

VARIANCES BETWEEN CONTRACT AND NON-CONTRACT FARMS IN THE USE OF SUSTAINABLE FARMING PRACTICES: CASE STUDY

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Abstract

The present paper aimed to investigate the main characteristics of contract farming versus non-contract farming from Dornelor Basin, Suceava county. The research was based on a large-scale survey conducted in the study area, the data being collected from 52 farms who raise dairy cows. The results reveal that contract farmers are, generally, younger, have a slightly higher education level, with more years of agricultural experience and have larger farms, both in terms of size and number of animals, but they express a lower degree of willingness to uptake sustainable practices in comparison with non-contract farmers. Still, it looks like contract farming could represent a viable support instrument to farmers for converting to more sustainable practices. One possible way of achieving this is by creating a connection between contracting and the adoption of ecological farming methods and by supporting farmers with inputs and training in sustainable agricultural practices.

Key words: contract farming, sustainable agricultural practices, livestock farming

INTRODUCTION

Over time, agriculture has been an income source and a way to improve the socio-economic status of the population.

Environmental protection has become an important issue for mankind in recent decades. New directions of thinking, innovation and methods to protect the environment have appeared. One such direction is sustainable agriculture, considered as the production of agri-food products, crops and animal products, obtained through agricultural practices that provide benefits for the environment and population and support economic profitability [6]. Briefly, sustainable agriculture is a more ecological farming practice though the promotion of economically, ecologically and socially viable methods and practices [15]. A sustainable food system does not require the use of chemicals, conserves energy and water, while focusing on local production, reduces inputs and uses local resources more efficiently, values biodiversity and ecology and operates within global natural resource limitation. As

opposed to conventional agriculture, sustainable agriculture holds an important potential to benefit the environment and to preserve natural resources [4]. As the sustainable farming methods and practices have a positive impact upon the environment, they contribute to the increase of the population's quality of life.

The modern farming practices, like contract farming, must achieve all the objectives of ensuring enough agricultural products to support food security and to boost small farmers' prosperity, but also to protect natural resources and prevent environment degradation [8]. Contract farming is considered a modality to organise commercial agricultural production of both large and small farmers. In a wide acceptance, contract farming is considered an agreement between two parties – producers on one hand and different types of buyers, on the other hand – agreeing beforehand all the conditions for the fulfilment of the contract (production, marketing etc) [6].

Contract farming has significant benefits both for farmers and buyers. However, the benefits are accompanied by a series of risks (Table 1).

Table 1. Contract farming – benefits and risks

<i>Benefits</i>	<i>Risks</i>
Farmers (producers)	
<ul style="list-style-type: none"> • easier access to inputs, services and credit, which are also provided by the buyer; • acquiring new production and management skills; • ensuring market participation and access to new markets; • reducing price-related risks; • ensuring more stable incomes; • introducing new technologies; 	<ul style="list-style-type: none"> • loss of flexibility to sell to other buyers; • possible delays in payments and supply of inputs; • debt risk due to loans provided by buyer; • environmental problems – due to the cultivation of only one type of crop; • unequal bargaining power between farmer and buyer; • increasing farmer dependency and vulnerability if buyers are not trustworthy;
Buyers	
<ul style="list-style-type: none"> • good supply of raw material; • providing conform products that comply with quality and food safety standards; • reducing labour and input costs compared to integrated production on the land owned by the company; • better opportunity to ensure products of consistent quality; • overcoming land constraints; • reliability of purchased production compared to purchases on the free market. 	<ul style="list-style-type: none"> • high transaction costs of contracts with small farmers; • risk of farmers selling to other buyers violating contractual provisions; • misuse of supplied inputs; • farmers use seeds and fertilisers supplied by the buyer for other purposes; • loss of flexibility to seek other sources of supply; • reputational risk if things go wrong.

Source: <https://www.fao.org/in-action/contract-farming/background/what-is-contract-farming/en/> [7].

