi only 64,8 €/ha. [1]

Regarding the directions for use of the Fund for the agricultural sector, each agricultural area develops its particular sectors. Analyzing the activities in the period 2006-2009, The North Zone targeted the subsidies primarily for growing sugar beet, hedging and purchase of agricultural machinery and irrigation. The Centre has supported the development of orchards, nuts and livestock growth and the Southern – fruit and livestock.

Along with grants provided by the state budget, each district or rural area tends to develop agriculture through investment. In an important role in realizing the investment projects have economic agents. Farmers' own resources for investments in fixed capital, fixed assets renewal and expansion of the technical production is insufficient and partially filled by borrowing resources from commercial banks. Under these conditions, foreign investments that are virtually limitless can become source of investment increase. In 2010 the Compact Agreement which provides a grant of U.S. $ 262 million to the Republic of Moldova by the U.S. Government through the Millennium Challenge Corporation (MCC) entered into force.

This project is available exclusively for agricultural producers and producer groups, cooperatives, associations, exporters and other actors in the agricultural value chaing from Criuleni, Orhei, Anenii Noi, Dubasari, Nisporeni, Ungheni, Leova and Cahul. In 2015, 11 irrigation systems with the ability will be put into operation to serve 15000 ha of agricultural land in these districts (3000 farms). [3]

Reform of Irrigation Sector and Transition to High Value Agriculture Project (PTAP) includes since the November 2012 the loan program for investment in post-harvest infrastructure . Investments can be accessed by farmers in the districts mentioned above, but also in other districts of Moldova, which plan to invest in the mentioned districts. Purpose of the loans offered by Compact remains unchanged: the purchase or construction of cold storage (including refrigeration equipment) and related land acquisition, purchase of equipment for the processing and sorting of fruit, vegetables and grapes, purchase of laboratory equipment for quality control, etc. The loans are granted by Moldova Agroindbank, Social and Comertbank, Moldindconbank, Mobiasbank, Victoribank, Energbank. So far they have been disbursed 21 loans totaling $ 4,3 mil, including 16 loans totaling approximately $3,2 mil (about 75%) invested in the construction or cold storage for fruits, vegetables, grapes with a total capacity of about 16500 tons. **[3]**

In order to improve conditions for the development of agricultural enterprises and increase income generation and economic investment in rural areas, IFAD project offers the economic groups, grants in amount of max $ 200 on a competitive basis for development of rural public infrastructure with economic caracter. The IFAD-5 project is intended to cover the financial demand to provide financial services for agricultural producers in sum of $ 19,5 million. So far, with this Fund were planted 1994 ha of fruit trees and 1518 ha of vineyards . At the same time there were built 70 refrigerators with a capacity of over 30000 tons and were acquired 327 agricultural machines, including tractors and combines. Among the beneficiaries of these investments can be enumerated "Gospodarul Rediu" LLC from Falesti ,, SoroAgro" LLC in Edineti "Vindex -Agro" LLC from Orhei and "Podgoreni" LLC from Cantemir. [5]

PNAET Program is a program for young people who want to develop their entrepreneurial skills to launch or expand a business in agriculture or manufacturing. Thanks PNAET were procured 395 tractors, 312 - agricultural equipment, other machinery, computers for consulting services in agriculture. From the geographical perspective the most active region in funds withdrawal is the North Region of the country with 421 sub-projects or 59,84% of the total number of sub-projects awarded, followed by the Central region with 149 sub-projects or

20,57% and the South with 144 sub-projects or 19,59%, taking in consideration the participation of all localties.[6]

CONCLUSIONS

The socio-economic development of the administrative territorial units in the Republic of Moldova is influenced by many factors, the most important being physical-geographical potential, speed and scale of economic and social reforms, the level of development of market mechanisms and the ability of local elites to adapt and act in new realities.
These factors conditionate appearance of disparities in socio-economic development of the territory. But it is necessary to provide equitable financial support from the state to develop the farmland of Moldova proportionally. This refers also to the orientation of investment in agriculture. Currently, the Central Zone and South Zone accesse fewer state subsidies , one of the reasons being influence of governing parties over the allocation of funds. Such influences inevitably lead to a greater differentiation in economic development of the administrative territorial units of the Republic of Moldova

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HOW TO DETERMINE THE AMOTIZED COST OF BANK CREDITS ACCORDING TO THE EFFECTIVE INTEREST RATE METHOD IN THE CONTEXT OF TRANSITION TO IFRS (INTERNATIONAL FINANCIAL REPORTING STANDARDS)

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Abstract

It is known that licensed banks in the Republic of Moldova are in the period of fulfilling the action plan with a view to implementing the project on transition from the National Accounting Standards to the International Financial Reporting Standards (IFRS). Fair and timely decisions are only possible based on objective and successive information, which explains the need for IFRS. At the same time, a major role in popularization of IFRS is played by the specialized publications. Therefore, this article aims at highlighting genuine financial information, transparency, comparability of accounting data and will increase reliability of financial statements of licensed banks. In conclusion we report that when calculating the effective interest rate, the bank estimates cash flows considering all contractual terms of the credit, but does not take into account future credit losses. The calculation includes all commissions and points paid or received by contractual parties that are an integral part of the effective interest rate, transaction costs and all other premiums and discounts.

Key words: *commission, credit, depreciated cost, effective rate, interest*

INTRODUCTION

Transition to the International Financial Reporting Standards should be regarded as a particularly important reform for the country development. As a step in the context of European integration, it primarily targets financial-accounting professionals who should assist the Government to achieve this goal of strategic importance for the Republic of Moldova. In Moldova, IFRS will also be applied by public interest entities which do accounting and prepare financial reports under IFRS. These also include the licensed banks. In this context and in order to ensure implementation of the action plan for the transition to IFRS, the bank recognizes a financial asset in the statement of financial position when, and only when the bank becomes party to contractual provisions of the instrument. When a credit is initially recognized, and the bank uses the settlement date accounting for this credit, the bank assesses it at its fair value plus transaction costs on the trade date. In accordance with the International Accounting Standard (IAS) 39 "Financial Instruments: Recognition and Measurement" [6], the bank will reflect the following financial instruments at amortized cost: credits, loans and securities held to due date. This is why, the original disbursed credit amount should be reduced by the amount of commission and other related fees, which are included in the amortized cost of the credit. Hence, commissions that are not included in the initial cost of the credit must be included in the income of the management period.

MATERIALS AND METHODS

In The research has been conducted on the basis of generalization of problems and mismatches arising from the implementation of the action plan for Moldova's transition to IFRS. The Accounting Law no. 113 - XVI from 27 April 2007 [1],
Law on the National Bank of Moldova no. 548 - XIII [2], Law on Financial Institutions no. 550 - XIII In [3], provisions of IAS 18 "Revenue" [6], the Regulation on Lending

Activity of Banks operating in RM [5], the Regulation on Classification of Assets and Engagements [4] served as methodological support for investigations. Data provided by the licensed banks JSC "Banca de Economii", CB "Victoria Bank" JSC, CB "Moldova AgroIndBank " JSC served as the basis for empirical research. Preference was given to the monographic study method with elements of analysis, observation, selection, induction and deduction.

RESULTS AND DISCUSSIONS

In accordance with International Accounting Standard (IAS) 18 [6], commissions which are incorporated in the effective interest rate of a financial instrument are usually interpreted as adjustments to the effective interest rate. The following commissions will be included in the effective interest rate calculation and the amortized cost of the credit: commissions for credit granting, periodic commissions for credit granting from the credit balance (quarterly, yearly, etc. depending on the terms of the contract); credit management commissions, if these are determined as % of the amount owed by client; credit extension commissions; credit restructuring commissions.

Commissions collected and recorded as provided services (postponed and unamortized) and which will not enter into the calculation of the effective interest rate and the amortized cost include: commissions for credit file examination (the bank assesses this income as insignificant); pledge appraisal commissions (bank assesses this income as insignificant); account management commissions (if existing), if these equal to a fixed amount independent of the amount owed by the client; commissions for not using the credit line; credit prepayment commissions; payments related to failure of the debtor's contractual obligations; commissions for cash receiving / repayment of credit, including the use of automated teller machines (in case these conditions are required by the creditor).

If the bank determines that credit is granted at an interest rate significantly different than the market interest rate [5], the credit value to recognition will be equal to the value of future cash flows, discounted using the effective market interest rate. The difference between the fair value of the credit and the contract value is recognized as expense, income, capitalized assets, as appropriate. In accordance with International Accounting Standard (IAS) 39 "Financial Instruments: Recognition and Measurement" [6], amortized cost is calculated using the effective interest method. The effective interest rate is the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial instrument to the net carrying amount of the financial asset or liability. Financial assets that are not carried at fair value though profit and loss are subject to an impairment test. If expected life cannot be determined reliably, then the contractual life is used. IAS 39 [6] permits entities to designate, at the time of acquisition or issuance, any financial asset or financial liability to be measured at fair value, with value changes recognised in profit or loss. This option is available even if the financial asset or financial liability would ordinarily, by its nature, be measured at amortised cost – but only if fair value can be reliably measured.

When calculating the effective interest rate, the bank estimates cash flows considering all contractual terms of the credit, but does not take into account future credit losses. The calculation includes all commissions and points paid or received by contractual parties that are an integral part of the effective interest rate, transaction costs and all other premiums and discounts. It is assumed that cash flows and expected life of a group of similar financial instruments can be reliably measured. However, in those rare cases when it is not possible to reliably estimate the cash flows or expected life of a credit (or group of credits), the bank uses contractual cash flows for the full contractual term of the credit (or group of credits). Applying the effective interest method, any honorary, points paid or received by the counterparties, transaction

costs and other premiums or discounts included in the calculation of the effective interest rate over the expected life of the financial instrument, are cushioned.

Effective interest rate is calculated from the first credit installment under contractual cash flows. For credit contracts with a fixed amount and repayment term, the table of credit cash flows will be worked out including:

- loan disbursement by the customer's bank;
- credit repayment by the customer;
- payment of commissions by the client. All commissions entering the credit amortized cost will be included;
- payment of interest.

For credit contracts with indefinite cash flow (lines of credit, revolving credits, overdrafts, credit cards), assumptions will be made based on condition that principal disbursement of the customer's bank will be in the amount of credit contract and principal repayment by the customer to the bank will be made in equal installments with the difference between maximum amounts of customer's debt stipulated in the credit contract.

The effective interest rate must be calculated using the numerical methods of mathematics such as the internal rate of return based on cash flow for each credit contract:

$$\sum_{i=0}^{N} \frac{FTn}{(1+RED)^{\frac{Ti}{360}}} = 0,$$

where:

N - the number of cash flows until the full payment of the credit;

FTn - sum of payment *n* in the cash flow;

RED - effective interest rate;

Do - first payment of the cash flow;

Di - date of payment *i* of cash flow;

Ti = (Di-Do) – number of days from the first payment of cash flow till the date of *i* payment.

In order to calculate the effective interest rate, equal periods of 30 days are used. There are 12 periods in the year (360 days in the year, 30 days in month). The first period is considered the end of the first month after the first grant, for calculating the effective interest rate, the first period is considered 30 days. The last period is considered the end of the credit due month (number of periods for calculating the effective interest rate may not coincide with the number of months of the credit contract action).

Effective interest rate method does not apply to credits with repayment period less than one month (overdrafts, lombardy) or in the case of bank cards - less than two months and for credits without fees for issuing credit loans. If the credit term has become more than a month (or 2 months for bank cards) after extension, the effective interest rate method does not apply.

For calculating the amortized cost of the credit based on expected future cash flows and due date of the credit, the effective interest rate computed at initial recognition (on granting of credit) is applicable.

For floating rate credits, periodic re-estimation of cash flows in order to reflect movements in market interest rates, the effective interest rate is changed.

The initially calculated effective interest rate will remain unchanged throughout the credit period, unless the contractual interest rate changes. When revising the interest rate of floating rate credits, the following will be done:

- the payment chart (cash flow) for subsequent period, which shall include: the amortized cost when the interest rate changes, future cash flows (calculated according to the new rate);
- based on this chart, the effective interest rate will be recalculated;
- the recalculated rate shall be used to calculate future interest income.

Therefore, the amortized cost calculation will be performed for each credit contract that is included in the bank's credit portfolio, excluding credit contracts paid from the allowance for credit losses, which will not be included in the balance sheet at 01.01.2013, for credit contracts less than or equal to 1 month (2 months for credit cards) and for credit contracts for which no commission is charged for issuance of credit and for which the nominal rate is received by the bank as the effective rate of interest.

Recognition of commissions as adjustment to the amortized cost of a financial instrument means that revenues and costs are not directly recognized in profit and loss account on receipt/registration. These are postponed and included in the amortized cost using the effective interest method and, therefore, amortized through the profit and loss account over the life of the instrument. They are part of the interest income.

CONCLUSIONS

When calculating the effective interest rate, the bank estimates the cash flows considering all contractual terms of the credit, but does not take into account future credit losses.

Effective interest rate method does not apply to credits with repayment period of less than one month and for credits with no commissions for issuing credit. If the credit term has become more than one month (or 2 months for bank cards) by extension, the effective interest rate method does not apply.

Amortized cost calculation will be performed for each credit contract that is included in the bank's credit portfolio, excluding credit contracts paid from the allowance for credit losses.

For calculating the amortized cost of the credit based on expected future flows and the due date of the credit, the effective interest rate computed at initial recognition (the granting of credit) is applicable.

Applying the effective interest method, any honorary, points paid or received by the counterparties, transaction costs and other premiums or discounts included in the calculation of the effective interest rate over the expected life of the financial instrument, are cushioned.

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PROFITABILITY A SUBSYSTEM WITHIN THE GENERAL SYSTEM OF ECONOMIC EFFICIENCY FOR AGRICULTURAL EXPLOITATIONS

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Abstract

Under market economy conditions purchasing profitability represents a rule for each and every market player. It represents an essential condition of the existence of economic units. Survival of the enterprise and assuring its profitability are "the first concerns of every skilled leader. They are valid in each and every moment, right from the enterprises foundation. Thus profitability is a tool for decision making regarding internal administration of the economic unit, as well as in relation to external partners. It is the synthetic expression of results of any nature, an index for decision making and entity behaviour.

Key words**:** *agriculture, economic efficiency, indices, profitability*

INTRODUCTION

Under free market economy conditions the purpose of the activity of economic units is profit subordinated - but not in the sense of obtaining an absolute maximum profit at any cost, but in the context the demands and requirements of sustainable development of the economy – profitability represents a sine-qua-non condition, for the very existence of economic units. Therefore, profitability becomes an instrument underlying the decisions regarding internal management of economic units and their relationship with the external environment, acquiring the capacity to be a key criterion for assessing economic efficiency [7,8].

MATERIALS AND METHODS

In this paper, the concept of profitability is defined based on the information provided by literature and a critical approach is made by authors using analysis and synthesis methods.

RESULTS AND DISCUSSIONS

It should be noted that the two concepts – economic efficiency and profitability - are not identical.

Taking into consideration that every phenomena, process or economic activity has a quantitative determination, given by the size of consumption costs, the effects obtained, it was concluded that efficiency as a qualitative characteristic, would be nothing more than the ratio between effectiveness (outcome) and expenses incurred in obtaining it.

This goal is expressed mathematically by the ratio of the effects obtained (in physical or monetary expression) and efforts conducted (resources used and consumed) [1].

$$\varepsilon = \rightarrow \text{effort / effect} \rightarrow \max$$

Some authors10 [2] show that efficiency can be calculated by relating efforts to effects.

$$\varepsilon = \rightarrow \text{effect / effort} \rightarrow \text{minimum}$$

Economic efficiency is expressed nowadays in the form of specific input consumption in order to obtain the desired effects, reflecting the consumption of inputs that returns per unit of useful economic effect, or as yield combination and use of inputs, in this case reflecting the economic effects produced per effort unit.

Economic efficiency means "performances of the analyzed economy, characterized through a system of indexes". [3]

Within the indexes system we need to calculate in addition to values which have the advantage of synthetic, aggregated expression) and those expressed in physical

units (natural or natural-conventional) which allow easier interpretations and easy comparison.

Measurement in absolute size of the economic efficiency is achieved through the difference method, thereby obtaining intermediate management balances: value added, turnover, operating profit, financial profit, exceptional profit, net profit.

In the relative assessment of the efficiency, efficiency indexes are being used, obtained by relating effects to efforts (useful effect per trained unit) and by reporting the effort to the effects obtained (specific cost in order to obtain a unit of effectiveness). The nature of the effect gives us different forms of efficiency: production - productivity savings - economy, profit - profitability.

In agriculture, the specific activity is given by the role land takes in the production process. In examining the economic efficiency the degree of capitalization of the productive potential of the land, the resources available in the soil, with the help of a specific set of indexes such as: the average yield per hectare, by crop type, expressed by the production in natural units (tones), per unit of cultivated area, the production value or the net income per unit area, intensive land use, the coefficient for intensive use of the land, obtained by reporting the area added related to land categories, transformed in land area converted into conventional arable land, to the total area (national).

These indicators are distinguished by the specific form of expression and quantification of efforts and effects and the unique economic content.

There are cases when efficiency is assessed as effort / effort and effect / effect, obtaining structure indexes: 1000 lei revenue benefits, the commercial profitability rate, the degree of technical equipment work. Some economists, however, dispute that these would be efficiency indexes.

In general, the decision maker rarely uses the entire set of efficiency indexes, selecting those who best match its priority analysis.

Economic efficiency is manifested and analyzed under special and/or sector forms, such as: efficiency of industry, agriculture, transport, education, construction, as well as general-synthetic forms such as production, circulation, distribution and consumption efficiency.

All these forms are in close interdependence at all levels of reference at national economy, even at global economy. The national criterion for assessing economic efficiency is the national productivity, while the **individual criterion is represented by the profitability.**

The entire system of economic efficiency indexes is grouped in subsystems, among these appears also the profitability indexes subsystem.

Therefore, the concept of economic efficiency has a much broader scope than the concept of profitability, as it concerns the whole system of indexes which reflect various specific forms of economic efficiency, system in which also the profitability indexes subsystem is contained. Compared to other subsystem indexes of economic efficiency, the profitability indexes subsystem has a higher degree of integration, of reflection of the economic and financial results. Indexes of economic efficiency of various subsystems constitute in factors that, together with other quantitative, qualitative or structure factors determine the amount of profit and the rate of return.

Between the two concepts - economic efficiency and profitability - exists a report "as from the whole to part of this whole". [4] Increasing economic efficiency is closely related to increasing the company's profitability, to the continuous strengthening of the profit role. Systematically analyzed, profitability represents the particular and efficiency the general phenomena and socio-economic processes [5].

Thus, as noted by Prof. Dr. Al. Gheorghiu [6], profitability takes into account only the resources consumed (in terms of effort) at analysis level of the producing enterprise and not the entire resources system attracted in the economic cycle, as is the case of economic efficiency. Also, regarding the effect, profitability concerns only what is obtained at the analysis level, irrespective of macro

system-interests, of the other companies that will buy the final product, of the final consumer.

The efficiency category has a higher degree of synthesis then the productivity, profitability, cost, economy category, all being manifestations of the economy of time law. It has a systemic character, determined by the complexity of relationships between the economy of time law and other economy laws, links between efficiency and other economic categories (productivity, cost, efficiency, and economy category).

Reflecting as a report between effects and resources and vice versa, and the assessment of these reports being made only relatively, compared to other versions of the same activity, for example the efficiency standards set by the national economy, we find the double relativity that characterizes efficiency.

Evaluation and assessment of the economic efficiency is carried out according to the time evolution of resources and effects, even when the calculation is made at a certain time. This condition reflects the perspective character of economic efficiency.

Space propagation of effects elements and resources requires that effectiveness should be assessed only in terms of national economy as a whole, even if it is one of its forms of expression, requiring the causality effects / resources identification, at national economy scale, assessing the results and effort elements, both downstream and upstream from the activity analysis place.

Through this it is found that profitability has only a space determination and not a systemic space-time determination, such is the case with efficiency.

Correlation between profitability, effect and efficiency should be studied also from other points of view:

• Profitability and efficiency are based on mutual incentives reports, also according to the price system used. Each projected sale price corresponds a certain amount that must not be exceeded.

This is the company's supply curve, which shows the amount that the firm is willing to sell at each possible price. On this curve, the company realizes profits and maximum profitability.

• Impact on export product.

• Profitability, efficiency and increasing the degree of culture must be consistent.

Profitability is a purely relative concept: profits can not be meaningfully assessed only in relation to the funds invested for their production: total assets, equity. Thus, profitability is a multifaceted concept, each expressing a side of the business efficiency.

The total output of the company's activity in all stages of the economic cycle is reflected in the profit and rate of return - one of the most synthetic efficiency indexes of the business activity. [6]

Compared to other subsystems of economic efficiency indexes, the profitability indexes subsystem is characterized by a higher degree of synthesis and reflection of economic and financial results, with particular cognitive meanings.