In a period of market liberalisation, globalisation and expansion of agribusiness, small farmers may find it difficult to participate actively in the market economy. Several studies indicated that contract farming represents an important step on the way to modern agriculture and significantly improves the living conditions of many small farmers around the world [5]. Some specialists consider that contract farming represents a way of responding to a series of issues that are capping farmers' productivity and incomes in emerging economies, including financing difficulties, limited knowledge regarding production methods, and market related aspects. In that respect, farming activities based on contract can help agricultural producers to shift from subsistence production, with low-value crops, to commercial production with high value crops, facilitating their access to national economy and increasing their incomes [11], [5]. Contract farming enables small farmers to surpass different barriers and to extend their sales area to national and international levels;

also, it can support a higher production, incomes level and improves food security for the population [12].

Although a rich literature exists on the economic impact of farming based on contract, when it comes to the impact on the environment by adopting sustainable practices, there is a considerably lower number of studies: the environmental effects of farming based on contract has received little attention so far [9], [16]. There are studies addressing concerns over environmental degradation and overuse of natural resources attributed to this type of farming, pointing out that it could have adverse effects on durable land management [1]. Nevertheless, other studies highlight the fact that contract farming could also positively influence the adoption of sustainable practices by farmers: for instance, some find soil fertility-enhancing effects for vegetable farmers due to the application of natural fertilisers and compost [13], organic fertilisers that they have not used before concluding the contracts; the higher incomes of contract

farmers can also lead to learning to optimise the production processes [3].

Contract farming has existed for many years and there is a growing interest for this type of farming, especially in emerging economies and/or early stage liberalised ones [5].

In this context, the paper aims to study the degree of adoption of sustainable farming practices by farmers who conclude contracts as compared to farmers who operate on no contract basis.

MATERIALS AND METHODS

This paper is based on a field survey that was conducted in the Dornelor Basin in Suceava county. Data was collected from 52 farmers who raise dairy cows, using a questionnaire with dedicated questions. Data obtained from respondents were registered and processed using the SPSS software.

Out of total 52 farmers investigated, 90.4% (47 farmers) concluded a contract to sell their production. Most farmers (84.6%) opted to conclude an individual contract on independent basis (44 farms) and only 5.8% (3 farms) opted for a collective framework contract.

Contract production is a significant element of the agricultural business, depending on the type of buyer: small or large companies, agricultural cooperatives, public agencies or individuals/entrepreneurs.

RESULTS AND DISCUSSIONS

The obtained results reveal that contract farmers adopt sustainable agricultural practices to a lesser extent compared to non-contract farmers. The paper provides new insights into the characteristics of contract farming and starting points for future research work on the functions of agriculture related to food production and environmental protection.

General characteristics of farms and farmers: the figures in Table 2 highlight evident differences as regards age, gender, education, experience in farming and farm size between contract farmers and non-contract farmers. Briefly, the analysed values reveal that there

are differences between farmers who operate on contract basis and those who sell freely on the market or produce for self-consumption.

Compared to non-contract farmers, contract farmers tend to hold a larger productive base (including livestock and agricultural area), to rely on modern technology and inputs and to engage in trading with wholesalers and/or with processors.

Table 2. Descriptive statistics – general variables

Variables	Contract farming	Non-contract farming
Average age of farmers (years)	50	53
Gender (%)	M-70.2% F-29.8%	M-80% F-20%
Education (%)	Gymnasium - 21.7% High school - 32.6% Tertiary - 41.3%	Gymnasium- 20% High school- 40% Tertiary - 40%
Average number of agricultural experience (years)	27	24
Average farm size (ha)	13.2	10.3
Number of animals (LSU/farm)	10.9	7.4

Source: own processing based on [10].

As shown in Table 2, both the farm size and the number of animals, expressed in conventional units, are larger in the case of contract farmers. However, there are studies that show that the presence of contrasting results can be, in part, justified by the type of product: in Indonesia, for instance, contract seed producers were, in general, over average as size, whereas contract poultry producers were below average [14].

As regards the characteristics of farmers, it can be noticed that contract farmers are younger, have a better professional training and more experience in agriculture.

Attributes of contracts: For the valorisation of cow milk production, 97.9% of farmers from the Dornelor Basin who have concluded a contract prefer a processing company as partner, while only 2.1% prefer an agricultural cooperative as partner (Table 3).