Profitability and efficiency are in a mutual stimulating report. That is, the economic efficiency indexes of various subsystems are being constituted in factors that, together with other quantity, quality and structure factors determine the actual profit amount and the rate of return. Thus, distinguishing between efficiency and profitability, we can say that "it is not possible to be profitable without being at the same time efficient" [8]. It is however possible for a company to be efficient without being at the same in time and profitable. This happens when, although technically well equipped, it has difficulties to adapt to market conditions.

Thus, profitability is a form of efficiency at microeconomic level, which reflects the net effects obtained per effort unit with inputs. It reflects the ultimate economic efficiency of the entire financial and economic activity, being a **"true quintessence of all facets of economic efficiency" [4].**

CONCLUSIONS

Profitability is a purely relative concept: profits can not meaningfully be assessed only in relation to the funds invested for their

production. It expresses "the efficiency of financial and material resources invested in the overall activity of the enterprise, measuring the profitability of the assigned means, more precise their relative ability to make profit. [10]

The profitability concept is applied to farms with all the specifics belonging to the present agriculture.

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PROFIT – THE ABSOLUTE EXPRESSION OF PROFITABILITY

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Abstract

*Profitability of an economic unit is expressed through **a system of indicators**, because "no index or economic category can reflect the total, perfect, complex reality of economic phenomena or processes. Each expresses a side of concrete, essential details (indexes), but a full one (economic category). This system of indexes for profitability is characterized by a higher degree of consolidation, of reflection of the economic-financial results. They must be correlated to the other indexes of economic efficiency from the various subsystems that constitute the factors which determine the actual amount of profit and the rate of return. Each indicator has a certain form of expression according to the phenomena to which it refers. Thus, they can be expressed in relative sizes as medium sizes or indexes. They can also be expressed in physical, conventional or value units. The ability to develop monetary results can not be judged independently to the employed means for achieving them. Therefore, the profitability analysis is not limited to investigating its absolute indexes but also the relative ones, obtained by comparing the results to the means employed or consumed for developing the specific activity*

Key words*: *economic, economic profit, normal profit, profit

INTRODUCTION

Etymologically, the term profit has a Latin origin, from the verb *proficere*, that means *to progress, to give results*.
The profit concept has been given a great attention in all thinking systems.
Thus, mercantilists (J. Bodin, Th. Hurnn, J.B. Colbert) have considered that "the purpose of every business activity, including commerce is profit, which is being gained in the process of goods movement by money means as a result of the difference between the sales price and the (lower) purchase price". [2]
Physiocrats such as Fr. Quesnay, A.R.J. Turgot, rejecting the mercantilist conception regarding the origin of profit in trade, felt that the added products and so the added value over the expenses incurred can be created only in production, more precise in one main branch, such as agriculture.
The classic, A. Smith, believes that the profit is the income of the capital owner, because "its size depends, not on what could be called as the employer's work, but the capital amount available to the employer". [2]
For K. Marx, profit is a manifestation form of added value, as part of the value created by paid workers, that other social groups acquire (capitalist employers in the form of profit, bankers in the form of interest and owners in the form of rent land). [2]
According to some relatively recent papers [3], in market economy countries the *profit* term is being used, excepting France, which uses the term *beneficial* and Italy - *beneficio*.

MATERIALS AND METHODS

The concept of profit is approached as an absolute expression of profitability [1].
The critical review is based on the information provided by literature and using analysis and synthesis methods.

RESULTS AND DISCUSSIONS

At national level, profit is being defined and interpreted in various forms.
The profit concept is seen, accepted and understood differently by economists in terms of global concept, as a resultant of economic

effort (cost of production) and the effect resulted in revenue.

In order to obtain profit, every time total revenues must exceed total expenditures.

Looking at it in this way "profit can be defined as a surplus of revenues over cost level", it is "the positive difference between earned income, by selling goods made by an economic agent and their cost, considered as an expression of economic efficiency." [4]

Profit is being presented "as net income of the company, as a surplus over costs made by the unit, in order to claim its total returns." [5] It is "a component of the sales price of goods or services produced by the firm, the final price is determined by the supported profit margin (share). "[6]

The common goal of all economic agents is to obtain profit. The viability of this goal depends on their ability to accurately predict the possible alternatives for development of their economic activity. Running the entire production process, market research, obtaining the desired price depending on market demand, involves a number of uncertainties and risks.

From this point of view, profit "is a consequence of the risk, a reward that the economic agent can receive for risking its capital, it is the result of predicting the future with greater accuracy than most of the others (competitors) did" [7]. In this regard, profit can be regarded as "a compensation for the risks that the entrepreneur may have in developing the economic activity, evidenced by loss of capital" [8].

Profit is a positive real value resulting from economic or financial-monetary processes combined with market
demands, a value accepted by both entrepreneurs and state, representing for
both parties "the essential source of necessary funds for consumption and development" [9].

For the economic analysis of the activity of an enterprise it is important to understand the following terms:

-***The accounting profit*** which represents the excess of net income over the accounting cost. It is called by some authors official, legal and statistical profit. This profit is being calculated as a difference between "active" in the balance sheet at the end of the fiscal year (reduced by the related obligations). From this difference the share in capital operated during the year and income established by law as being non-taxable and by law non-deductible expenses are being added and other items provided in the balance sheet, depending on the specific activity of the taxpayer. The profit calculated such as, is also called *legitimate* or *legal*, that is, "the monetary surplus obtained in compliance to the account methodologies and all legal rules in force". [9]

-***The economic profit*** represents the difference between total income of the company and the opportunity costs of all inputs used by it in a period of time.

-***The normal profit*** consists of a minimum of return that a company must obtain, in order for it to remain in service. In this case, the total revenue received equals the total opportunity costs. Prof. Dr. T. Gherasim considers that a normal level of profit allows the operation of the company in terms of profitability, but without making the economic sector "attractive" to other competitors [10], which means that based on receipts, one can provide further activities at the same operating parameters.

-***The over profit*** is a net income exceeding total opportunity costs. It is an
additional profit, considered in comparison to a normal profit. Nature and
forms of the comparison basis (normal profit) determine the nature and forms of over profit[11]: entrepreneurial over profit, extra-entrepreneurial over profit.

Both the accounting and the economic profit can be regarded as normal and as over profit.

Whatever the form of profit, it expresses the revenue obtained from an economic activity in progress, it being both the result of the progress and as well its factor. [5]

Unlike other forms of income (interest, rent, salary), profit is random and independent. Looking at it this way, profit is a clue of economic rationality, a motivation for development and technical progress, an exciting factor of the increase in effort for the

economical agent for efficiency and higher quality.

Profit is one of the most synthetic indexes of the economic activity of enterprises. It summarizes almost all of its economic activity: supply, production, marketing and results from other activities.

The analysis of enterprise's profit aims the overall study of the dynamics and structure of profit, highlighting the activities and cost-effective products, highlighting and capitalization of internal resources in increasing their permanent profitability.

Reflecting the company's efforts to increase economic efficiency, profit is a useful indicator in assessing the economic activity, but not enough.

CONCLUSIONS

Profitability is expressed in **absolute value through profit** (a volume index) and in relative value by the rate of return (an index that measures the extent to which the use of various resources generates profit), the two issues being linked to each other, having a correlative character.

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MONITORING AGRICULTURAL PLANTATIONS WITH REMOTE SENSING LANDSAT IMAGERY

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Abstract

In agriculture, a major benefit of satellite registrations crop is forecast problem by following up the development of crops in certain phenological stages. Then, the registration of pest attacks made possible intervention in the early stages of this phenomenon. Development of the Earth's surface registration techniques in different spectral bands, specialized for certain components of the environment. Such as those of the last LANDSAT and SPOT satellites were able to follow some aspects of forestry and agriculture

***Key words*:** *agriculture, agricultural plantations remote sensing spectral bands, vegetation*

INTRODUCTION

Remote sensing refers to the registration activities, observation and perception of distant objects or phenomena. In remote sensing, sensors are not in direct contact with objects or phenomena observed. Electromagnetic radiation is normally used as a carrier of information in remote sensing. Product sensing system is usually an image representing the scene observed. An important step is the image analysis and interpretation necessary to extract useful information from the image. In a narrower sense, remote sensing refers to the science and technology necessary for acquiring information about the Earth's surface (eg, the earth's surface, oceans and atmosphere) using sensors on board of vehicles (airplanes or balloons) or space (satellites and space shuttles) platforms. Depending on the scope, remote sensing can be divided into

(1)Remote sensing satellite (when used satellite platforms)

(2)Photography and Photogrammetry (when used to capture visible light images)

(3)Thermal remote sensing (when used infrared spectrum)

(4)Remote sensing using radar (when using microwaves), and

(5)LIDAR (laser pulses are used when they are transmitted to the ground and the distance between the sensor and the ground is measured based on the return time of each pulse).

MATERIALS AND METHODS

The spectral response of vegetation is identified by the reflectance's spectral curve and depends on the health of the vegetation. The curve has an allure that has maximum and minimum. Minima in the visible portion of the spectrum are due to the chlorophyll pigments in leaves. The chlorophyll absorbs energy in the wavelength range 0 45 to 0.67 μm. Therefore vegetation health is perceived as green. Vegetation absorbs blue and red rays and reflects them on the green.

The reflection is performed in the wavelengths' band of nearby infrared from 0.69 to 1.3 μm. During this time plants reflects 40-50% of the incident energy on them. Foliage reflectance is achieved in the range of 0.7 to 1.3 mm, and depends on the internal structure of the leaf. Measurement of reflectance in this range allows the identification of different species of plants.

The absorption and reflectance of plants in the visible and infrared range depend on the chlorophyll content, the amount of water and surface morphology of the plant. These spectral properties are expressed in the form of vegetation proper index VNIR (visible and near infrared (Fig. 1). Spectral reflectance of vegetation increases very steeply as the

wavelength increases above 0.7 μm and 0.75 μm. This change in spectral reflectance is called feeding edge [1].

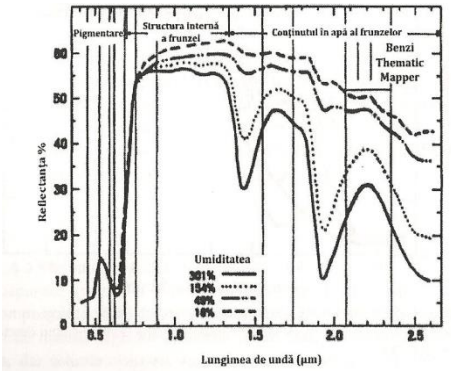

Fig. 1. Spectral reflectance curve by wave length

Landsat satellite images. Landsat 7 functions from the date of 15th April 1999. The Satellite's system of sensors and images' quality were improved. On this mission were kept the bands:1 to 4.5 and 7.

The ETM (Enhaced Thamatic Mapper) included a new panchromatic band with a greater width, containing a part of the visible spectrum (especially green and red) and near-infrared part of. Its spatial resolution is 14.25 inches (15cm). Thermal infrared 6 band was improved by doubling the spatial resolution from 58.5 cm to 60 cm.

All of these eight images are converted into 8-bit system, this allows a number of digital processing operations.

The system also includes the "dual-mode solar calibration" in line with internal calibration lamp. This led to a radiometric calibration accurate to 5%.

Satellite sources are qualitative. By making a combination of Panharped type using the panchromatic and a combination of three bands. These have as results natural colours or false colours images with a resolution of 15 cm [3]

The geographic interpretation of Landsat satellite sources.I have chosen Mostistea Valley micro- region.

Mostiştea Valley micro- region is located in the north- western region of the Calarasi district, near by Ilfov district.

The geographic coordinates of the area are given by Tămădăul Mare village which is the northern part of the micro- region, located on the 26 ° 57 'west longitude meridian and the 44° 47' parallel and the southernmost part determined by Frăsinet village coordinates, located on the 26 ° 44 'west longitude meridian and the 44 ° 15' north latitude parallel.

The micro- region is about halfway between Bucharest and Calarasi

The facts were obtained from USGS for year 1991 and 2011

The interpretation involves the analysis of spectral bands individually and compared to Mostiştea micro - region.

The purpose is related to the choice of the relevant tape and combination bands in the overall analysis of the landscape or the level of components such as plants, water, settlements and land use.

The combination of 1-2-3 bands includes the following bands (blue, green, red) (Fig 2 and Fig 3).

Therefore, it results a combination called also in natural colours. Band 1 (blue) allows highlighting vegetation. Band 2, in this band is the best chlorophyll spectral response from vegetation. Band 3 of the visible spectrum is red.

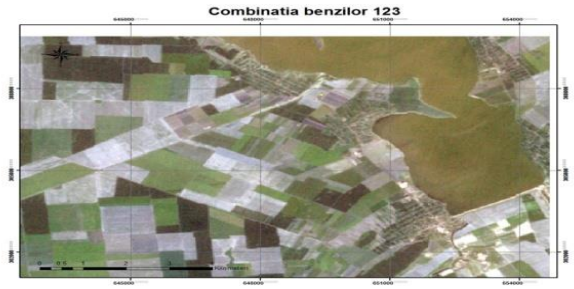

Fig. 2. Combination of bands 123 in year 1991

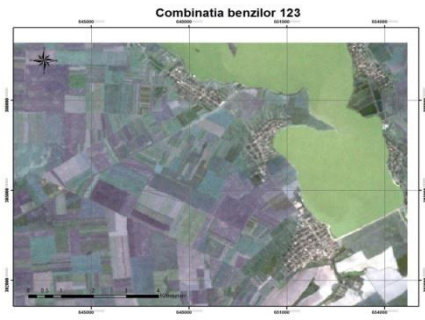

Fig. 3. Combination of bands 123 in year 2011

The combination of 2-3-4 bands. This combination involves the placing nearby infrared. The nearby infrared vegetation

response can provide information about the status of vegetation.
The image's analysis provides information on:
- the separation of green fields land without vegetation (Fig. 4 and Fig 5)
There is seen clearly delimited the lake area as an effect of the nearby infrared band in which the radiation is absorbed by water to surface.

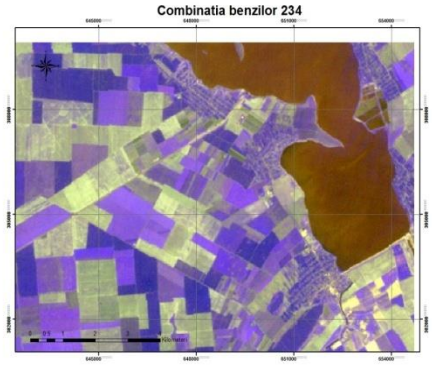

Fig. 4. Combination of bands 234 in year 1991

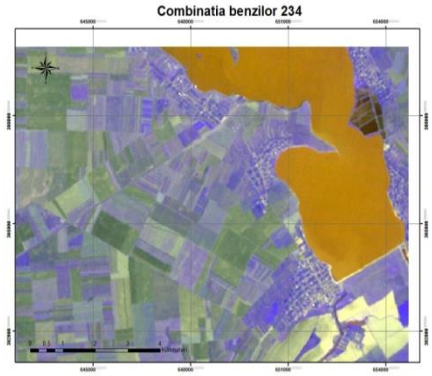

Fig. 5. Combination of bands 234 in year 2011

The combination of 4-5-3 bands. In this combination we have two infrared bands, and in this combination the spectral signature of vegetation is strong.
The combination of the signal is the best for identifying the vegetation (Fig 6 and Fig 7).

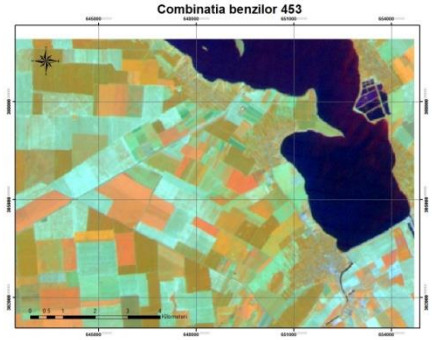

Fig. 6. Combination of bands 453 in year 2011

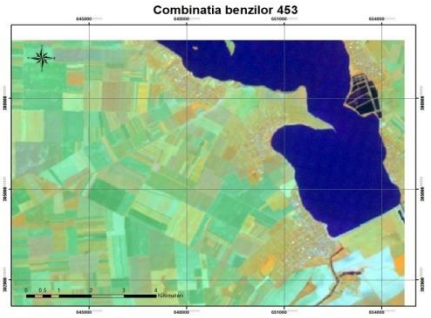

Fig. 7. Combination of bands 453 in year 2011

RESULTS AND DISCUSSIONS

Histogram The expression of the image's contrast results from the distribution percentage method of the spectral value or the numbers assigned to the pixels, which form the spectral satellite image for each spectral band separately. The graphic is represented by a rectangular axes system, which characterizes each spectral band image level. Histogram analysis shows a maximum concentration of dark pixels in the image. An image has a unique histogram but the reverse is not true in general since a histogram contains only radiometric and no spatial information. A point of some importance is that the histogram can be viewed as a discrete probability distribution since the relative height of a particular bar, normalised by the total number of pixels in the image segment, and indicates the chance of finding a pixel with that particular brightness value somewhere in the image [2].

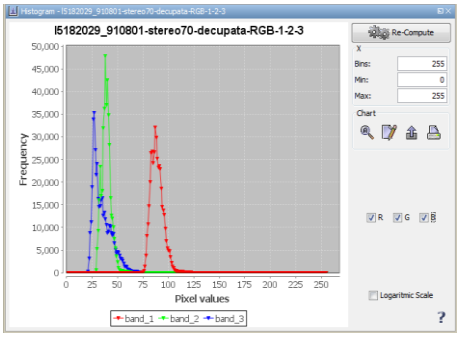

Fig. 8. Histogram RGB 123

Also for comparison the Mostistea surface we used and satellite remote sensing imagery provided by SPOT in 2007 (Fig.9).
The current plans for SPOT – 5 envision the replacement of the SPOT – 4 HRVIR systems

with high resolution (HRG) instruments. These system are designed to provide higher spatial resolution (5m, instead of 10m) in panchromatic mode; 10m (instead of 20m) resolution in the green, red, and near – IR bands; with 20 m resolution maintained in the mid – IR band due to limitations imposed by the geometry of CCD sensors used in this band. The panchromatic band used will return to the spectral range employed in SPOT – 1, 2 and 3 (0.51 – 0.73 μm). Also envisioned is the provision of resolution panchromatic data by combining two 5-m resolution images shifted along track and sampled every 2.5 m.

It is also envisioned that SPOT – 5 will incorporate envisioned that SOPT – 5 will incorporate a high resolution stereoscopic (HRS) instrument. The HRS instrument will incorporate fore and aft stereo data collection and facilitate the preparation of digital evaluation models (DEMs) at a resolution of 10 m on a global

The use of SPOT HRV and HRVIR data for various interpretative purposes is facilitated by systems combination of multispectral sensing with moderate spatial resolution, high geometric fidelity and the provision for multidate and stereo imaging.

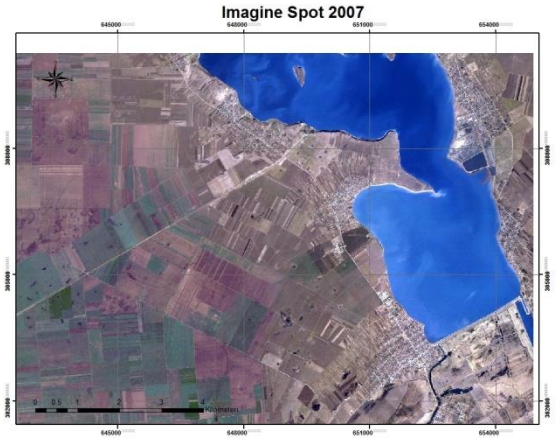

Fig. 9. Spot images in 2007 Mostistea area

CONCLUSIONS

Within this framework were three combinations of spectral bands analyzed for studying vegetation. The optimal combination was made so that the spectral behaviour of the studied area. The bands choice must be made depending of the soil type, climate and vegetation.

In combination 1-2-3 is observed that the separation of vegetation is very poor.

In combination 2-3-4 is the infrared band and we can separate green fields depending on the type of vegetation which covering the land.

Combination 4-5-7 shows the best combination of existing differences in the studied crops in area Mostistea

To study terrestrial phenomena are chosen images under favourable weather conditions without clouds. The visual interception for assessing crops status is more difficult than intercepting the visual image of the crops type. It is also difficult to identify the different effects produced by disease, insects' attacks, and nutrient deficiency because of the variety of plants, plant maturity, the rate of planting soil or various colors. Some problems of interpretation may arise after dry periods, so interpretation must be done on images that are acquired in a short time after rain

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AGROTOURISM – CHANCE FOR ECONOMIC DEVELOPMENT OF ROMANIA

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Abstract

Agrotourism represents the most important way for developing the rural area, generating income and creating jobs. The aim of the paper is to analyze the economic importance of tourism and agro-tourism, between the periods 2001 – 2011, for the top 10 leading countries by tourism receipts, according to Data World Bank: USA, China, Germany, France, England, Italy, Spain, Australia, Turkey and Austria, plus the main countries witch Romania is in competition, Hungary and Bulgaria, by the contribution of tourism and agro-tourism sector in accomplishment of GDP, by average made on the analyzed period and by annual growth rate, analyze that place Romania on the position 150 of 176 countries surveyed with an annual growth rate of 1.52% from GDP.

Key words: *agrotourism, annual growth rate, tourism, GDP*

INTRODUCTION

Worldwide, all rural areas face problems of population decline and profound economic changes, over a century of industrialization and urbanization trends have changed a strong economic position of rural society but in the last 50 years, we are witnessing an intensification of these trends.

The evolution of international tourism is characterized by increasing trend, influenced by a number of socio-economic, demographic and policy.

Tourism receipts grew more pronounced than that of arrivals growth is due in the first inflationary phenomenon, characterized also a number of other factors such as increased length of stay, spending on tourism activity, also increased the length of travel. From 1950 to the present, international tourism receipts have risen significantly. During 1950 - 1990, revenue increased over 600-fold, from $ 2.1 billion in 1950, representing the 80's U.S. $ 277 billion and in 1990 the amount increased revenues reaching 435 billion US dollars.

Currently, despite the economic constraints that we faced in 2012, tourism revenues increased to as much as arrivals. Also, in the world of international tourism 2011receipts increased compared with 2010, reaching an estimated worldwide U.S. $ 1.256 billion or 987 billion according to data provided by the World Bank.

Travel through the economic activity it produces is considered one of the most dynamic and future development areas.

Revenues from exports of services, investment and their multiplier effect, create new jobs and so on, are considered direct and indirect economic impacts caused by tourism activity. Viewed in relation to the national economy, tourism acts as a stimulating element of global economic and social system. Conducting tourism requires a specific request for goods and services, leading to greater demand within their production. Under these conditions, the main arguments that determine the need to develop tourism, resulting in the following:

-tourism is practically inexhaustible resources, tourism is one of the economic sectors with real prospects for long-term development;

-comprehensive exploitation and utilization of tourism resources accompanied by effective promotion on foreign markets can be a source of increasing foreign exchange earnings, contributing to a favorable balance of payments;

-tourism is a reliable labor market and the

redistribution of the unemployed from other sectors heavily restructured;
-tourism, through its multiplier effect acts as an activator element of the system global economy, generating an application specific goods and services that involve a their growth in production, thus contributing to diversification of the sectors of the national economy;
-harmonious development of agrotourism on the whole territory of economic growth and social and reducing the gaps between different areas, representing a source important to increase household income.
-agrotourism is a means of developing rural areas by expanding supply specific and job creation in rural areas other than traditional improving living conditions and increasing the income of the local population;
-diversification of local industry by supporting the establishment of SME's; agrotourism - related development of clean industries and consumer goods (handicrafts, furniture, leather).
-while respecting and promoting the principles of sustainable development, agrotourism is a means of protection, conservation and recovery of the potential cultural, historical and architectural heritage of country folk;
-by adopting a strategy for sustainable agrotourism development and enforcement of environmental protection measures, the fundamental values of human existence (water, air, flora, fauna, ecosystems, etc..), while tourism has an ecological vocation;
-occurs in social tourism as a means of educating and actively raising training and civilization of the people, having an important role in people's leisure use.
- promotion of exports, subject to capacity building of the Romanian industry to export to international markets.
Tourism is now the main accelerator of development of global processes of economic, social and cultural and, according to the World Tourism Organization, tourism ranks first in world trade and in providing export earnings.

MATERIALS AND METHODS

Looking on worldwide tourism and agro-tourism, for the case of the top 10 countries by tourism receipts: USA, China, Germany, France, England, Italy, Spain, Australia, Turkey and Austria, plus the main countries witch Romania is in competition, Hungary and Bulgaria, we have analyze for the period of eleven years, 2001- 2011, the contribution of tourism and agro-tourism sector in accomplishment of GDP, by average made on the analyzed period (x) = * (x) / N, where x n is the number of productions years and years and by fixed base index method, based chained, the annual growth rate and trend equations,
Annual growth rate =

$$r2001-2011=\sqrt[11]{\prod(p1/p0)-1}'$$

Where: r2001-2011 = average annual growth rate; Πp1/p o = growth indicators linked.

RESULTS AND DISCUSSIONS

According to the Data World Bank, worldwide, the average recorded in tourism receipts are 1.80% of global GDP, annual growth for the period 2001-2011 is positive but very low, only 0.24%. The ASEM contribution to GDP that tourism has differed between states, depending on the level of development and also, the economic structure of the countries.
The main countries analyzed are the top 10 countries that have experienced the highest grossing tour in the 2001-2011 periods to which we added Hungary and Bulgaria, considered as the main countries with which we are in competition, and Romania.
In most countries around the world, agro-tourism is in an uptrend. Start the analysis is given by the United States, the country which is on the first position on the receipts from tourism receipts instead contribution to achieving the GDP is only 1.06% below the average global positioning itself in the overall standings at 151 out of a total of 176 participants in the study with an annual growth rate of 1.52%. Follow China which

ranks 145 with a contribution to GDP of 1.17% and the lowest growth rate, a negative of -6.55%. Germany on 134, with 1.42%, France at position 102 with a contribution to GDP of 2.48%'s England ranks 119 with 1.75% of GDP, being closer to the world average, registering a growth rate positive. Italy ranks 111 with a contribution to the GDP than the world average being 2.15% annual rate in return is negative, -1.46%. Spain, with a significant contribution achievement of GDP, 4.70%, ranks 63, the annual growth rate is -1.93% exchanges.

Australia ranks 90 with a contribution of 3.04% and a negative rate of -3.05%. Turkey contributes to the achievement of 3.99% of GDP, well above the world average in parts; the growth is -3.44, standing in position 72. Receipts from tourism in Austria, have a good contribution to the achievement of the GDP by 5.79% but with a negative growth rate (-1.11.). Being in position 150, revenue from tourism in Romania's case is only 1.08% below the world average but with a positive growth rate of 0.52%. Hungary ranks 55 with a contribution of 5.02% but with a negative growth rate of -4.63% as large. Past 11 years seem to have been a good omen that Bulgaria ranks 29 with a contribution of 9.49% and an annual growth rate of -0.67%.

Table 1. Evolution of GDP contribution of tourism income averaged over the period 2001-2011

Place in the world	Country	Years						Average		Average annual growth
		2001	2007	2008	2009	2010	2011			
	UM	%	%	%	%	%	%	%	%	%
	World	1.75	1.87	1.88	1.78	1.77	1.79	1.80	100	0.24
151	USA	1.07	1.06	1.20	1.08	1.15	1.24	1.06	59	1.52
145	China	1.43	1.18	0.98	0.85	0.85	0.73	1.17	65	-6.55
134	Germany	1.29	1.48	1.47	1.44	1.50	1.48	1.42	79	1.44
102	France	2.87	2.47	2.39	2.25	2.21	2.35	2.48	138	-1.97
119	England	1.78	1.71	1.75	1.77	1.81	1.88	1.75	97	0.54
111	Italy	2.40	2.17	2.11	1.99	1.96	2.07	2.15	120	-1.46
63	Spain	5.56	4.51	4.42	4.10	4.28	4.57	4.70	261	-1.93
90	Australia	3.38	3.01	2.69	3.04	2.84	2.48	3.04	169	-3.05
72	Turkey	5.14	3.20	3.43	4.00	3.39	3.62	3.99	222	-3.44
48	Austria	6.01	5.62	5.88	5.53	5.55	5.37	5.79	322	-1.11
150	Romania	1.04	1.22	1.28	1.03	0.99	1.10	1.08	60	0.52
55	Hungary	7.95	4.14	4.61	5.32	4.93	4.95	5.02	279	-4.63
29	Bulgaria	9.10	9.93	9.36	8.80	8.45	8.51	9.49	528	-0.67

After we had presented the situation in the Table 1.1., we can divide the 13 countries into two categories: I - those recorded during 2001-2011 a positive annual growth rate which includes USA, Germany, England and Romania and second, the countries that have experienced a rate negative annual growth: China, France, Italy, Spain, Australia, Turkey, Austria, Hungary and Bulgaria (Table 1).

CONCLUSIONS

For Romania, considered as a country with great agro-tourism potential of receipt, the conclusions drawn from the analysis of the evolution of tourism in the world have a special significance, serving the tourism industry development orientation, based on an appropriate investment policy and diversification continue and specialized

services to potential tourists. From evolution to date of international tourism is on the following specific aspects of application services:

- Continuous development trend upward, which after all prerequisites will be long-lasting, even in light of the growth rates are likely to be slower than those recorded in the last decade;
- Diversification continuous demand as a consequence of evolutionary preferences of tourists and change age categories, on the one hand and the transformation of tourism into a full-table, on the other hand;
- Is recorded considerable differences from one country to another and from one geographic area to another pace of tourism development. Regarding the share of different geographical regions in international tourist traffic, there is a high concentration in terms of both receiving countries, and especially of the sending countries, Europe is in first place;
- The fastest pace of growth in tourist arrivals were recorded, since 1960, the countries of Europe, including Romania.

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OLT COUNTY'S RURAL DEVELOPMENT THROUGH AGROTOURISM

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Abstract

Sustainable development and success of rural tourism and agrotourism not depends only by attractive tourist facilities and landscape, depends to an extent more or less equal competitive and quality service. Tourism, being known as one of the world's most competitive activities require commitment, professionalism, understanding, organization and not least an effective strategy for human resource development. The materials we will present the method used in the study was a questionable applied in Olt county, in the 9th joint distributed three forms of relief: Meadow: Gura Padinii, Gârcov and Orlea, Plain: Călui, Curtişoara, Pleşoiu and hill Leleasca, Oboga and Sâmbureşti, in order to analyze and agro tourism potential, to develop strategy and promote recovery. In evaluating the survey data used to test the association, (Chi, Hi or $\chi 2$ theoretically) test allows highlighting the existence / non-existence of a link between the association created under local segmentation variables studied.

Key words: *agrotourism, commune, hill, meadow, Olt county, plain*

INTRODUCTION

Located on the lower course of the river Olt, river which have gave the name of the county and having the privilege to be riparian with Danube, Olt County, with an area of 5498 square kilometers, representing 2.3% of the country territory, number 22 between counties and a population of 489,274 inhabitants, according to the 2002 census it ranks 18 on the county with a density in 2011 of 84,2 inhabitants per square kilometer, is one of the oldest Romanian counties, as attested to April 25, 1500.

Olt County is part of South-West Oltenia development region, based in Craiova, along with four other counties: Dolj, Gorj, Vâlcea and Mehedinti.

In this current form, is a happy combination of two old historic provinces: Muntenia, by keeping a large part of its old territory and Oltenia, by adding territory right Olt county belonged to the former abolished, Romanati, county names resonance in a historic document since august 1, 1496. The fact that more than 50 localities are attested before 1500, eg. Celei, mentioned documentary from 1247 in *Diploma Cavalerilor Ioaniti* and Slatina on January 20, 1368, when Vladislav I. Vlaicu granted exemption from customs for merchants of Brașov County, we shoe that these territories preserves the traces and remains of great historical significance, have been an active participant in our county millennial history of this nation.

In terms of relief, we find two predominant forms: hills and plains centered on North-South axis of the county, running through the northern like an amphitheater, occupying about a third of surface and plains, continuing his gentle flow of the Danube great in two thirds.

According to the relief form, we conclude that Olt is a predominantly agricultural county, as most county of the South, whose cultures are comforted a longer period of time, with benefits of rays of the sun.

Another important aspect when we talk about Olt county is the hydrographic network, network which is cut in two by Olt river, from North to South county, formely delimiting the two counties, today united, Olt and Romanați or Muntenia by Oltenia, havind a length of 143 square kilometers. In the South, the county enjoys the blessings of the Danube over a distance of 54 square kilometers.

Other smaller rivers flow flowing into the Olt river, with their credit, are: Oltet, Teslui, Dârjovul, Beica and in North Vedea with his affluent Plapcea.

All these coordinates, if only a brief description, sketch a portrait of physical and historical-geographical potential of a county agricultural economic and socio-cultural, where rural areas remains, in may places, traditions, customs and craft occupations and, urban areas, preserving the vestiges of the past, is connected with modern styles and adopting new technologies in construction.

Althought there is a real potential for tourism, unfortunately, is not a well-defined phenomenon of reference in Olt County. In fact, in a classification level, in terms of tourism, Olt ranks 38 in top counties.

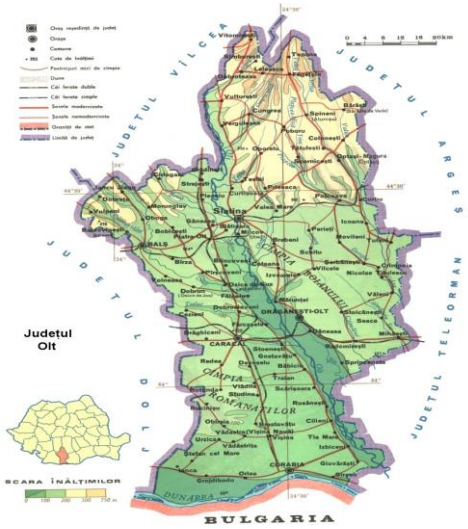

Fig. 1. Olt county map

What would be the reasons, it is hard to say, especially today when we came and still are tell many a crisis. The only form of tourism practiced in Olt county are organized trips to various holidays, Easter, Christmas or New Year by the few travel companies in the country or abroad, but, nobody involved in creating programs to promote tourism through various forms of practice and bringing tourist to the county, although here in Olt, are at least two centers of traditional crafts widely recognized Oboga, with pottery an Vădastra, making the coats (Fig.1).

MATERIALS AND METHODS

Forward, we will present the method used in the study was a questionable applied in Olt county, in 9 commune, distributed by three forms of relief, in order to analyze the agro touristic potential, to develop strategy and promote recovery:

-Meadow: Gura Padinii, Gârcov, Orlea;
-Plain: Călui, Curtișoara, Pleșoiu
-Hill: Leleasca, Oboga and Sâmburești

In evaluating the survey data we used the association test (Chi, Hi or $\chi 2$ theoretically). This statistical indicator involves verifying the hypothesis of association between responses from questionnaire alternatives, of questions and checking a particular set of data that can follow a known statistical distribution. The test applies to socio-economic issues and is calculated composition of contingency table; the data is classified by one, two, or more variables of segmentation. This test allows highlighting the existence / non-existence of a link between under local association created segmentation variables studied.

RESULTS AND DISCUSSIONS

Sustainable development and success of rural tourism and tourism depends not only attractive tourist facilities and landscape, depends to an extent more or less equal competitive and quality service. Tourism, being known as one of the world's most competitive activities requires commitment, professionalism, understanding, organization and not least an effective strategy for human resource development.

Regarding the ranking of respondents on the reasons why the community as possible tourist place, the classification is as follows: for the relief hill, entertainment and recreation opportunities, the main reason, ranking first in the preferences respondents followed in second place by sights present in this area. Last choice among respondents is the beauty of the area and affordability do not play a decisive role in the choice of destination.

Plain, the situation takes a different form, respondents focus primarily on opportunities for fun, followed closely by affordability and traditions, both holding a draw. Beauty of the area and the people very hospitable is not the primary determinant of this area relief. Sights to the relief plain are the last choice, and the lowest score recorded.

In the meadow, traditions play a very important role in the choice of destination, ranking the first position followed by chance of fun. Last place among respondents beauty of the area is occupied by meadow.

The final classification for all areas of relief is as follows: possibilities for fun ranks in first place, second place is popular traditions, sights and people share the same position, being tied, and the last two positions are represented by the beauty of the area and hosts.

Thus, following the implementation of the questionnaire respondents among participants, we issue the following statement: within the new community, the main reason the common choice as a potential tourist spot could be for entertainment and recreation (Table 1).

Table 1. Hierarchy Respondents ranking assessments of why the choice of the community as possible tourist spots, in Olt County, 2012

Landforms	Commune	Reasons for choosing village					
		Tourism objectives	Beauty of the area	Traditions	Convenient price	Hospitable people	Opportunities for fun
		Hierarchy of importance (1 to 6)					
Meadow	Gîrcov	5	1	6	2	3	4
	Orlea	1	2	3	4	5	6
	Gura Padinii	5	3	6	4	1	2
	Average meadow	*3.67*	*2.00*	*5.00*	*3.33*	*3.00*	*4.00*
Plain	Pleșoiu	3	4	6	2	1	5
	Curtișoara	1	2	3	5	4	6
	Călui	1	2	4	6	3	5
	Average plain	*1.67*	*2.67*	*4.33*	*4.33*	*2.67*	*5.33*
Hill	Leleasca	4	1	6	2	3	5
	Sâmburești	5	1	4	2	3	6
	Oboga	5	2	1	4	3	6
	Average hill	*4.67*	*1.33*	*3.67*	*2.67*	*3.00*	*5.67*
Average zone of relief		*3.34*	*2.00*	*4.33*	*3.44*	*2.89*	*5.00*

Source: Smedescu Dragos,2012, Touristic and Agrotouristic W=Questionnaire applied in the Olt County communes

Analyzing potential of Olt County agro tourism in the new community studied, farm structures as relief areas and the number of household members is as follows: stands entirely without drinking water collective network landform meadow.

For the other two forms of relief, plain and hill among 43.5% of respondents are connected to piped water supply collective.

Another big absence of utilities for meadow and hill landforms is the gas pipe and if the plain landform at just 19.4% of respondents is connected to the gas network, the situation in the nine common being much lower, only 6.5% of respondents are connected to the gas grid, finishing in last place.

All of the new joint notice it reached a maximum cable TV line holders, the percentage is 100%.

Analyzing the situation in terms of Internet access, the situation is as follows: for the relief meadow, 77.78% among respondents have Internet access, the plain 52.8%, and for hill 72.2%. Average for the three areas of relief is 67.6%, ranking the third position after Cable TV (100%) and drinking water from its own resources (74.1%).

If we look at the importance of a fair price in choosing a Farmhouses by the relief which is found placed observe that 78.70% of respondents consider it very important. By testing the association chi-square statistic = 11.57, critical value = 10.64 Critical probability <0.01, the respondents view the importance of a fair price in choosing a Farmhouses by the relief where it is found set, it shows an association between the respondents and the opinion which found relief guesthouse situated on the problem analyzed. In this situation we can draw the following conclusion: the choice of guesthouse depending on the area of relief is influenced by a fair price, with a probability of between 90-95% (Table 2).

Tabel 2. How respondents appreciated the choice depending on the agro pension of relief and a fair price

Relief	UM	Fiar price				Total	
		Very much	much	less	Not al all	no	%
Meadow	No	31	5			36	*33.3*
Plain	No	32	4			36	*33.3*
Hill	No	22	12	1	1	36	*33.3*
Total	No	85	21	1	1	108	*100.0*
	%	*78.70*	*19.44*	*0.93*	*0.93*	100	X
Indicators	Test $\chi 2$	Level of significance					
	≤	0.2	0.1	0.05	0.01	0.001	
CHITEST (value Sig)	0.07228494						
Degrees of freedom	6						
CHIINV (Chi teoretic)	≥	8.56	10.64	12.59	16.81	22.46	
CHIINV (Chi calculating)	11.57						

Source: Smedescu Dragos, 2012, Touristic and Agrotouristic W=Questionnaire applied in the Olt County communes

The situation on the structure of respondents by area of relief and consider how traditional products serving customers in question are traditional menus with which you greet tourists answers were as follows: for the relief meadow, 36.11% felt that they can crease demand by tourists desires while 63.89% believe they can persuade tourists with traditional menus made within the household, managed by traditional recipes, full of flavor to win customers. In the lowland relief, 25% think that would be served and 75% go on traditional diets, made mostly with household products. In the area of relief deal also emphasize traditional menu, conducted largely owned household products.

The average of the three forms of relief is as follows: only 24.07% of respondents are willing to serve guests with what they want while the vast majority of the respondents, 75.93% consider that a traditional menu with natural products is more important.

The statistical test of association, chi-square = 6.18, critical value = 5.99, it is estimated that between relief areas and how they will be served traditional drop a link with a probability of over 95% (significant) and those from the meadow view that will serve them what they want and traditional products, while those in the plains and hills that have served mainly considers household products (Table 3).