Table 3. Types of contractors/buyers

Contractor	Number of farms	Share (%)
Farmer association	0	0
Agricultural cooperatives	1	2.1
Processing company	46	97.9
Retailer	0	0
Other situations	0	0
Total	47	100

Source: own processing based on [10].

The prevalence of contract farming differs significantly by product: milk production is, generally, convened based on contract by a processor that organizes the provision of this product, that is highly subject to spoiling. Worldwide, the dairy sector relies on private processors that have replaced the cooperatives that used to collect milk [2]. This situation is also found in Dornelor Basin: to sell cow milk production, most contract farms prefer a (private) processing company as partner. Out of total 47 farmers who have concluded a contract for the sale of their production, 38 (80.9%) declared that they had a fixed duration of contract. Most of these (86.8%) concluded contracts with a maximum duration of 1 year (Table 4).

Table 4. Duration of the contract

Length of contract	Number of farms	Share
One year or less than one year	33	86.8
Several years	5	13.2
Total	38	100.0

Source: own processing based on [10].

From the analysis of collected data, it can be seen that the intensity of contractual agreement can fall into one of these categories (Table 5):

- i) market terms:* the parties (producer and buyer) consent regarding the contract's terms;
- ii) resource terms:* the buyer assists the producer with technological support, different inputs and marketing arrangements;
- iii) management standards:* the producer (farmer) follows the buyer's requirements regarding the production process, types of

inputs and agricultural practices' specifications [5].

Table 5. Specifications provided in concluded contracts*

	Number of farms	Share(%)
Market provisions		
Sale in advance of next year's production on contract basis, at a guaranteed price	14	26.9
Unplanned sale of production, at the price at the time of sale	9	17.3
Regardless of the two options	29	55.8
Fixed price	25	53.2
Minimum price	3	6.4
Market price	12	25.5
Average market price	6	12.8
Fixed amount	21	44.6
Minimum amount	13	27.7
No specified amount	13	27.7
Provisions related to the use of resources		
Origin of inputs used	20	47.6
Quality of inputs used	23	54.8
Adoption of specific technologies	20	47.6
Compliance with certain working conditions	11	26.2
Compliance with certain environmental conditions	32	76.2
Management specifications		
Restrictions on the use of pesticides	27	84.4
Restrictions on the use of antibiotics	30	93.8
Conservation of soil quality	15	46.9
Conservation of biodiversity	8	25.0

*Questions with multiple answers

Source: own processing based on [10].

The majority of contracts signed with farmers from the case study area included specific management requirements restraining the use of some inputs like antibiotics and pesticides. Also, the requirements on the use of certain resources had important values: the requirements focused on the origin and quality of inputs used, adoption of specific technology, observance of restrictions targeting environmental protection. The restrictions on environmental protection have the most important share – 76.2%. The explanation may come from the fact that the study area is benefiting from certain agro-environmental schemes of CAP. Some

requirements related to quantity were present in the case of market provisions: 44.6% (21 farmers) declared that they concluded contracts for the delivery of a fixed quantity; 27.7% of contracts stipulated a minimum quantity and 27.7% did not have any stipulated quantity. More than half of concluded contracts (53.2%) provided for the sale of production at a fixed price. A significant share of farmers (25.5%) concluded contracts at the market price.

The farming system based on contract ought to be regarded as a cooperation between two parties -buyers and farmers. In order to be successful, a long-term commitment is required from both parties. In many cases, these engagements are short lived, and thus they may jeopardise investments in agribusiness. The most frequent problems that contract farming is facing are the secondary sale of production by farmers and the manipulation of quality testing by buyers. Conflicts between buyers and farmers frequently arise over prices and quality standards. In certain market conditions, for example an increase of prices, some contract farmers could be enticed not to respect the contract's terms and try to sell the products for a higher value on the market. On the other side, some contractors could, also, be enticed to temper with quality results with the purpose of reducing the price they have to pay to farmers, mainly when market prices have fallen [11].