Table 3. Structure of respondents according to the relief and serving customers with traditional products (menus)

Relief	UM	What are the traditional menus with which you greet tourists?		Total	
		I served what it wants	products majority of household	nr	%
Meadow	No	13	23	36	33.33
Plain	No	9	27	36	33.33
Hill	No	4	32	36	33.33
Total	No	26	82	108	100.00
	%	24.07	75.93	100.00	x
Indicators	Test $\chi 2$	Level of significance			
	≤	0.05	0.01	0.001	
CHITEST (value Sig)	4.55E-02	*			
Degrees of freedom	2				
CHIINV (Chi teoretic)	≥	5.99	9.21	13.82	
CHIINV (Chi calculating)	6.18				

Source: Smedescu Dragos, 2012, Touristic and Agrotouristic Questionnaire, individually applied in the Olt County communes

CONCLUSIONS

Olt county spent as part of South-West Oltenia Development Region remains, although it has a great tourism potential, a county where tourism is not found. Due to huge agricultural potential, the infrastructure in a state somewhat acceptable and rural environment diversified activities, tourism remains a possible basin for the county. Need more
bending, education and training, investment and greater understanding of the policy makers and the rural population, patience.

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THE ATTITUDE AND MOTIVATION OF BUYERS OF TRADITIONAL/ LOCAL/BIO PRODUCTS IN THE CONTEXT OF AGROTOURISM, IN SIBIU COUNTY, ROMANIA

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Abstract

Based on the statistical data concerning the sheep breeding in district Sibiu and on the information obtained by making investigations markets and fairs where they sell traditional/bio products, the extent was appreciated to which this products are known and desired. The survey was conducted between May and November 2012 in four locations: "Transilvania Peasant Market (Piata Taraneasca Transilvania)", "Traditional agro-food products Fear (Targul de Produse Agroalimentare Traditionale)" from Huet Market, "Traditional Products and Handicrafts Fear (Targul de Produse Traditionale si Mestesugaresti)" inside the Carrefour hypermarket and in "Agricultural Market" Rasinari, Sibiu county. There were also comments mentioned on the topics on the occasion of Peony Festival (Festivalul Bujorului) from Gura Raului (July 2012), "Cheese and Plum Brandy Festival (Festivalul Branzei si al Tuicii" from Rasinari Commune (August 2012), "Countryside Fear (Targul de Tara)" from the Museum of Popular Civilization Astra Sibiu (August and September 2012). The research instrument used was the questionnaire. The items of the questionnaire aimed to identify issues such as motivation of buying traditional/local/bio products, frequency of supply with traditional/bio products, the link established with manufacturers, knowing locations where you can buy traditional/bio products. Research methods were documenting appropriate, design and develop of a questionnaire, 25 buyers of traditional/bio products were asked. The questionnaires were applied by a single interviewer.

Key words**:** *bio, markets, mountain, recovery, sheep*

INTRODUCTION

The quality food products for consumers, nice landscape for tourists, rich biodiversity for those who want to preserve nature, innovative business opportunities for farmers, all these represent high nature value farming. These agricultural systems are very important because they promote the care for natural resources, which in many countries of the European Union have been neglected and lost. Also, they help to inform about the crucial role that the farmer has in the maintenance of the natural and cultural treasury by the traditional method that he uses to work his land, by the traditional way that he has for the preparation of food and he continues to make superior quality products by multiplying and sharing with the following generations the traditions and customs related to the nature, this way of living leading to the preservation of rural landscapes and the protection of natural resources.

There are differences between the concept of traditional product and the concept of local product.

Traditional product is the product which must be made from traditional raw material, to present a traditional composition or a mode of production and/or processing reflecting a technological process of production and/or traditional manufacturing and clearly distinguishes products of the same category. [1] In our country there are regulations on the certification of traditional products. The certification of traditional products [2, 3] represents the recognition of tradition of a product by registration in special register, in accordance with the rules on the conditions and criteria for the certification of traditional products. All this products can be considered a source of food for tourists. [10]

The local product - the specific terminology entitles them important products for the preservation of nature, or High Nature Value Products. These are the products that help to maintain the natural landscapes in the rural areas, by the continuous agricultural practices of farmers for the growth of animals, and the works of the land. The local products also represent an important principle of the development of local economy. [5]

In an attempt of defining them we can say that they are food products, services obtained and consumed at the local area. Food products and agricultural practices by which the land pastures, orchards are dealt with, but also the way in which animals are being used and kept, play an important role in the maintenance of local culture, of the landscape, but especially for human health and that of the children. Thus the obtainment and sale of local food products represents an important factor for the maintenance and development of the community, and in the main time a source of sustainable benefits for local economy.

A local important product for the preservation of the nature is that, that helps to the preservation of biodiversity of the rural space –species of plants and animals that depend on this kind of environment- the preservation of habitats and rural landscapes, as well as the protection of natural resources- by the usage of friendly environment practices; the development of local economy, supporting farmers from semi-sustenance, by maintaining the agricultural activities in farm systems.

The local products important for the preservation of the nature must:

-support the local economy- by the proper valuation of the local products, the obtained incomes must return to the farmers and this way the help to support his future activity and the maintenance of farm systems

-preserve and maintain the local cultural treasury and help to the maintenance of the cultural identity of rural areas, by promoting local traditions and customs, local celebrations where customs, habits and way of dressing are being promoted, but also the practice of grazing, a traditional job transmitted form generation to generation.

-contribute to the preservation of rural landscapes, by the preservation of biodiversity –species of plants and animals, habitats and natural resources, due to a reduced involvement of human interventions;

-help to maintain the agricultural traditional practices

-extensive agriculture, the main type of using the lands and fields

-the use of organic raw, according to the fertilization requests

-the reduced density of animals, having in consideration the natural capacity of production of the pastures; (grazing can be made with max 1 UVM /hectare);

-reduced human intervention

-reduced existence of technology, the use of manual practices

The type of products that can be considered local and of having high local value are: milk, diary, cheese, meat products: stock, sheep, sausages, smoke dried salt meat, marmalade, jam and tinned fruits, honey and products of honey; products from forest fruits and medicinal herbs, wine and natural juices, plum brandy

The agrotourism is compatible with green economy. That compatibility is sustained by the idea of green tourism, i.e. of tourism practiced in relation with Nature. Green tourism represents one of the three branches of tourism industry [7], together with travel industry and hospitability industry. The green colour has been chosen especially because it is in synchrony with the rural zone and with the Nature. The green tourism is defined as a touristic activity practiced in the agro-rural space from the province zones, but also in low populated zones, as well as in certain mountain zones which do not have a special destination. [8]

Regarding the attitude and behavior of buyers, there are studies showing that standard food offered at affordable prices, usually satisfy psychological needs and find a large number of consumers. High quality food play in addition to these the role of representing the social class and groups with high income, and

even projecting an image of them. Thus, according to these studies, in the opinion of consumers, on the first place are food products to use – 40%, hygienic food products – 30%, organoleptic food products – 20%, and nutritional and dietary products have a share of 10%.[9]

RESULTS AND DISCUSSIONS

Data concerning the sheep breeding in district Sibiu

Sheep breeding in district Sibiu is a many centuries, traditional activity. It is the main activity in area Marginimea Sibiului where farming is practiced alongside with traditional activity on the processing of specific products with a strong local character. Sibiu, with approx. 459,000 sheep and 1,732 farms takes the second place in the country in terms of growth of this species. The average dimension of a sheep farm in Sibiu is 265 heads. In the district there are 181 farms (10,5%) holding more than 500 individuals, four farms holding more than 2000 sheep/farm, breeding together 2,51% (11,548 individuals) and a farm that breeds more than 4000 sheep. [5]

Analysis of data from the questionnaire concerning the capitalization of traditional products

The 25 asked buyers were part of the following age categories: 20-30 years – 52%, 31-50 years – 24% and over 50 years – 24%.

Following this study revealed that the most popular categories of traditional/bio products are diary, meats and bakery products. Other categories of products known by the buyers as traditional/bio are bee products, fruit, apples and underbrush. At the same time buyers are well aware of sweets, jams, fruit juices, herbal teas, vegetables, vegetable stew, cold pressed oils, syrups, pickles, eggs, wine and brandy.

The most wanted products are dairy products both from sheep and cows, meats, followed by bee products and bakery products. They are also willing to buy fruits, vegetables herbal teas and fruit juices. The less wanted products are jams, sweets, pickles, eggs, vegetable stews, syrups, wine and brandy.

Concerning the site where supply these products, 26% buy only from local markets, 20% buy from markets and special stores, 20% buy direct from producers. Another category of buyers (18%) make their supply from the market and from the producers at home and 16% have three sources of supply: from markets, special stores and direct from the producers (Fig.1).

When asked why they buy this traditional products, 20% answered they consider them healthy, 12% for their quality, 3% for they are fresh, 3% trust the producer, 5% buy the products for they are fresh and have a good quality, 8% for they are healthy and have a good quality. However 9% chose them because they are healthy, they have a good quality and trust the producers, 12% buy traditional and bio products because they are fresh, healthy, they have a good quality and they trust the producers, 3% because they are tasty and another 3% buy this products because they are something new for them.

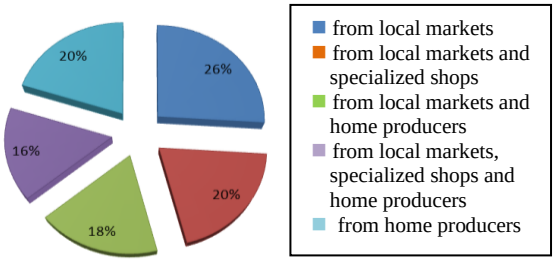

Fig. 1. The place from where traditional products are buyed

Regarding the choice to buy from the same producer, 35% always buy from the same producer, 30% said they most often prefer to buy from the same producer and 35% said they do not buy exclusively from the same producer.

To see the extent of establish a link between producer and buyer, we wanted to know if the buyers ask questions about how to make this products. From this point of view, is was observed that 35% of the asked traditional/bio product buyers use to always ask questions about how to make the products they buy, 27% of the asked buyers use to ask the producer questions regarding the products but

not every time they buy and 38% of the responders do not usually inquire this (Fig. 2).

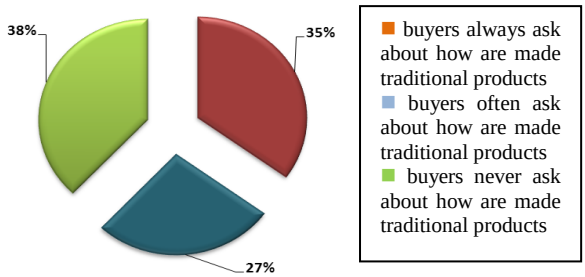

Fig. 2. The extent in which buyers are interested in the way in which traditional products are made

Regarding the price of the products 35% said that they are willing to pay more for a traditional/bio product, 47% would be willing to pay more for most of this products and 18% said they are not willing to pay a bigger price for this products.

The frequency with which this products are bought is different: 44% of the responders buy the products once a week, 20% buy twice month, 11% once a month, 220% buy occasionally and 5% more than once a week (Fig. 3).

Most buyers interested in this products (56%) know the special stores in city Sibiu, most popular are: Eco-Prod Traditional, The Traditional and Ecological Producers Association ”Marginimea Sibiului” and the stores which sell natural products in Sibiu.

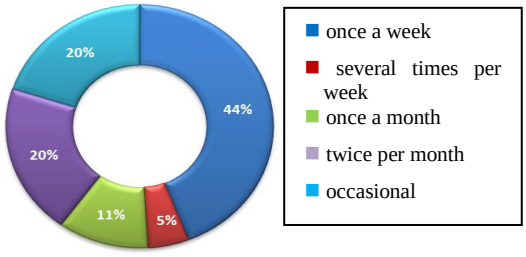

Fig. 3.The frequency of buying the traditional/bio products

CONCLUSIONS

The asked know well the products of the local producers but the bio products are less popular, as, moreover, the number of organic producers who sell the products in the four markets is very small, only 12%.

The most popular and the most purchased products are dairy products from both sheep and cattle, followed by meats and bakery products, and in the biological area honey, sea buckthorn and herbal teas.

Many buy from markets but most buyers visit the special stores and even buy from the producer at home. This encourages the producers on the one hand and on the other hand in this way may arise direct the relationship based on trust between producer and buyer, while preventing the emergence of intermediaries.

Most buyers want healthy, clean, traditional/ bio products with a high quality because this products represent for them a guarantee of quality food.

A large proportion 65% buy from the same producer, which again helps strengthen producer-buyer relationship, bringing a number of benefits to both parties.

While 35% are interested in the way in which the products they are going to buy are made, shows that a large proportion of buyers appreciate the authenticity of the product, the traditional recipes but also food safety, a rate approximately equal buyers 38% are not interested in how to make the products, which shows that this buyers are still not aware of the benefits off this products, relying more on the fact that the products are very tasty. There are also few who do not ask because they trust the producer.

A positive thing is that people are open to such products and they are willing to pay more and 80% of the buyers are regularly supplying with traditional/bio products. More than half of the asked people know the special stores in the city and nearly half of them had the opportunity to taste traditional/bio products in a hostel in the country.

The multitude of individual attitudes the buyers to claim the increase of the products quality. To remove the uncertainty ooh the buyers, intense communication is required, this after the high quality of the raw material.

Consumer motivation is a universe that cannot be observed directly. In the Register of traditional producers from Sibiu county are registered 191 products. On the list of

traditional producers of sheep meat products are registered 21 people and on the register for people who sell products obtained from sheep milk 35 people. Traditional agricultural practices do not endanger the species of plants and animal living in the rural area and do not affect their living environment.

Moreover, traditional products support the local economy: by selling the products the capital returns to the farmers and this supports the future of their business. For many farmers, this activities are the main source of income, without which they could not continue the work, however much they would like to keep traditions and stay close to the nature.

A traditional product maintain the cultural heritage of the rural area and helps preserve cultural identity by preserving local traditions and customs: local holidays and festivals in which the local costumes, customs and products are promoted.

Products obtained by traditional practices have a higher quality and are much healthier, especially for children. Milk, for example is better because during the summer sheep and cows graze freely on mountain pastures and during winter they are fed with natural fodder, hay and herbal concentrates.

For small producers who sell their products direct from their household must know the rules of Order 209/2007. Thus all small producers who sell small quantities of primary products of non-animal origin, cheese or prepared meat must register for direct sell to Veterinary County Department on the area the household is. [6]

All manufacturers and producers have the legal obligation to produce clean and safe food. For this producers should be made informative material on veterinary rules you need to follow, they should be registered as traditional producers and grant opportunities with which farmers and small producers can buy equipment and improve production standards, to meet the new conditions.

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INTEGRATED SYSTEMS IN PLANT PROTECTION MANAGEMENT: FIRE BLIGHT OF ROSACEOUS PLANTS (*Erwinia amylovora* (Burrill) - Winslow) IN AN APPLE ORCHARD IN SIBIU COUNTY

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Abstract

Integrated protection represents a modern approach, denoting a protection strategy of agro-ecosystems; and it represents a complex system employing all appropriate methods in a manner as consistent and smooth as possible, in order to maintain the biocenotic balance of agrosystems and to keep pathogens at a level at which they do not cause economic damage (so-called level of eco-efficiency). A biocenotic approach to issues of agrosystem protection against disease attack requires an acknowledgement of all aspects regarding the evolution of pests in time and space, so as to be able to intervene at the right time with all possible means. And such protection measures are not supposed to restrain existing tendencies in the agrosystem. Therefore, this implies the awareness that any applied protection measures do not affect solely a certain pathogen, but the entire plant and animal community, as well as the soil and water.

Key words**:** *economic damage threshold, plant protection management, quarantine disease*

INTRODUCTION

The main objective is represented by the development of an integrated protection system of apple tree crops against the fire blight of rosaceous plants.

One of the safest ways of achieving a sustainable agriculture is the introduction of an integrated plant protection (integrated management or integrated control), which is based on a combination of agro-phytotechnical, physical, mechanical, biological and chemical methods, with an emphasis on the non-chemical ones, and an application of control measures in the context of the given agrocoenosis only when justified economically and environmentally. For a correct application of plant protection measures and, in particular, for a decrease in the number of chemical interventions as a replacement of calendaristic treatments or according to plant phenology, one has to employ the knowledge regarding pest biology and ecology, as well as some economic and environmental criteria. Among the current methods in use, one has to emphasise – along those mentioned above – prognosis and warning; selection and improvement; interspecific relationship between zoophagous organisms and pests; and the economic damage threshold (PED). An integrated protection requires a continuous adaptation of the combat system to the environmental conditions of the area and the specific conditions of each plot, which are approximate and must thus be improved according to forecasts and warnings, as well as correlated with the absence or presence of biological products, selective pesticides, etc. It is obvious that by using the concept of thresholds, there are two environmental advantages, namely:

a. The use of a small amount of pesticides and, therefore, a reduction of pollution caused by them. b. A better preservation of environment, because thresholds only support a certain number of weeds, diseases and pests. Highly important in this case is the flora and fauna conservation, which is useful to the agricultural ecosystem. And in order to

decrease or even eliminate some of the negative effects of pesticides, the whole system should be analysed from several perspectives, thus enabling the development of an efficient and complete combat scheme. Plant diseases, by means of the damage they cause - 25-30% out of the total annual world production, maintain the scourge of hunger, which affects half of humankind. However, it is well known that through the integration of various control methods, a greater efficiency can be achieved in this respect [7]. These aspects are basically captured in folk wisdom; and there is a famous Romanian idiom according to which, it is man who blesses a place. Integrated protection refers to the harmonious combination of preventive and curative measures, as well as methods and their integration in plant culture technology, but only when justified economically and environmentally. In the field of integrated protection the economic damage threshold (PED) plays a crucial role because it represents the attack level at which treatments must be made. However, this is only valid when it comes to common pests, and not for the quarantine ones, such as the *Erwinia amylovora* bacterium, which causes a disease known as fire blight of rosaceous plants or as apple tree burn. Combat of plant diseases mainly comprises two major steps: prophylaxis (prevention, preventive measures) and theory (curative and therapeutic measures). However, one cannot always make a clear distinction between the two steps, since some measures have both a preventive and a therapeutic effect. The control is performed by means of several methods: genetic (by improving plant resistance to pests), agro-phytotechnical (by means of tillage and crop maintenance), physico-mechanical (thermal disinfection of seeds, vegetal surgery, seed decontamination, etc.), biological (by use of antagonistic organisms and natural products) and chemical (through the use of pesticides). A unilateral and excessive use of chemotherapy has given rise over time to negative effects for the entire environment [3]. Therefore, it is recommended that chemotherapy as part of integrated control is only used as an additional measure, to complete other actions, and only against those diseases that cannot be contained by any other means.

MATERIALS AND METHODS

The study was conducted in a private orchard with a surface of 344 hectares, planted with apple trees of several varieties: Jonathan, Florina, Golden, Strakrimson, Prima, Bistrita Golden, Generos, Gold Parmen, Patul. In 2012 several controls (inspections) were carried out, according to such phenological phases as „pre-blooming", „full bloom" and „post-blooming", so during the entire growing season, when symptoms were visible [10]. Attack symptoms occurred at the beginning of June. The evidence samples generated by the bacterium in 2012 were not sent for analysis to the Central Phytosanitary Laboratory Bucharest, since the symptoms were only present on those plots on which the disease had been confirmed by the Central Phytosanitary Laboratory in previous years.

RESULTS AND DISCUSSIONS

The entire area suspected of contamination is composed of the following constituents:
- 182 ha in the 1st locality
- 20 ha in the 2nd locality
- 45 ha in the 3rd locality
- 35 ha in the 4th locality

Total surface of apple orchard: 282 ha.

Table 1. Surfaces confirmed by the Central Phytosanitary Laboratory Bucharest

Localities within the county	Contaminated surface (ha)
1st locality	1,2
2nd locality	73,0
3rd locality	20,78
4th locality	26,0
TOTAL	120,98

The most important apple pathogens are those that cause diseases, namely: *Monilinia fructigena*, *Venturia inaequlis* and *Podosphaera leucotricha*. However, the most damaging one is the rosaceous fire blight or apple burn (*Erwinia amylovora Burrill Winslow*). Fire blight is a serious disease [5;

6] caused by an oligophagous bacterium attacking rosaceous plants of important commercial and economic value: fruit trees such as the apple, pear and quince, but also ornamental plants. In Romania the fire blight of rosaceous plants was first reported in 1992 in two different locations: Brăila and Mărăcineni Argeş [1]. However, in Sibiu County it was first detected in 1997, whereas in 2000 it was found in all Romanian counties [4].

The damages caused by the fire blight of rosaceous plants are enormous: desiccation of trees and loss of orchards, whose production is based on the entire lifetime of tree species (15-20 years), the pathogen being able to destroy a tree in only six months after the infection has taken place. The integrated protection of fruit tree orchards and nurseries is achieved by means of all measures contained in the integrated control scheme; and is to be performed by use of chemical means only under certain circumstances.

Since the challenge of reducing the negative impact of fire blight upon such cultures is a highly complex one, it is advisable to approach it from the perspective of a plurality of measures/methods:

- abidance by phytosanitary law and compliance with quarantine regulations ;
- avoidance of establishing plantations on soils which are wet and exposed to cold currents;
- use of healthy propagation material;
- culture hygiene after fall of leaves;
- removal of affected parts from the trees crown (by using tilts around trees);
- burning of all infected material;
- the elimination of vector insects represents an important measure of disease prevention;
- usual pruning will be performed during the period of vegetative repose;
- disinfecting used tools is mandatory for those orchards/trees that are affected (3% bleach, 4% formalin, 10% sodium hypochlorite);
- fertilization is performed as part of the entire complex, given the facts that nitrogen in excess renders apple, pear and quince trees more likely to be affected by fire blight;
- in case of warnings, chemical treatments (Table 2) will be performed with approved plant protection products.

Table 2. Surfaces treated in 2012 and estimated (expected) to be treated in 2013

Locality	Treated in 2012 (ha)		Expected to be treated in 2013 (ha)	
	Physical*	Conventional**	Physical*	Conventional**
1st locality	23	92	75	375
2nd and 3rd localities	111	351	120	600
4th locality	23	92	75	375

* physical treatment (real surface treated)
** conventional treatment (real surface treated x number of treatments on the respective surface)

On the affected tree farm both preventive and curative measures were applied. Cuttings were performed during the period of vegetative repose and during vegetation (at the first symptoms of disease).

Pruning was performed at a minimum of 50 cm below the point where symptoms occured;

- branches were destroyed immediately after pruning, implying a minimal degree of transportation, so as to prevent the bacterium from spreading;
- the tools used were disinfected with copper sulphate after every pruning;

After each pruning, phytosanitary treatments with plant protection products were applied

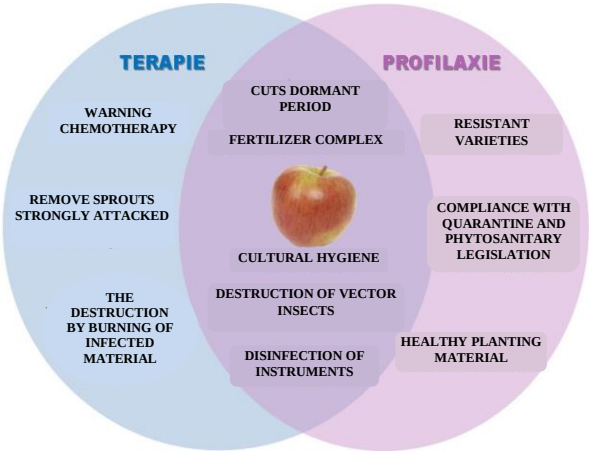

Fig 1. Scheme of integrated protection management (original)

The phytosanitary treatments were applied in the warning bulletins issued by the Forecasting and Warning Station belonging to the Phytosanitary Unit Sibiu. The plant

protection products employed were those approved for combatting the bacterium. The phytosanitary treatments were applied during the vegetative repose, namely before, during and after blooming, as well as at the moment of fruit growth.

Both the contaminated trees/crops, where the disease was confirmed, but also the trees in their surrounding area were treated. Thus, a new protection zone was created, therefore enabling the containment of the bacterium within the same perimeter for several years. On all of these areas the integrated management was applied, by combining agro-phytotechnical, physical, mechanical and chemical methods.

Economic and phytisanitary impact. Perspectives

The damages produced in orchards of apple, pear and quince trees place Romania among the worst affected countries, although the disease occurred in this region later than in other countries, which are less affected.

All holders of seedy tree species belonging to the *Rosacea* family, which are the bacterium's favourite host plants, have the obligation to check regularly whether there are any specific attack symptoms, such as bark cracks, gummy leaks, scurgeri gomoase, 'shepherd's crook' tip bending, inflorescence burn, twig desiccation and application of phytosanitary treatments.

The severity of the disease, together with the ignorance of some tree owners, and the lack of state support to owners of fruit orchards containing large areas covered by species sensitive to the bacterium *Erwinia amylovora*, are the main causes for the real situation.

Bacterial fire control is mostly based on measures of prevention of the pathogen, as well as on the introduction of the disease into non-endemic regions. The commercial implications of bacterial outbreaks are in fact exacerbated by the limited effectiveness of current control measures.

This pathogen causes considerable damage on sensitive host plants. It does not only destroy the crop of the current year, but it is also extremely dangerous for the plant itself. If weather conditions are favourable to the pathogen during blooming, the yield will be significantly reduced or even nullified. The following year would be affected as well due to damaged fruit branches. When it comes to sensitive host plants, the disease spreads very fast; and infected trees can hardly be saved, even if pruning is performed immediately after the acknowledgement of symptoms, and if a chemical treatment with approved plant protection products is applied.

CONCLUSIONS

Trees – no matter if scattered or in organized orchards – which are sensitive to the *Erwinia amylovora* bacterium (fam. *Rosaceae*) – can be very difficult to keep under control; and it requires a careful monitoring of plant health throughout the entire vegetation period, and if necessary, the application of preventive and curative measures at the right time.

In order to fight against the disease, an integrated programme is recommended, including chemical control, sanitary measures, pruning, eradication, controlled tree nutrition and employment of tolerant or resistant crops.

Fire blight is a serious threat to the EPPO Region (European and Mediterranean Plant Protection); and *Erwinia amylovora* represents an important organism on the EPPO list [2; 8]. Moreover, it is also listed as a quarantine organism for the numerous countries which are not affected by this quarantine disease [9].

The pathogen represents a huge risk for apple, pear and quince industries, as well as for nursery gardens and many sensitive ornamental plants.

The presence of fire blight in a certain country embodies an important constraint for exporters of host plants aimed for planting. Risks are even higher for Mediterranean regions due to climatic conditions, which are favourable to the development of the disease, as well as to the existence of wild host plants.

This pathogen has caused severe damage in the Mediterranean countries where it is present, a large part of susceptible crops having suffered considerable losses; and thus being on the brink of extinction.

In conclusion and on a quite pessimistic note, one must underline that the damages that this pathogen risks to inflict on ecosystems in general are rather unpredictable.

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INNOVATION POLICY IN AGRICULTURE AND RURAL DEVELOPMENT OF THE EUROPEAN UNION: PROSPECTS FOR THE REPUBLIC OF MOLDOVA

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Abstract

The future of the rural world has been the subject of much research in Europe and a large number of reports have been written on this subject. For the European Union, which aims to support rural development, it is essential to precisely define what a rural area is and even distinguish several different types of rural area. Rural areas are facing major challenges today which arise mainly from globalization, demographic change and the rural migration of young, well-trained people. Policies for rural areas aim to contribute to recognizing and making use of strengths and opportunities. Innovations have a direct influence on the level of welfare and satisfaction of each rural citizen and whole society. EU policies concerning innovations are aimed at transforming the European Union into a leading economy based on knowledge.

Key words: *agricultural innovations, rural economy, sustainable development*

INTRODUCTION

Agriculture continues to play an important role in rural areas, and in some regions it also contributes to economic growth. Small and medium-sized companies are certainly of even greater relevance, but many of them are again closely linked with agriculture in both upstream and downstream processes.
In the member states of the European Union, over 90% of the agro-food production and processing is still done in a conventional (industrial) way. The European Commission, recognizing the social and environmental dysfunction of this solution (confirmed in the Eurostat research) promotes organic farming and the so-called integrated agriculture (modern extensive agriculture). It is this second model, more strongly linked to innovation and to some extent – at least in terms of applying innovative solutions – similar to the idea of "precision agriculture", ultimately, can and should become a dominant in the integrated Europe.

MATERIALS AND METHODS

For revealing the problem scientific literature was used, Global Innovation Index and EU official data, the National Bureau of Statistics of the Republic of Moldova data and data derived from research conducted by author. Based on accumulated data calculations were performed for analysis of the main directions of European innovation policy to support agricultural development. For data interpretation collected and calculations made analytical method was applied, calculation was made with tabular method and graphical method.

RESULTS AND DISCUSSIONS

In order to counter the negative trends of development, heightened by the world financial crisis of 2007, the European Commission at the beginning of 2010 proposed for the member countries of the European Union to adopt the Program Europe 2020, which inherently is a vision of a modern, social market economy in the 21st century. The new development strategy has a chance to provide a fast and stable social and economic development in Europe with high rates of employment, including building a modern, innovative and globally competitive European economy. Putting its essence

briefly, it should be emphasized that the Program Europe 2020 includes three interrelated priorities:

Fig. 1. Main directions of the European program "Europe 2020"[1]

The European Commission proposed in this document the demarcation of several superior, measurable objectives of the EU to ensure the implementation of the following priorities [1]:
-the employment rate of people aged 20–64 age group should be 75%,
-on investment in research and development (R&D) it is appropriate to devote 3% of GDP of the Union,
-to achieve the objectives of the climatic-energy package – '20/20/20' (including the optional limit of carbon dioxide emissions by up to 30%),
-the number of those leaving school early should be limited to 10% and at least 40% of the people of the younger generation should earn higher education,
-number of people at risk of poverty must be reduced by 20 million.
In the opinion of the European Commission, with which do not necessarily agree all the EU member countries, the social, economic and territorial cohesion policy can effectively contribute to solving the major problems lying at the sources of the poor performance of the European Union in the field of innovation.
The Commission is publishing today a study analyzing the value of the EU name protection scheme for all food and agricultural products ("geographic indications" or "GIS"), including wines and spirits. [2]
60% of sales of European GI products took place in the country where these products originate, while 20% took place in other EU countries and a further 20% were exported outside of the EU. Extra-EU exports represented some €11.5 billion, mainly destined to the US (30%), Switzerland and Singapore (7% each), Canada, China, Japan and Hong-Kong (6% each). [6]
Over the period 2005-2011, wines accounted for 56% of all sales of food and agricultural products with a protected name produced in the European Union (€30.4 billion), agricultural products and foodstuffs for 29% (€15.8 billion), spirit drinks for 15% (€8.1 billion) and aromatized wines for 0.1% (€31.3 million).
As the European Commission underlines, the independent evaluations show that this policy had had previously a significant and generally positive macroeconomic impact, particularly in the less developed regions, with multiplier effect for the EU as a whole.

Table 1. Rural development in the EU – examples of actions to improve innovation in the European countryside

Austria *The diversification of production – processing flax fiber*	The received aid for the cultivation, harvesting and processing of fiber for the manufacture of thermal and sound insulation plates.
Denmark *Competitiveness – the investment in the quality of the dairy production*	The received aid for a dairy cooperative helped to modernize buildings, provide new devices and improve the quality control and the working environment.
France *The diversification of farms – ecologic cultivation of aromatic and medicinal plants*	The study work and investment aid allowed the creation of specialized agricultural holding with the cultivation of plants, processing and marketing and educational activities.
Germany *The diversification of farms and local services – creating a home for children*	The received aid for the conversion of barns into the house, providing social services, as well as creating alternative agricultural company.
The Netherlands *The countryside renewal and diversification of rural area – bakery*	The aid for the restoration of buildings and the creation of local bakeries: additional employment for the local population and improvement of amenities of life in the countryside.

In the opinion of the Commission, by mobilizing the existing growth potential in all

regions, the cohesion policy influences the more balanced economic growth in geographical terms and the increase in the growth potential of the Union. [5]

If the European Union in the next decade is to achieve the ambitious objectives of the Program Europe 2020 [2], all its regions must contribute to it, and in particular those that have a higher potential for productivity growth and employment.

The following EU schemes encourage diverse agricultural production, protect product names from misuse and imitation and help consumers by giving them information concerning the specific character of the products [3]:

PDO **-** covers agricultural products and foodstuffs which are produced, processed and prepared in a given geographical area using recognized know-how.

PGI **-** covers agricultural products and foodstuffs closely linked to the geographical area. At least one of the stages of production, processing or preparation takes place in the area.

TSG **-** highlights traditional character, either in the composition or means of production

Moreover – according to the Commission – this policy contributes to the strengthening of the economic and political integration, e.g. through the development of infrastructure network, improving the access to services of public interest, raising the level of professional skills in the Union population, increasing the accessibility of outermost regions (peripheral) and supporting of cooperation.

An integral part of the European program of development for 2014 - 2020 years is the close cooperation with neighboring countries in the field of agricultural production and innovation.

The agro-food sector plays a crucial role in Moldova, accounting in 2011 for 52 percent of total exports and 32 percent of exports to the EU, while the food processing industry ensures around 40 percent of country's total industrial production. [4] Besides its economic role, the sector has a central social function, especially in rural areas having limited economic opportunities and more difficult living conditions: more than half of the rural population is employed in agriculture, which reveals its fundamental importance for human development of the country. Due to its numerous social and economic ramifications and the possible negative competitive shocks on some local producers, farmers and workers, the liberalization of agricultural imports should be scheduled to take place over a longer period of time than in other sectors and even other countries, so that the producers will have more time to adjust and enhance their competitiveness.

Low productivity and poor competitiveness on the European market magnify the economic and social vulnerability of the Moldovan agriculture. Despite the fact that its share in total employment is about 27.5 percent, the agricultural sector accounts for only around 12 percent of GDP. [4]

Table 2. Competitiveness of the Moldovan agro-food Products on the EU market, RCA indexes in figures, year 2011

Products with competitive advantages		Products with competitive disadvantages	
Sunflower seeds	37.4	Cigarettes containing tobacco	0.9
Sunflower seed oil	10.5	Other food preparations containing cocoa	0.7
Edible nuts fresh, dried	8.0	Bread, pastry, cakes, biscuits and other bakers	0.5
Juices, other than citrus	5.3	Sugar confectionery (+ white chocolate)	0.5
Fruits, fresh, dried	4.8	Butter and other fats and oils derived from milk	0.3
Maize seed	4.2	Waters	0.3
Rape, colza, mustard seeds	3.3	Synthetic rubber	0.3
Molasses	3.0	Bulbs, cuttings, live plant	0.3
Grapes, fresh or dried	2.9	Food preparations containing cocoa	0.2
Bovine, equine hides, skin	1.6	Seeds, etc., for sowing	0.2
		Milk concentrated of sweetened	0.1

Surprisingly, most of the agro-food products for which Moldovan firms are least competitive in comparison with European ones have a relatively high processing level (butter, pastry, cakes, biscuits, food preparations, sugar confectionery). This may pinpoint to the problems related to scarce

capital, limited domestic production capacities and know-how, as well as poor compliance with international quality standards.

Nevertheless, it is important to bear in mind that not all agro-food products lack competitiveness. Moldovan agro-food products with high revealed comparative advantages are exported at a lower processing stage, serving in many cases as raw materials at the lower end of the production chains (e.g. maize seed, grapes, fruits, bovine skin). [6]

Two important agro-food sectors are worth pointing out as they have significant unexplored potential: animal products and honey. Currently, Moldovan animal products are banned on the European markets, while honey products have been banned until 2012, due to non-compliance with sanitary and phytosanitary standards. However, once the domestic quality system are upgraded and the standards – adjusted, these products are most likely to display much higher revealed comparative advantage on the European market. This is going to be a costly and time consuming process, requiring consolidated efforts and frank commitment from Moldovan policy makers.

Moldovan farmers should therefore acquire a good understanding of the production models of their peers in these countries in order to adopt the most competitive production and marketing strategies.

The markets where Moldova will meet the fiercest competition are in wheat, barley, fresh fruits, jams, fruit jellies, marmalades, fruit or nut pastes, juices, spirits, skin of bovine, rape, colza and mustard seeds. Besides EU countries, Moldovan producers will face strong competition from several non-EU states: Ukraine, Turkey, China, USA, Australia, South Africa and New Zealand. Additionally, exporters of wines of fresh grapes, which are considered strategic for Moldova, compete with Bulgaria, France, Italy, Luxembourg, Portugal, Spain, Australia, Chile and South Africa. [5] Besides the fact that it squeezes the profit margins, such a tough competition on the European market serves as a strong entering barrier for small producers due to financial and technological constraints and higher unit costs.

Since price is one of the crucial components of export competitiveness, it is worth comparing the export prices of the Moldovan producers with that of the main foreign exporters to the European market. For most of the top-10 exported items, Moldovan export prices are lower in comparison with their European competitors. However, this does not necessarily mean that Moldovan exports are more competitive. Some of them indeed may benefit of lower production costs, given the cheaper domestic labor force and other inputs. At the same time, smaller prices may reveal lower quality of these products in comparison with their European counterparts. Additionally, in some cases, this might be the result of the marketing strategies of Moldovan firms aimed at stabilizing their segments on the European market.

Table 3. Comparison of main Moldovan agro-food products exported to EU, year 2011

Commodity	Share in total agro-food exports, %	Main export destinations, % of total
Fresh and dried nuts	22.10	France (49.4), Greece (17.8), Austria (10.1)
Sunflower seed oil	12.60	Romania (83.5)
Sunflower seeds	11.10	UK (39.3), Romania (14.5)
Wine of fresh grapes	7.80	Poland (42.7), Czech Rep. (22.1), Romania (10.1)
Other wheat and muslin	7.00	Romania (31,8), UK (18,7)
Barley, unmilled	6.10	Romania (54.2)
Fruit juices	5.90	Germany (37.8), Poland (28.3), Austria (24.7)
Rape, colza and mustard seeds	3.80	UK (63,8)
Maize, other	3.10	Italy (37,3), Greece (29.5)
Dried fruit	1.70	Austria (43.7), Greece (19.5)

Table 3 reveals important changes in the structure of main items exported to the EU-27 in recent years. One can notice the decrease in wines share from 19.7 percent in 2006 to 7.8

percent in 2011, owing to Romania's accession to EU in 2007, as well as to the rather modest sector performance over these years. [7] This is also the result of too many domestic structural and institutional barriers hampering the competitiveness of wine producers, as well as the intense competition on the European market, making the diversification of exports away from Eastern markets a challenging task.

However, the competition that Moldovan producers face on the European market is by far more intense with firms from the non-EU countries. [4] For instance, Chinese exporters have a price advantage in exporting apple juice to the EU markets; US export prices are lower for walnuts, as well as for hides and skins of cattle; Ukraine has an advantage in producing refined sunflower seed or safflower oil and has the same prices as Moldovan producers for crude sunflower seed or safflower oil, wheat and rape or colza seeds.

The trade liberalization for the agro-food sector may bring both benefits and costs. In order to maximize the former and minimize the latter, the Government has to switch its policy priorities from protecting the domestic producers to enhancing their competitiveness through a better investment climate and higher compliance with EU standards. Additionally, a number of sub-sectors exist for which the trade liberalization should be much smoother in order to prevent eventual job cuts and foreclosures as a result of stronger competition with the European exporters.

From the economic side, the Moldovan agricultural sector is mostly represented by micro-enterprises which face low competitiveness and productivity; from the social point of view, there are no viable alternatives for raising revenues in rural areas, except for agriculture, which exposes hundreds of thousands of people to a significant poverty risk.

CONCLUSIONS

The agricultural and rural policy of the EU in order to ensure an increase in its productivity in relation with the activities for the improvement of its quality and the protection of the ecosystem will require, which gives little doubts, significant subsidies also in the new financial perspective for the European Union for the years 2014–2020. A similar assertion concerns the cohesion policy resources used for the modernization and rural development of the European countryside. The realization of the ambitious objectives of the Program Europe 2020 cannot and should not therefore be held at the expense of reducing the expenditure on the agricultural and cohesion funds, because its main objectives related to innovation can be successfully implemented in agriculture and in rural areas in Europe. So the relationship between the realizations of the ambitious objectives of the Program "Europe 2020" first exists, and second it is of bilateral nature. Indeed, it is difficult to imagine a vision of a modern European economy based on knowledge without taking into account the living and working conditions of millions of people employed in agriculture, agro-food processing industry or other professions of the countryside. Their proper development could in turn significantly affect the growth of aggregate GDP of the Communities.

To harness the development potential of the deeper economic links with the EU, while reducing the related risks, the Moldovan Government and businesses have to consider a number of actions:

-Despite the large amount of financial and technical resources, as well as time necessary to make the agro-food sector to align its international SPS standards, policy makers should consider as immediate priorities the adjustments of the quality standards for fruits and vegetables, which are among the most economically and socially important sectors. Introducing SPS in these sectors should not be financially very difficult, as standards are not very demanding

-Moldovan trade policy should concentrate on enhancing the competitiveness of Moldovan agro-food producers, rather than protecting domestic markets through tariff barriers under an indefinitely long time-horizon. Bringing

the domestic standards in line with the international ones and enforcing the domestic quality infrastructure are the key actions necessary for tapping the export potential of Moldova's agro-food sector. This is particularly related to SPS standards for meat products, dairy and live animals that are currently banned on the European market. As this is mainly related to low investments in the agro-food sector, increasing the investment attractiveness of these sectors should be a key policy objective.