Adopting sustainable agricultural practices:

In order to evaluate the attitude of contract versus non-contract farmers, when it comes to sustainable practices' adoption, the main agricultural practices used by dairy farmers from the study area were determined: we aimed to investigate if the selected practice enhances or decreases farm sustainability. Table 6 highlights the main agricultural practices that can be considered sustainable.

In the first place, no farmer, either contract farmer or non-contract farmer, uses chemical fertilisers, although balancing plant nutrition is important in improving productivity. This situation could be also attributed to the fact that the component administrative-territorial units of Dornelor Basin are under the

implementation of (CAP) agro-environmental measures. All farms, either contract or non-contract farms, use manure for the fertilisation of meadows. In the areas with developed manure markets, like the Dornelor Basin, usually farmers can sell and buy manure on the market. In lack of specialized markets, the main source of manure derives from farmer's own livestock. Consequently, the smaller the livestock is, the less organic fertilisers will the farm have at its disposal.

Table 6. Sustainable farming practices

	Farming practices	Contract farming	Non-contract farming
Grassland management	chemical fertiliser application	0%	0%
	manure application	100%	100%
	compost application	8.5%	0%
Dairy cow farming	LSU per ha permanent grassland	0.51	0.54
Livestock feeding	average number of months: -grazing in open air	5.6	6
	-silage feeding	5.1	7
	-hay feeding	6.4	6
	-combined feed	6.5	5.3
Disease control	use of antibiotics for treatment and prevention	17%	40% (2)
	use of antibiotics only for treatment	70.2%	80% (4)
	use of alternative remedies	0%	0%
	use of physical measures – separation of animals	34%	40% (2)
Movement of animals	local movements /around the farm	83%	100%
	seasonal movements (shepherd summer camps / grazing on mountain pastures)	44.7%	40% (2)
	specific storage facilities to reduce greenhouse gas emissions	31.9%	20%
	storage facilities to reduce leakage	55.3%	80%
	digester use	8.5%	0%
	composter use	4.3%	0%

Source: own processing based on [10].

In the Dornelor Basin, both in contract or non-contract dairy farming, dairy cows are generally raised in a traditional system, with a low animal load per surface unit. Many farmers raise a small number of animals, kept in naturally-ventilated shelters, with wooden floors and straw bedding.

Contract farmers, as compared with non-contract ones, are inclined to a higher usage of antibiotics, when it comes to treatment and

prevention. This supports the assumption that contract farmers can easier resort to medication and thus are less inclined to take up sustainable practices. Concurrently, contract farmers also resort to the method of separating ill animals to a lesser extent (34%) compared to non-contract farmers (40%).

Taking into consideration the physiology of dairy cows, feeding is based on grazing and on foodstuffs produced on the farm – hay and silage, both on contract and no-contract farms. As regards contract farms, the combined feed registered a slightly higher usage level.

CONCLUSIONS

The present-day production and commercial channels, including contract farming, that boosts farm's productivity and income level, play a key role in poverty abatement and food security, especially in emerging economies. The sustainable methods of cultivation and conservation of natural resources have become major issues in research and practice. Contract farming, simply described as an arrangement between producers and buyers (processors, marketing companies, contractors, etc.) for the supply of agricultural products based on previously concluded agreements, often at predetermined prices, is a practice that becomes increasingly important in both developed and developing countries, supported by growing consumer interest in food security and safety.

This paper used the data collected at farm level in the Dornelor Basin (Suceava county) and had as main objective to evaluate the way the contract farming influences the adoption of sustainable agricultural practices. Firstly, it seems that these farmers, in general, are younger and more experienced as regards agricultural activities, hold larger farms in terms of size, but also have more livestock – in comparison with non-contract farmers. Secondly, the obtained results indicate a significant link between contract farming and the intensity of sustainable agricultural practices: there is a lower level of adoption of sustainable practices in the case of contract farmers

The analysis also pointed out that contract farming could represent a support instrument for farmers willing to uptake more sustainable practices. Also, it supported the idea that contracting ought to be coupled to the acceptance of sustainable practices to ensure that farmers adopt ecological farming methods. Contractors could also commit to provide sustainable inputs and training in sustainable farming methods to farmers. The existing contracts could also be linked to certification schemes that actively promote sustainable agricultural practices.

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