-On a more technical, but still important aspect, it is necessary to relax the requirements for meeting the criteria of rules of origin for the EU market, which would have a significant contribution to the exploration of industrial sector's export potential. This issue becomes even more crucial given the high importance of re-exports for the sector, especially for clothing and clothing accessories - the most important exported product category to EU. Therefore, it is necessary for Moldova to adhere to the Pan-Euro-Med cumulating of origin system, which could ease the access of Moldovan producers on the European market.

-In the case of agricultural goods, Moldova can accept quite short transition periods of up to 3 years for such products like cereals, hides, skins, furs, oilseed, and oleaginous fruits. The longest transition periods (around 10 years) are advisable for some agro-food products, including butter, pastry, cakes, biscuits, food preparations and sugar confectionery. And there is a group of in-between products, which are quite competitively produced by Moldova but at the same time are going to meet equally competitive products originating from the EU, including wine, spirits, vegetable preparations, tobacco products, jams and other products. For these products, a transition period towards full trade liberalization should be shorter than for those with comparative disadvantages, but longer than for products with comparative advantages and target the interval of 4-7 years.

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WORLD PROMOTION OF ORGANIC FARMING

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Abstract

Organic farming is an agricultural sector that has experienced significant growth in recent years. Although it has become increasingly global important, the concept of organic farming is still not promoted enough. The main reason we chose this approach was afraid the article to find out more about what is actually organic farming, how widespread is the European Union. Bet on the study that we conducted on organic farming, we demonstrated the novelty of the issues that will bring much discussion and will be addressed in more and more. The role of organic agriculture is to produce food cleaner, suitable for human metabolism, in full correlation with environmental conservation and development. One of the main goals of organic farming is the production of agricultural and food products fresh and genuine processes designed to respect nature and its systems. Article demonstrates the major contribution of organic farming to sustainable development, increasing economic activities with significant added value and increase interest in rural areas.

Key words**:** *economic sustainability, global growth, organic farming, rural area*

INTRODUCTION

Organic farming is an alternative to traditional agriculture as a result of improper operation thereof and the causes which led to decreased resistance of plants, animal health and soil quality and thus human health. Organic farming is based in principle on increasing soil organic matter content by using natural fertilizers.
Romania has favourable conditions for the promotion of organic farming i.e.: fertile and productive soils, chemical processing and industrialization have not yet reached the levels of industrialized countries, traditional Romanian agriculture is based on the use of clean technologies, it is possible to separate perimeter green clean How to apply organic farming practices, the demand for organic products is growing, organic farming can become a source of employment to the rural population [1].

MATERIALS AND METHODS

The paper is based on the data and other information collected from EU data base and reports on organic farming. Analysis and synthesis methods were utilized in order to put into evidence the main aspects, features and trends in the field of organic farming.

RESULTS AND DISCUSSIONS

Area occupied by organic crops, worldwide in 2010 was 37 million hectares; the largest areas being cultivated in Australia, Argentina and the USA (see fig. 1).

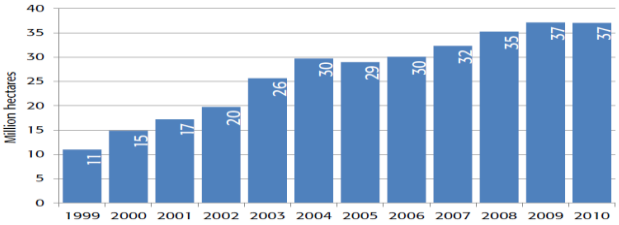

Fig. 1. Worldwide area cultivated by organic crops 1999-2010, Source: www.fibl.org

Ecologically cultivated area increased by 2 million hectares or 6% worldwide in 2009 compared to 2008. In 2010 organic cultivated area remains constant, 37 million hectares.
As in previous years, Australia is the country with the largest area under organic (12 million hectares). Argentina ranks second with an increase of 1.08 million hectares, followed by the U.S. (1.95 million hectares). Significantly increase organic acreage, made possible the

fourth of Brazil (1.77 million hectares), and followed by Spain (1.46 million hectares).
The 10 countries together hold 26.63 million hectares, which is more than three-quarters of the world total (see Fig. 2) [2].

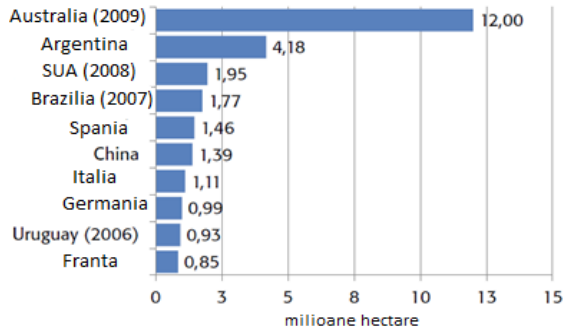

Fig. 2. Top of countries with area cultivated by organic crops in 2010, Source: www.fibl.org

Globally, in developed countries, there is a tendency to promote large-scale, organic farming. These trends are no exception for the European Union where there is a steady increase both in production and in the consumption of organic products (see Fig. 3) [3].

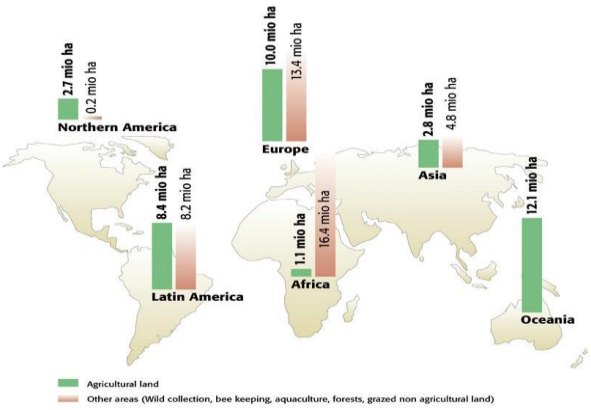

Fig. 3. Worldwide organic crops and others
Source: www.fibl.org

In Europe, 10 million hectares of land are farmed organically (including areas under conversion). This represents 2.1% of agricultural land in Europe. Ecologically cultivated area increased by 0.8 million hectares (or 9%) in 2010 when there were 280,000 registered producers [4].
In the European Union there were 9 million hectares of organic farmland (including areas under conversion). This represents 5.1% of the agricultural area in the EU, organic farmland increased by 0.7 million hectares (or 9%) were reported in 2010, when 220,000 producers.

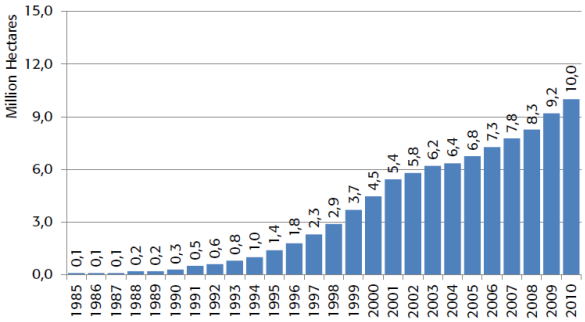

Fig. 4. Organic crops area in europe 1985-2010
Source: www.fibl.org

According to the chart above (see Fig. 4) it is an increase in the cultivated area from year to year, from 0.1 million hectares in 1985 to 10 million hectares in 2010.
Most organic agricultural area is in Spain (1,456,672 hectares), followed by Italy (1,113,742 hectares) and Germany (990,702 acres) (see fig. 5).

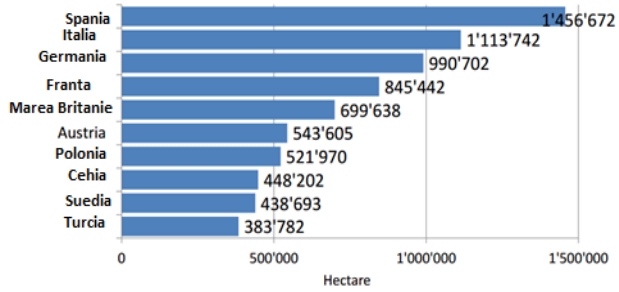

Fig. 5. Top 10 European countries with largest organic crops area 2010, Source: www.fibl.org

According to data provided by FiBL, organic farmland in Europe are eligible for use as follows: 45% permanent pasture, 41% arable, 10% permanent crops, and 3% other agricultural land. Of the total arable crops area is the largest grain (1709.7 thousand hectares) and green fodder (1583.8 thousand hectares). Smaller areas are occupied by protein crops, oil seeds and vegetables. Regarding permanent crops have the largest expanse of olive groves (367 500 hectares), followed by grapes (192 700 hectares), nuts (187 thousand hectares), fruit (94 800 hectares). Citrus occupies 31.8 thousand hectares (see Fig. 6) [5].

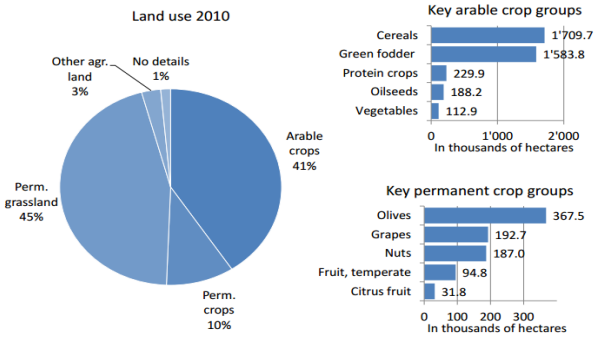

Fig. 6. Ecologic agriculture land utilization in Europe (total: 10 mil ha), Source: www.fibl.org

Organic market was estimated at 19.7 billion Euros in 2010, an increase of about 8% compared to 2009 in Europe, the European Union, turnover was 18.2 billion Euros, an increase of about 7% compared to 2009 (see fig. 7).

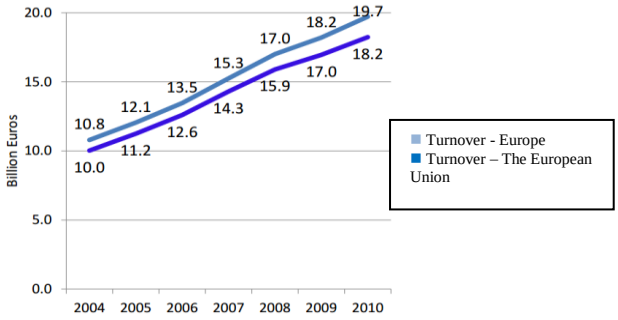

Fig. 7. Organic market growth 2004-2010. Growth 2009-2010: +8%, Source: www.fibl.org

The largest market for organic products was Germany with a turnover of 6,020 million Euros (30.5% of total), followed by France (3.516 million Euros - 17.8% of total) and the UK (2,000 million - 10.1% of total) (see fig. 8).

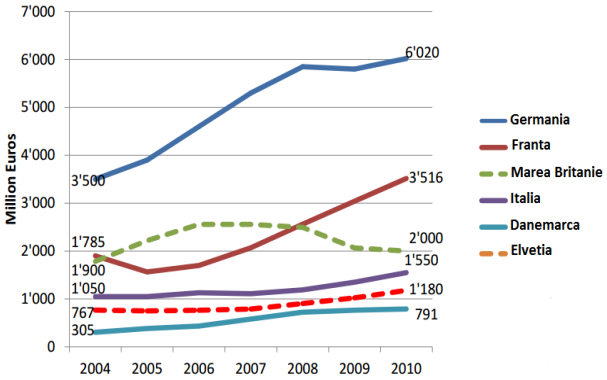

Fig. 8. Organic market development in couple European countries 2004-2010, Source: www.fibl.org

Among the European countries with the highest sales of food/drink green also include Italy, Switzerland, Austria, Spain, Sweden, Denmark and the Netherlands (see fig. 9).

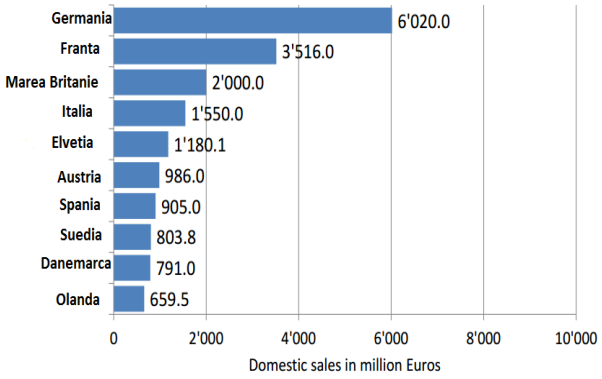

Fig. 9. European market for ecologic food/drink: Countries with largest sales 2010, Source: www.fibl.org

As a part of the total market share, the highest levels were achieved in Denmark, Austria and Switzerland, with 5% or more for organic products. The largest expenditures per capita are also in these countries and in Luxembourg (see fig. 10).

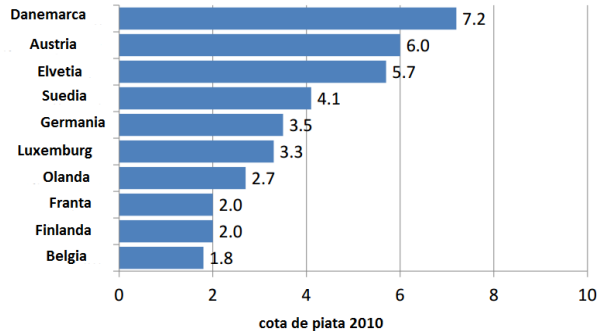

Fig. 10. European market for ecologic food/drink. Countries with largest market share 2010, Source: www.fibl.org

The largest increase organic cropland was in Europe, where the surface has increased by 0.8 and is about 10 million hectares (9% compared to 2009).
One third of the worldwide cultivated land is Oceania (33%), followed by Europe (27%) and Latin America (23%). Australia is the country with the most organic agricultural land (12 million hectares), followed by Argentina (4.2 million hectares) and the USA (1.9 million hectares). The countries with the most organic farmland are Falkland Islands

(36%), followed by Liechtenstein (27%) and Austria (20%).
At the global level are 1.6 million farmers using organic methods and about 80% are in developing countries. As in previous years, the countries with most producers are India, Uganda, Ethiopia and Mexico [6].

CONCLUSIONS

Agricultural future of this century is mainly focused on achieving healthy, maintaining soil fertility, optimizing agricultural production and the environment, without neglecting the issue of food security.
From the point of view of agricultural policy objectives, Romania has a very favourable position in the European Union.
The fact that Romanian agriculture fertilizer and pesticide consumption is 10-11 times lower than the European average, enable agriculture with emphasis on quality and quality means primarily organic.
As statistics show, the organic sector is growing and has the potential to be further developed. In comparison with the European average, organic farming is still underdeveloped in Romania, and the domestic market is still young.
Romania seeks to align global organic market trend, we observed an increase in both the consumption of organic products in the domestic market and the production and export of organic raw materials.
In the absence of domestic production to meet the demand for organic products as quantity, quality and diversity, most foods are brought from abroad.
Absence Romanian processors of organic products make that the only chance for local producers to export production. That is why in recent years the development of organic farming in Romania engine was exporting raw organic unprocessed.
The biggest problem of the Romanian market of organic products remains therefore that there are no processors. Romanian raw material is exported to more than 90 %, products are manufactured abroad and then return home four times more expensive.
In the absence of real agricultural reform to regulate land and agricultural credit market and encourage private holdings, however small they may be, and our country will not be able to capitalize on the current favourable moment when the world is looking more and more organic products.
Organic agriculture is a strategic objective quality of Romanian agricultural policy due to the contribution that the sector can have on economic development and lasting role in improving environmental conditions, soil preservation, water quality improvement, bio-diversification and protecting nature.

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SOCIO-ECONOMIC DEVELOPMENT PROSPECTS OF RURAL AREAS IN THE CONTEXT OF APPLICATION OF LEADER PROGRAM IN ROMANIA

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Abstract

Rural development policy is an important component of the Common Agricultural Policy. LEADER is an innovative approach to rural development policy in the European Union to improve the quality of life in rural areas. LEADER is a very effective way to support "smart" and to increase "sustainable" and "inclusive" rural areas, encouraging rural territories to explore new ways to become competitive, to capitalize at maximum their assets and overcome difficulties encountered, encouraging the socio-economic factors to collaborate in order to produce quality goods and services in their local area.

Key words**:** *local action group, local territorial development, rural development, the common agricultural policy*

INTRODUCTION

As the name "Liaison Entre Actions de Développement Rural" suggests, meaning „Links between actions for rural development", LEADER is a method of mobilizing and promoting the rural development in the local rural communities. The experience has shown that Leader can make changes to the daily lives of people in rural areas.

The countryside holds an essential place in the history, civilization and European identity. More than half of the EU population lives in rural areas, which cover 91% of EU territory. Also, the European rural space offers a large social, economic, cultural, historical and ecological wealth [2]. (Fig. 1).

Since it was launched in 1991, LEADER offered to rural communities from EU the tools to play an active role in shaping their own future. It has evolved over time, with the other common agricultural policies. Information arising from evaluations and brought by rural stakeholders show that the LEADER approach is a tool that works efficient in situations and different types of areas, by adapting decisions on rural to the extreme diversity needs of rural areas. Therefore, it has become an integral part of rural development policy.

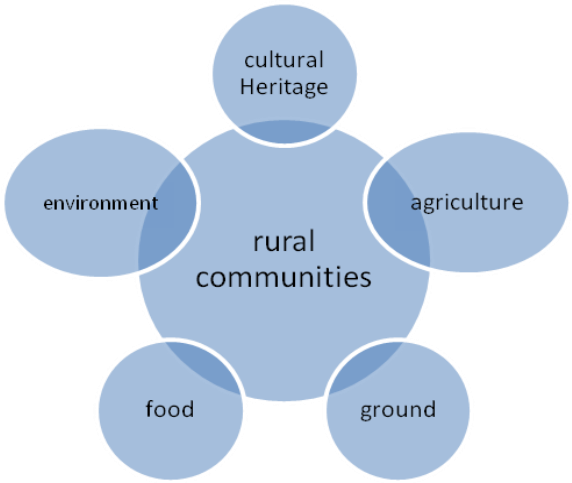

Fig. 1. Specificity of rural space

Since the inception of LEADER initiative it was intended to provide rural communities in the EU with a method for involving local partners in guiding the development of their area. For example, Leader actions can activate and mobilize local resources, supporting pre-

development projects (such as diagnostic studies and feasibility studies or local capacity building) that can improve these areas to access and utilize not only funds LEADER, but also other sources for their development financing (like broader EU programs, national or regional of rural development).

LEADER support sectors and categories of beneficiaries that often receive no support or only limited support through other programs operating in rural areas like cultural activities, enhancement of the natural environment, architecture and heritage buildings restoration, rural tourism, improving relations between producers and consumers, etc.

Encouraging the local participation in the development and implementation of sustainable development strategies, the LEADER approach has proved a valuable resource in the EU rural policy. There were three generations of LEADER Programme: LEADER I (1991-1993), LEADER II (1994-1999) and LEADER + (2000-2006). In the programming period 2007-2013, LEADER was included in all national / regional rural development programs. Because of this, it was possible to apply the LEADER approach on a much larger scale and in a much wider range of rural development activities.

For the programming period (2007-2013) the Council approved the Regulation no. 1698/2005 on the European Agricultural Fund for Rural Development (EAFRD) which emphasized more the approach in LEADER style. During this period, each rural development program must have a LEADER component for the implementation of local development strategies "bottom up". Member States or regions can select local action groups based local development strategies proposed by them. Each program can finance capacity building and encouragement necessary for the preparation of these local strategies, operating costs of LAG structures and implementation of local development strategies and cooperation projects between LAGs.

EU Cohesion Policy for the period 2014-2020 will pay special attention to areas with specific natural or demographic characteristics such as low population density and an additional allocation for the outermost regions.

The fundamental concept of the Leader approach is that, given the diversity of rural areas, the development strategies are more effective, if they are decided and implemented at local level by local actors. The difference between Leader and other rural policy measures is that it shows "how" to do and not "what" to do.

The Leader approach is based on the link between people, activities and territories. Local partnerships are established as local action groups and their establishment enables practical application of the concept of local partnership. Being a member of this partnership is to take part – to be associated, to make part - to assume responsibility, take action and participate in interchange [1].

On long term such a project encourages cooperation, local economic development by increasing investment and will result in economic disparities elimination and improving living standards.

MATERIALS AND METHODS

LEADER approach involves strengthening territorial coherence and implementation of integrated actions that can lead to the diversification and development of rural economy for the benefit of communities.

Another goal is the institutional construction for the development and implementation of integrated strategies that will enable rural stakeholders, representatives of different fields to work together and interact for the benefit of rural communities.

Development of rural areas by LEADER is scheduled and coordinated by local actors representing the decision maker and also bears the responsibility for development in regional areas demarcated to proceed.

This paper presents briefly the theoretical arguments for the introduction of the LEADER program and analyzes its implementation stage in Romania.

RESULTS AND DISCUSSIONS

With a total area of 238 000 km2 and a population of 19.04 million, Romania is, as size, the second new member state of the European Union, after Poland. It represents 6% of the total EU area and 4% of the EU population [4].

Romania is one of the European countries that enjoy a good resource endowment in terms of land, water and human resources. However, to date, these benefits had only a limited influence on the generation of significant developments and restructuring in agriculture and rural areas.

Rural areas have a substantial growth potential and a vital social role. According to the definition[3] from national legislation, rural Romania covers 87.1% of the country, comprising 47.2% of the population, namely 8.98 million inhabitants in 2011 [4].

Unlike most EU countries, agriculture has been and continues to be a sector of prime importance in Romania, both by its contribution in economy and the share of occupied population. Romanian agricultural sector performance remains relatively modest, in contrast to its natural potential and the population expectations on facilitating the financing system. The year 2011 marked the resumption of economic growth (of 2.5% compared to 2010), mainly on account of increasing the gross value added in agriculture, forestry and fishing (+11.3%), while exports have boosted growth in some industries (+5%) [7].

With a utilized agricultural area of 13.3 million hectares (representing 55.8% of Romania) in 2010, Romania has significant agricultural resources in Central and Eastern Europe. Although significant zones of used agricultural area are classified as less favoured areas, soil conditions are particularly favourable for farming production in southern and western regions of the country. Most of the utilized agricultural area is arable (8.3 million ha), followed by pasture and hay (4.5 million ha), permanent crops (0.3 million ha) and family gardens (0.2 million ha) (NIS, 2011).

Regarding the mode of use ("Use of agricultural land") and its evolution (from 2002 General Agricultural Census to that from 2010), due to a continuous reduction of the whole agricultural area used, there is a slight downward trend in the share of arable land and permanent crops in total utilized agricultural area, along with a slight increase of the share of pastures, hay fields and family gardens.

Unutilized agricultural land, registered at the General Agricultural Census 2010, including units that have not met the requirements to be considered agricultural exploitations, was 896 hectares and the agricultural area in rest was 953 000 ha [3].

The labour force in agriculture and forestry. The labour force in agriculture remains much oversized compared to other EU countries. Employment rate in agricultural, forestry and fishery activities remains high - 28.6% in 2011) compared to the European average (4.7%), and its performance in recent years (from 2005 - 31.6%) had not registered significant developments [5].

The rural intrinsic characteristics (relief, demography, small and spaced production units) make often difficult to extend technical and social infrastructure, which hinder the development of economic activities, contributing to widening gaps.

Rural areas face significant problems: low competitiveness of farms and rural enterprises, environmental and natural resources degradation (land, water, air, biodiversity) income lower than urban, lack of

[3]From the administrative point of view, Romania is organized at the level NUTS 5 in 320 municipalities (out of 103 municipalities - the most important cities) that form the urban areas and 2,861 communes, which are rural (31 December 2011) according to Law 350/2001 on spatial planning and urbanism and Law 351/2001 regarding the approval of the national land. In turn, the municipalities are mostly made up of several villages (there are a total of 12.957 villages), who have administrative responsibilities. For a community to become city has approved a specific law. Cities and towns are divided into counties (NUTS 3 level) administrative functions. The 42 counties are divided into 8 regions (NUTS2), not administrative functions.

workplaces, living conditions inferior to those of urban (in terms of public services and infrastructure).

Therefore, the EU rural development policy aimed at solving the problems facing rural areas in the EU and sustainable exploitation of their potential.

In Romania, based on Council Regulation (EC) no. 1698/2005 of 20 September 2005 on the support for rural development by the European Agricultural Fund for Rural Development (EAFRD) it was created the National Strategic Plan for Romania, which is the basis for the implementation of the National Rural Development Programme for 2007 - 2013.

European Agricultural Fund for Rural Development has been accessed since March 2008, after the approval of the National Rural Development Programme (NRDP).

The National Rural Development Programme 2007 - 2013 (NRDP), a document prepared by the Ministry of Agriculture and Rural Development, details the concrete mode in which investments are financed from European funds for agriculture and rural development.

The National Strategic Plan measures take into account the Community Strategic Guidelines that refer to rural areas. Depending on the analysis of the socio-economic and environmental situation, obtained from statistical data available, were set priorities and directions for rural development, in conjunction with community priorities.

By the National Strategic Plan 2007 - 2013 and afterwards through NRDP have been outlined four priority directions (axes) for funding by EAFRD:

-Axis I - Improving the competitiveness of agricultural and forestry sector - seeks reorganization and development of agricultural and forestry production and related processing industries to make them more competitive and contribute to economic growth and income convergence in rural areas (where possible), while ensuring living conditions and environment protection in these areas.

-Axis II - Improving the environment and the countryside - focus on maintaining and improving environmental quality in rural areas of Romania by promoting a sustainable management both on agricultural land and on the forest. The objectives of maintaining biodiversity and nature conservation is materialized by supporting forest conservation and development, ensuring a balanced occupation of the territory and sustainable management practices development of agricultural and forest lands.

-Axis III - Improving the quality of life in rural areas and diversification of the rural economy - aim to manage and facilitate the transition of labour from agriculture to other sectors to ensure adequate living standards of socially and economically.

-Axis IV - LEADER - is considering the implementing of local development strategies for improving administrative governance at rural level.

The overall objective of LEADER Axis is the starting and operation of local interest initiatives, using the approach "bottom up" by involving local stakeholders in developing their own territories. LEADER approach "bottom-up" is a way that allows local stakeholders to determine the needs of the area of origin and contribute to the territorial development of economic, demographic, educational, cultural, etc., through a development strategy elaborated and implemented locally.

LEADER Axis objectives are implemented "step by step", first focusing on activities of training local stakeholders and supporting territories to achieve development strategies. LEADER priority themes established by Commission are:

-best use of natural and cultural resources;

-improving the quality of life in rural areas;

-adding value to local products, in particular by facilitating access to local and regional markets through collective action;

-use of expertise and new technologies to make products and services in rural areas more competitive

Establishing a local partnership "local action group" (LAG) is an original and important

feature of LEADER approach. LAG has the task of identifying and implementing a local development strategy, make decisions on the allocation of financial resources and manage them. These groups can effectively stimulate sustainable development because they: gathers and combines human and financial resources available from the public sector, private sector, civic and voluntary sector; associate local players around collective projects and multi-sector actions to obtain synergies, joint ownership and critical mass to improve the area's economic competitiveness, strengthen the dialogue and cooperation between different rural actors, facilitating by interaction of various partners processes of adaptation and change in the agricultural sector (like quality products, supply chains) integration of environmental concerns, the diversification of the rural economy and quality of life.

Through the National Rural Development Programme 2007 – 2013, LEADER approach was first introduced in Romania according to the rural development regulation. LEADER is the method of "bottom up" (ascending) of involvement of local stakeholders for the implementation of rural development policy. LEADER approach complemented NRDP measures providing rural local communities the opportunity to explore new ways to become competitive as a result of exploitation of local assets, to preserve the environment, create jobs for the rural population and to increase quality of life.

By this time there were selected for funding a total of 163 local action groups of which 81 selected LAGs in 2011, of a public value of 227,554,390 Euro (fig. 2) and 82 LAGs selected in 2012, of a public value of 226,104,769 Euro (fig. 3).

LAGs area covered is about 142,000 km square, and in terms of population it is about 6.7 million inhabitants.

In terms of stage development strategies, up to 30.04.2013, a total of 973 projects have been declared compliant at LAGs, 555 projects were declared eligible and a number of 299 contracts were signed with APDRP [6].

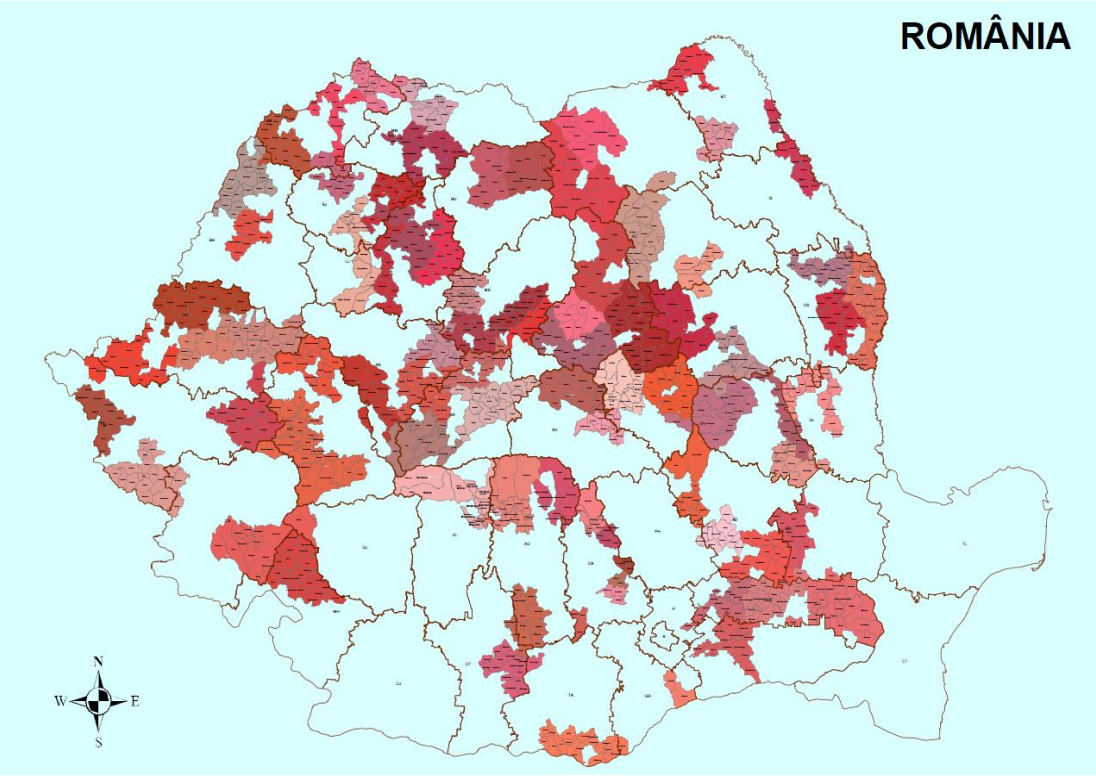

Fig. 2. Distribution of LAGs in Romania, 2011

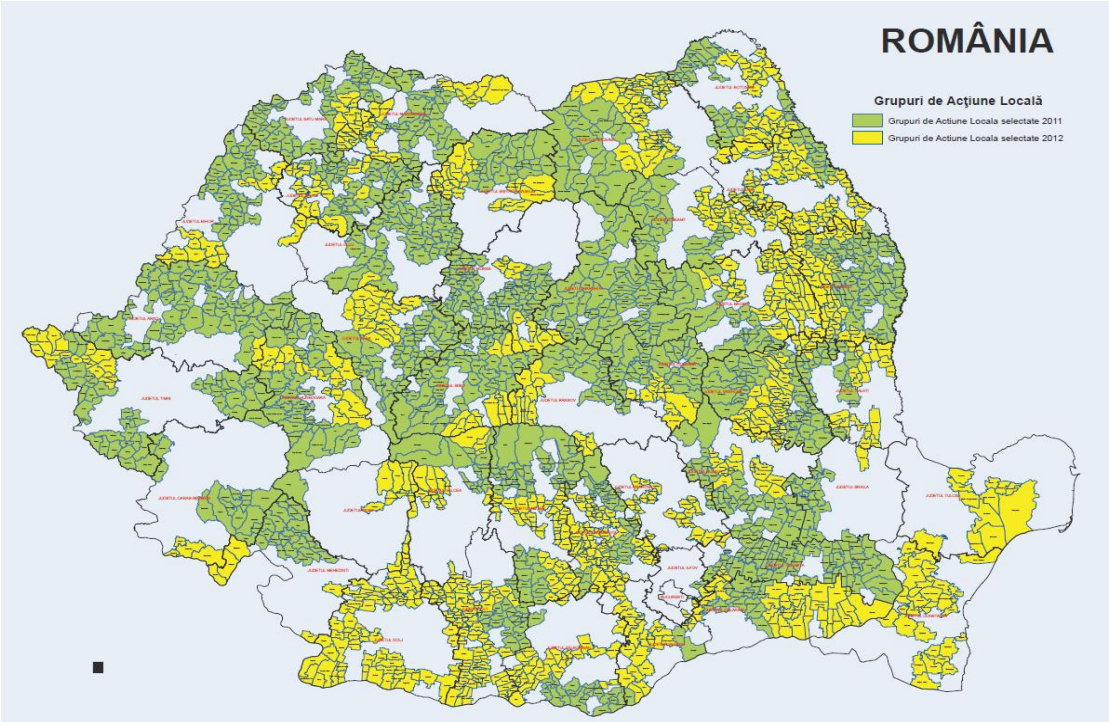

Fig. 3. Distribution of LAGs in Romania, 2011

LAGs address rural issues from a global perspective based on development strategies. Besides local partnership, the strategy is an essential element. This should take into account issues related to sustainable development and is based on potential endogenous development of the area selected. The main aim of the strategy is to create long-term development policies and each strategy is based on a detailed analysis of the situation of the area, in which the potential and development opportunities should be clearly identified. Each strategy contains:

-area characteristics (geographic, economic, demographic, sociological)

-SWOT analysis of the area (development potential of the area)

-area development vision (objectives, priorities, target groups and expected results)

-operating strategy (approach "bottom-up", time schedule, innovative actions and activities transferability of shares and activities)

-harmonization with the development programs of other LAGs.

Analysis of the territorial distribution of LAGs reveals a stronger concentration in the west and centre of the country and a reduced distribution in the south. Looking from the perspective of Romania's economic disparities between regions, respectively between the west and centre of the country much more developed and economically homogeneous and the south and north-east of the country, proliferation of LAGs can find the explanation, in conditions in which a better local infrastructure provides a favourable environment for stimulating LEADER initiatives. In addition, the west and centre of the country is characterized by a longer tradition regarding associative structures (crafts, handicrafts, etc.) and this element itself can be considered a contributing factor in mobilizing local initiatives.

Local development initiatives represent a possible solution to address the economic disparities among regions and will gain increasing importance, given that the European Commission emphasis increasingly local development under community responsibility (CLLD). It intends to launch in the next programming period new project calls for LAG, using LEADER experience in terms of local development.

For the programming period 2014-2020 Draft Regulation on the future CLLD (Community Led Local Development) is based on the LEADER approach and refers to all funds

covered by the Common Strategic Framework (CSF): European Regional Development Fund (ERDF) European Social Fund (ESF), European Agricultural Fund for Rural Development (EAFRD), European Maritime and Fisheries Fund (EMFF) and the Cohesion Fund (CF). CLLD is a specific tool used in the sub-regional level, which is complementary to other forms of support for local development.

CLLD can mobilize and involve local communities and organizations to contribute to achieving the Europe 2020 goals: encouraging the transfer of expertise and innovation, increasing competitiveness, strengthening food production chains and risk management in agriculture, restoring, preserving and enhancing ecosystems, promoting efficient use of resources and the transition to a low carbon emission economy and promoting social inclusion, poverty reduction and economic development in rural areas.

In the period 2014-2020, the support more explicit, in a form of a common legal framework and harmonized rules for the five CSF funds, will increase consistency and encourage local strategies financed by multiple funds, Community Led.

In the new draft Regulation of the European Agricultural Fund for Rural Development, the proposed measures emphasize that special attention is given to the different categories of farms, activities or certain areas:

-Young farmers: they are considered guarantors of the future of agriculture in that they can bring energy and new ideas for this sector. At present, they are faced with various problems, particularly in terms of access to the land and credit.

-Small farms: they have a special contribution to the diversification of products, habitats preservation, but in some areas of EU face different challenges than those faced by larger farms.

-Mountain areas: in many cases, they provide outstanding products and attractive ecosystems. However, mountainous areas may face special challenges regarding climate and isolation.

-Short supply chains can bring economic, social and environmental benefits (by securing a greater share of the added value for farmers, reducing carbon footprint, by encouraging distribution of food, and by promoting face to face contact between producers and buyers). It may be helpful to reduce the distance from producer to consumer.

-Special agricultural sectors: they exist in some parts of the EU and have a significant impact on specific rural areas that need restructuring.

Configuration of the future European policy on agriculture and rural development has been presented (after extensive public consultation and based on a large number of impact studies performed previously) at the end of 2010[4] and after a year, in October 2011, the European Commission presented legislative proposals for the future CAP[5] which would, as noted Commissioner for Agriculture, Dacian Cioloş, "a new partnership between Europe and farmers to meet the challenges of food security, sustainable use of natural resources and economic growth" [7].

[4]Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Brussels, "Common Agricultural Policy at the horizon of the 2020: how to meet the future challenges related to food, natural resources and territorial balance" of 18.11.2010; Communication from the Commission the European Parliament, the European Economic and social Committee, Committee of the Regions and the European Investment Bank: "Conclusions of the fifth report on economic, social and territorial cohesion: the future of cohesion policy", from, 9.10.2010; Commission Communication to the European Parliament, the European Economic and Social Committee and the Committee of the Regions "A Budget for Europe 2020" from 29.06.2011

[5]For CAP, seven proposals for regulations, among which "the direct payments regulation", „Regulation on the common organization of the unique market", "Rural Development Regulation", "horizontal regulation on the financing, management and monitoring of the common agricultural policy" presented in October 2011, and the proposal for a regulation on cohesion policy.

CONCLUSIONS

The model LEADER of planning and management of local resources will meet the following main requirements:
-development of plans to increase regional competitiveness on long term, in conjunction with other sector policies: agriculture, local crafts, infrastructure, environmental protection;
-opportunity to become a support for new businesses and jobs and to determine a new development locally and regionally;
-encouraging local traditional activities, but also those that may cause the development of specific trade and create new jobs;
-increase revenue of rural inhabitants, generated through local resources;
-dynamic factor in the process of increasing the quality of life in rural areas;
-formation of a viable, competitive agricultural sector, able to produce at high standards in terms of efficiency;
-promoting healthy production and respectful for environment methods, ensuring quality products at reasonable prices to meet consumer concerns regarding food safety and comfort of the animals;
-development of the agricultural sector to bring a significant contribution to the revitalization of the rural world;
-diversification of economic activities for creating alternative jobs and new income opportunities for farmers, multifunctional development of the rural space and its improvement for the benefit of future generations;
-increasing the role of local communities in decision-making.

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THE ANALYSIS OF COUNTERFEITING FOOD PRODUCTS

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Abstract

The issue addressed in this paper makes a significant contribution to research on the effects that food tampering has at the expense of consumer health. Nowadays quality and food safety that consumers are entitled directly reflects the quality of life. In other words the present subject is of particular importance to the work of the bodies created for the purpose of protecting the health and quality of life of consumers. This study has an important role both in the short and long term through proper understanding of the terms of quality, adulteration and food safety. The essential aim of this article is played understanding and easy identification of counterfeit food. Thus the awareness of counterfeit food products consumers are becoming more aware and responsible on quality of life. Quality will always be one of the most important competitive factors of ensuring health and environmental protection.

Key words**:** *analysis, consumers, counterfeiting, food products, food quality*

INTRODUCTION

Currently the entire population has a tendency to move towards a more balanced, healthy and natural diet. Counterfeiting food is not particularly a problem of modernity. In my opinion the food counterfeiting has grown due to increased competitiveness. Addressing this theme comes in support of the idea of consumer recognition of counterfeit food. Intensify the problems of counterfeit food products are increasingly causing more uncertainty. An absolutely necessary tool in the analysis of food counterfeiting is the eco-label that provides information about the environmental impact, promoting low impact products due to the health and quality of life. At present, economic entities granted increasingly more importance upon demonstrating healthy environmental performance by identifying the food to be easily forged. Parallel public opinion became increasingly interested in environmental issues than they frequently reflected in consumer behavior, showing interest in products that are not harmful to the environment.

MATERIALS AND METHODS

In this paper, the study of literature has been used with regard to the evolution of counterfeited food products. In other words, the materials used in this research are making direct reference to the study of literature and related data processing as a result of the research made for the action of counterfeiting food products. The analysis refers to the food products in our country that are daily counterfeited. I also debated the percent of milk safety in India as an example of food products that conform with health and safety standards. [1]

RESULTS AND DISCUSSIONS

This section presents the evolution of counterfeiting food products. According to literature forging operation can be defined as obtaining a product similar to another already on the market, the operation carried out in order to deceive, "to fool the consumer" and obtain illegal income. Due to the amplification of the phenomenon of counterfeiting of food and the danger it presents their counterfeiting in our country and abroad have taken a series of measures for

prevention and sanctioning of any falsifications, especially among food. Actions such as fraud, counterfeiting goods and substitutions are part of the fraudulent goods category, which measure human society development took on a large scale. Among the potential sources of fraudulent goods we can identify: market economy based on free adjustment of supply and demand; broadening and deepening trade and international markets and increasing the number of traders involved in a process chain.

Thus we redefine falsification as a fraudulent transaction that is to change the weight ratio between the components of a product. The infringement is ascertained at the time of the product introduced in trade composition and quality indices change from normal ones or declared. Replacing a product involves modifying its composition by replacing part of one or more substances with others, quality and lower value.

Currently due to the intensification of this phenomenon are promulgated and implemented in more and more laws, rules and regulations that support and protect consumers and ensure quality of life.

Such use or substitution of goods or any other products and exposure for sale or selling actual goods of this kind, aware that they are counterfeited or replaced are illegal commercial activities and entail criminal or administrative liability. he falsification or substitution in quality is represented by any deception or attempted deception on the nature, quality characteristics, composition, content of useful substances in the product replacement of other harmful substances, and falsifying name, description, or other misrepresentation as to the origin, quantity and identity of the goods or services that contribute to determining the amount or quality of product or not. Food safety is a key factor in the delimitation of counterfeit products. Signifies the element of food security and human nutrition that refers to features which should satisfy any food component. [2] They refer to the nutritional value of the products and to identify and respect hygienic qualities. In accordance with the hygiene requirements relating to the protection of health related foods presented and implemented by the Ministry of Health, define food falsification as an admixture of any natural or synthetic substance in products in order to hide the defects related to food products, but also with the aim of changing the unjustified property or construction through their natural composition and manufacturing standards that will affect the quality of the value of such products. In other theorists falsification concept is presented as the operation of obtaining and marketing of products that are actually almost accurate copies, lower quality of original products marketed fraudulently operation carried out with the aim of having unlawful income.

Food security

Through the intensification of the term emergence of more and more counterfeit and fake products in both food (as well as in other fields), food security has become a crucial factor appeared any time where all people have physical and economic access to food reliable and nutritious food that meets the needs of the human body so that they can lead a healthy life. This is a highly publicized issue both nationally and internationally. It also should be noted that Earth\'s population nutrition international expansion is a concern to WHO (World Health Organization), FAO (Food and Agriculture Organization), the Codex Aliment Arius Commission, etc.. Food safety is an essential element of food security and human nutrition, which must possess the following characteristics: to have intrinsic nutritional value, nutritional value as high bioavailable and always hygienic qualities [3]. In qualitative terms, the concept of food safe, healthy and nutritious includes a variety of items. We discuss the one that contains all the nutrients and biologically active substances that man needs for health maintenance and prevention of chronic diseases, being a food without toxins, pesticides, chemical and physical contaminants and pathogens without the type of bacteria and viruses that can cause various diseases.

Study on presenting the forged 11 commonly consumed foods existing in

Romania[6]

Many of the foods consumed on a daily basis are counterfeit; starting from meat and dairy to honey, cereals, breads and drinks. Thus we can draw up a list of the foods consumed counterfeit:

1. Olive oil and olives

Currently virgin olive oil is one of the counterfeit foods. One of the methods commonly found counterfeiting is the replacement of parts extra virgin olive oil is the refined form or with another type of oil, such as the soybean inferior quality. Olives can be falsified by the oxidation of iron glucometer in order to obtain a uniform color and are preserved in salt can cover any change in taste due to alteration.

2. Flour

In this case falsification can be achieved by mixing: other cereal flour or foreign seeds (corn, peas, beans, rice), common wheat flour durum wheat flour, potato starch or corn, improvers, emulsifier and oxidation banned or over dosage allowed substances to increase shelf life and to accelerate maturation or bleaching flour.

3. Wild salmon

The easiest way of falsification of fish is selling cheap fish species such as salmon or other fish. Wild salmon is known by the fact that it has a high level of Omega 3, which protects the heart system. This is not valid in case of salmon or rainbow trout culture, cheaper species with that salmon is often replaced.

4. Meat

The only method of falsification of whole meat is the marketing of less consumed species such as donkey meat; horse etc. as pork or beef. Most often are falsified minced meat and sausages small by replacing valuable ingredients with some to avoid: fat, rind, tendons, ears etc. Can be added for color and flavor additives, soya flour consistency and excess salt or spices to mask spoilage. It can also be counterfeited by subjecting to ionizing radiation used to extend the shelf life of products, and to accelerate maturation and defrost.

5. Sausage

Most contain mechanically deboned meat, leftover meat on the bones remain. Thus has a lower nutritional quality and may contain fragments of bone, cartilage, tendons and skin. Also this mix is added to a variety of E- in order to provide a true meat-like colors and holding a sweet taste.

6. Milk

Frequent spoofing is achieved by adding water by extraction of the fat cow's milk by mixing with the sheep, by preventing the concealment of defects, or alters it by maintaining acidity installation with the addition of neutralizing substances or preservatives.

7. Cheese

Are forged through partial replacement of proteins of milk with egg white powder, blood plasma or vegetable origin proteins derived from peas, grain or soy.

8. Cream by adding flour, gelatin, skim milk, chalk or gypsum.

9. Butter can be counterfeited by replacing milk fat with other fats shoddy animal or vegetable.

10. Honey

For example honey sold as Acacia (made aware as an expensive assortment) can be, in fact, polyclonal honey or rape, with lower benefits. Likewise for multiplication of honey, many manufacturers add corn syrup industries, which diminish the nutritional value. It seems that the safest is honey candied, crystallized.

11. Coffee

The most known and used types of coffee are Arabica, high quality, robust, less flavorful and cheaper. The easiest way of forging a coffee marketed as high quality robusta coffee is the addition of a rate greater than arabica. It is possible that some packs of coffee "quality" to find chicory, malt, chickpeas, corn, starch, caramel, soy beans, peas or beans.

The European system of food safety

The implementation of such a system requires a legislative development of the field, and performing actions in the idea:

[6] Data processed by the author in accordance with the opinion of Professor Gheorghe Mencinicopschi, director of the Institute of Food Research.

-Ensure implementation of management and control systems for efficient and effective regarding food safety and quality, animal health and animal feeding, as well as plant health EU member countries inside and outside the community which exported food in the EU and are evaluated according to European standards relating to the field under study.
-Sound management of foreign relations with countries outside the EU and other international bodies and organizations on food safety, their quality and other associations.
-Management and supervision of relations with the European Food Safety Authority - European Food Safety Authority (EFSA) and ensure the prevention of possible risks.

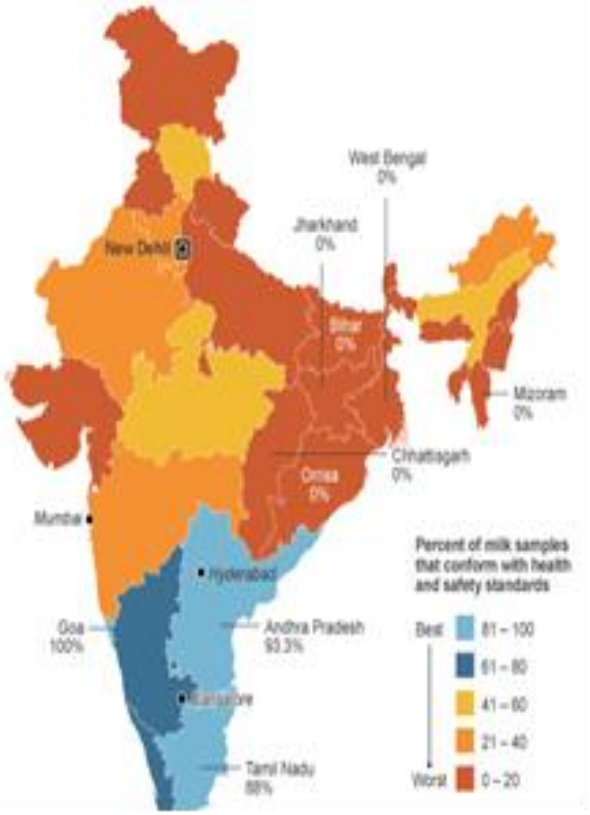

Fig. 1. The percent of milk safety in India as an example of food products that conform with health and safety standards
Source: www.fhrai.ro - Food and Safety Standards Authority of India

CONCLUSIONS

In pursuit of profit contemporary society has led some manufacturers to make compromising quality standards and to fool consumers using cheap ingredients, to the detriment of our health.
In terms of food quality found a safe, healthy and nutritious includes a variety of items.
That means a food that contains all nutrients and biologically active substances that we need to maintain health and to prevent the occurrence of chronic diseases.
In addition, we are talking about a toxin-free food, pesticide, chemical and physical contaminants and pathogens such as bacteria and viruses that cause diseases.
According to the EU and the World Health Organization, food quality and safety should be based on the efforts of all those involved in the complex process that begins with the origin and ends with when they reach the board.

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THE DESIGN OF AN INFORMATIC MODEL TO ESTIMATE THE EFFICIENCY OF AGRICULTURAL VEGETAL PRODUCTION

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Abstract

In the present exists a concern over the inability of the small and medium farms managers to accurately estimate and evaluate production systems efficiency in Romanian agriculture. This general concern has become even more pressing as market prices associated with agricultural activities continue to increase. As a result, considerable research attention is now orientated to the development of economical models integrated in software interfaces that can improve the technical and financial management. Therefore, the objective of this paper is to present an estimation and evaluation model designed to increase the farmer's ability to measure production activities costs by utilizing informatic systems.

Key words**:** *agriculture, efficiency, informatic systems, profitability, vegetal*

INTRODUCTION

Any modern agricultural unit, regardless of size, shape, profile property and socio-economic space in which operate, requires a management style based on flexibility, dynamism and foresight, which is inconceivable without an operative information, complex and quality to provide the basis to take decisions [2]. The continuous development of informatic technologies designed for agriculture can have a real impact on improvement of productive activities and agriculture efficiency.

MATERIALS AND METHODS

Improving competitiveness requires that any farm to develop a particular project for production management, which will include both the flow of production factors and the flow of information relating to the scope [1]. In this context, informational systems have a great contribution to the purposes of the informatization management issues of complex problems and in particular for the apriori analysis of data elements of managerial problems, particularly for the analysis of profitability and production factors [4].

RESULTS AND DISCUSSIONS

In fact, the informatic model was materialized in the form of logical scheme and it's the depart point for the multiple data and variable correlated trough various economical functions in the software application.
The main purpose of the model is to make viable estimation and evaluation of production systems for different crop structure. The estimation part of the model is based on tree component forms: crop technologies, crop budget and crop indicators. The evaluation part is structured also on tree component forms: data collection form, administration form, output report form. The components of the model are illustrated in figure 1.
Each form requires data and variables in concordance with the particularities that each agricultural product presents. However, we can identify tree general types:
I.*The variables* - are external data that are depending on the objective fallowed, such as: characteristic of agricultural farm, type of culture, animal category, production area (plain, hill, mountain)/ production system (irrigate, not irrigate), used agricultural area, costs for the mechanized tilling, costs for the

manual work, costs for raw materials and materials, price for selling the first production and the second one, subvention on hectare, the afferent rate for types of costs (provisioning, general and management ensuring, with loan interest), value for other types of costs (sinking fund, taxes), the initial balance [10];

II.*The constants* - represents the classified lists and intern tables like: crop table, manual working table, mechanized working table, the table of contents and materials, the table of annual necessaries (monthly allowance on fodder), the table of fito-sanitary actions for every crop, the table of pesticides (fungicides, herbicide) etc. [10]

III.*The outputs* - are those data witch the system generates after the loading of the outgoing variables and constants, defined former, having on the base the algorithms calculus specific for every project module; examples: the technology of crop/ha, the technology of crop/agricultural farm, crop budget/ha, crop budget/agricultural farm, other reports comparative estimate/achieved.

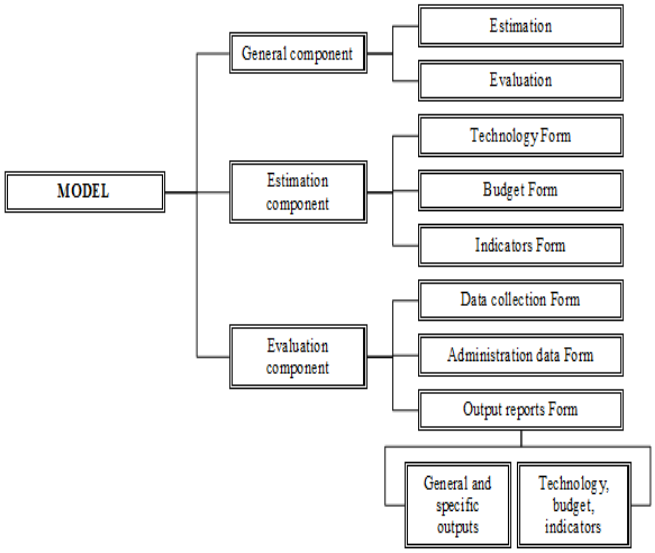

Fig. 1. General model components

The role of processing data, which together with the organization and communication system constitute the computer system is to cover mainly the following requirements [5]:

-to satisfy most needs of farm processing, the existence of as many applications;

-to provide information required for the system object, synthetic or analytic, if is applicable;

-be technically efficient, reliable and quality required by standards;

-be cheap;

-contain the necessary equipment, properly sized processing requirements;

-to ensure operation in "real time" and secure ordering process, where applicable;

-provide necessary data storage and archiving;

-to work in the specific agricultural environment;

-the ability to work on subsystems

-be developed both in terms of hardware and software;

-to ensure data integrity and security;

-provide the processing needed to transmit the necessary information communication systems;

-be easily implemented and exploited;

-be close to the user;

-lead to increased farm efficiency and overall management of all processes in particular.

Analysis of the agricultural units is subject to the range and depth of system indicators used and capacity information of each indicator is a numerical expression of an economic process or phenomenon, defined in time and space and can be characterized by absolute size, relative sizes, size average indices and coefficients [6].

In agriculture, the specific activity is given the role of land in production. In examining economic efficiency is emphasized that the degree of capitalization of the productive potential of the land, the resources available in the soil, using a set of specific indicators such as average yield per hectare by type of crop production expressed in units natural (tones) per per unit of cultivated area, production value or net income per unit area, intensive land use coefficient obtained by dividing the total area (national) aggregate surface by category of land converted into arable land conventionally [9].

Any plant-growing system comprising a series of elements embodied in various crops and biological resources, technical, material and labor combined depending on the

climatic, economic and social, for the purposes of increasing amounts of crops with greater economic efficiency [7].

In determining the efficiency of crop production systems we need economic information such as the following:

-*Production costs (operation)* – this compares the totality of inputs and services consumed in agricultural production, distinguished two categories: variable costs (operational) and fixed costs (the structure).

-*Standardized variable costs* - these are direct costs related to production activity. They depend on the nature of the activity (culture), and is proportionate to the volume of the respective culture (seed, fertilizer) or output (packaging etc.). At the level of farms specialized in crop production, variable costs include:

- Seeds and planting material,
- Chemical fertilizers and manure,
- Plant protection products,
- Fuel for drying, heating etc.,
- Temporary labor (salary + salary costs),
- Water irrigation project expenditures,
- Crop insurance,
- Marketing costs: packing, sorting, cleaning.

-*Fixed expenses* - these are expenses related to holding structure are independent of the nature, scale and intensity of the activities (cultural) within a year agricultural holdings. They should be supported even when land is cultivated and mainly include [8]:

- Lease,
- Permanent labor costs (salary + salary costs),
- Maintenance of equipment and buildings,
- Fuels and lubricants,
- Repairs to buildings and equipment,
- Interest on production loans,
- Depreciation of equipment, buildings, land improvements,
- Land tax,
- Expenditure etc.

The estimation component of the model contains technical data concerning the optimal use of inputs elaborated by research institutes which constitute the specific constants of the system (fig.2). The equations of the system model use these constants along with and the input data. These last types of data are in majority variable, but they contain also a list of values that the operator can select the databases that were previously populated.

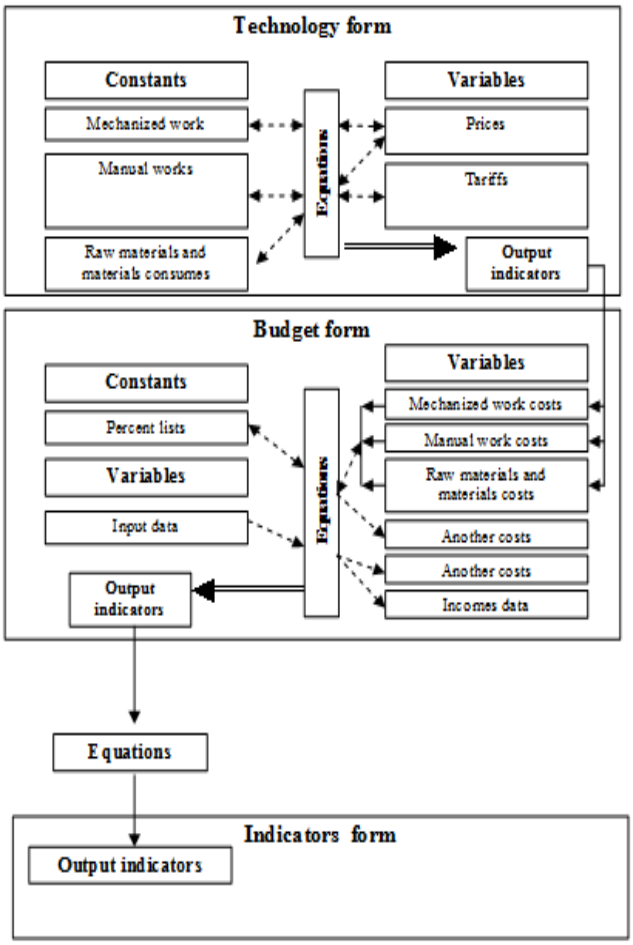

Fig. 2. Model data correlations/estimation component-vegetal production

The evaluation component of the model is based on different input data requirements which are integrated in economical correlations that permits the calculation of crop/animal technologies, crop/animal budget and crop/animal indicators (as shown in Fig.3).

CONCLUSIONS

Total economic effects that are found in one form or another in financial results of a farm as a result of their system contribution to

increasing physical production, reducing direct production costs and general running of the unit are a direct result of the quantitative and qualitative effects of system components through which it provides necessary and sufficient information for management and operation of the technical work, production, financial and economic, social and administrative.

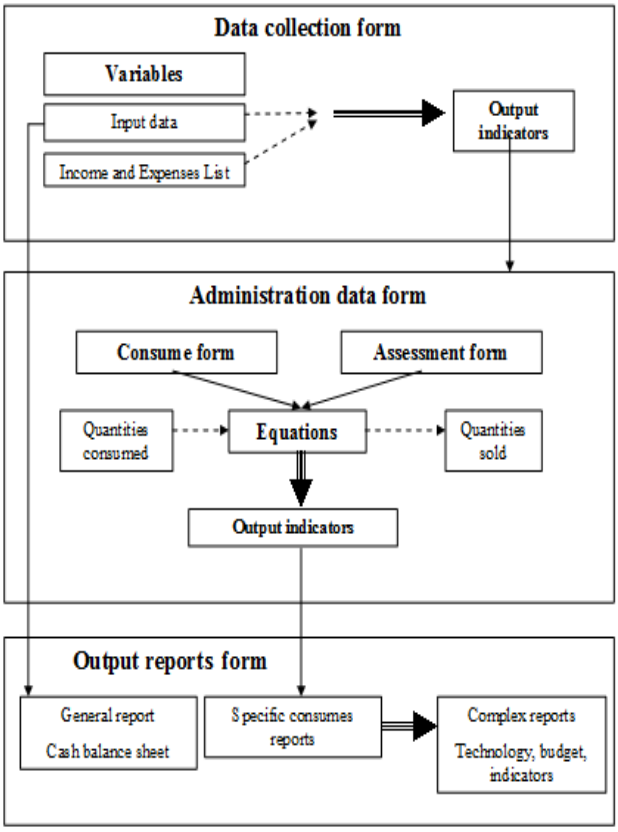

Fig. 3. Model data correlations/evaluation component

In the present, agricultural practices is influenced by the knowledge of the farmer regarding both the economical and technological aspects of production. It is important for him to know how to estimate and evaluate production costs under various prices and operating conditions. However, like we mentioned before, many farmers have difficulties trying to estimate and evaluate production costs or do not have the proper tools available to economically evaluate input use strategies [3].

Use of information technology in support of specific activities on the agricultural sector is a matter of great topical interest, under the terms of a society increasingly based on informatization, where markets are becoming more competitive, with consumers.

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