

## VEGETABLE FARM INTEGRATION INTO SUPPLY CHAIN: PROBLEMS AND POSSIBILITIES

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*Abstract: The Romanian vegetable chain is characterized by uncertainty in terms of what vegetable to produce and where to sell and, it negatively impacts the farmers' revenues and investment decision. The aim of this paper is to evaluate the level of integration of fruits and vegetable farms into supply chain. The methodology used is based on new institutional economics theory and takes into consideration transaction costs, collective actions and market organization theories in order to see the level of integration of small fruits and vegetable producers. The results show an extremely small level of integration of small farms into fruits and vegetable supply chain due to several constraints such as high transaction costs, no participation in any kind of collective actions such as producers groups or different forms of cooperation/associations with commercial purposes.*

*Keywords: vegetable supply chain, integration, collective actions*

### 1. Introduction

Contrary to producers in industrialized countries receiving adequate infrastructure, with efficient institutional systems and agricultural policies that contribute to the adoption of good agricultural practices and environmental standards, producers in Romania face major problems to adapt to dynamic agri-food sector. These difficulties result from market failure that characterize vegetable sector (Swinnen and Vandeplass, 2007) and informational, financial and educational limitations which vegetable producers have to face. Romania's production of vegetables is fragmented, mostly coming from the individual households (90%) and only 10% from the legal commercial farms. The need for integrating the small vegetable farms into the agri-food supply chain is extremely important if we take into consideration the fact that the semi-subsistence vegetable farms prevail in the Romanian horticulture sector, with a high number of individual farmers but with still poor quality of educational skills in terms of marketing issues and insufficient innovative capacity regarding integration into the supply chain.

This research raises the complex questions of semi-subsistence farms integration into supply chain and the level of formal relationships between small subsistence farmers and modern retail chains through written contracts, the degree of participation in collective actions. The objectives of increasing agricultural productivity, yields and supply chain integration might be fulfilled by investing in modern irrigation system and other production inputs, but also by improving small farmers' (technical and managerial) education on the semi-subsistence farms (Toma et al, 2013), including participation in collective action.

## 2. Data and methodology

The paper is based on data provided by 600 farmers located in the S-E region of Romania following a survey conducted in this region in 2011. In total, 600 structured questionnaires were applied to farmers. Interviews were also conducted with 4 supermarkets, including 2 discounters (modern retailers which practice discounted prices) and farmers belonging to 4 producers groups. Among the investigated farmers, 34% of farmers cultivated vegetables on less than 1 ha, 51% of farmers cultivated vegetable for commercialization on areas of 1-5 ha, and 5% of farmers cultivated vegetables on areas between 10 and 50 ha. Due to space limitations, information on questionnaires and more details on the method are available upon request from the author. The sampling method was a random sample carried out in a traditional vegetable area where farmers have a commercial behaviour. Regarding the interviews with the representatives of supermarkets chains, these were chosen randomly based on their willingness to answer to my questionnaire. The 4 producers groups were chosen from a list of 22 producers group who were located in the investigated area. The analysis is both qualitative and quantitative. The analysis is also complemented with figures and findings at national level based on author's previous researches (including interviews with representatives of retail chains and producers groups (Alboiu, 2013).

## 3. Results and discussion

The investigated sample was extracted from a number of 600 farmers from Dâmbovită County who accessed. It has become a fact that the agricultural sector in Romania faces major problems mainly related to poor organization of farmers to marketing production and a slow adaptation to the requirements of modern retail chains. Indeed, no supermarket buys from a small farm as it requires large volumes of production of consistent quality. A large, consistent production can be obtained only if exists a modern and functional market infrastructure - collection points, greenhouses, warehouses, logistics and packing systems. All these investment means exceed most often the financial capacity of a single farmer, even medium size, to supply a modern retail chain.

At the same time 77% of consumers from urban areas do their shopping in modern supply chains. The market share of modern retail chains has significantly increased in last years, representing almost half of the total en detail sells per total population. At present, in Romania 42% of grocery sales are made through modern retail chains out of which 26% is represented by hypermarkets, 9% supermarkets and 8% discounting stores. At the same time, in the recent years an increase of consumers' appetite for doing shopping in modern retailers has been noticed, i.e. 70% of consumers in the urban areas.

This research raises the complex issue of semi-subsistence farms integration into supply chain and the formalization relationships between small farmers and supermarkets through written contracts. The figures at national level show a low level of written contracts,

the relationships being complicated by non ethical practices coming from retail chains and producers incapacity to meet supermarkets requirements.

On the other hand, the agricultural sector faces problems mainly marked by poor organization of farmers to marketing their production and slow structuring of their commercial behaviour. In the cereal sector, for example, out of a total production of 12,698 tons in 2012, only 10% is contracted according to the industry. In the milk and dairy sector, out of a total production of 5.4 million hl, only about 22% is contracted. In the fruit and vegetable sector, from a production of 3.5 million tonnes approximately 20% is sold on the basis of written contracts either to large retail chains or to processors.

This basically leads to an imbalance of the bargaining power of farmers and their trading partners and to an inequity in terms of market power – the downstream sector is concentrated while the producers fail to organize. To this imbalance other issues can be added such as:

- uneven taxation according to the legal status of the producer;
- unfair competition sometimes manifested by uncontrolled imports in terms of fair veterinary controls and tax evasion;
- lack of clear facilities for various forms of associative organization ;
- insufficient promotion of measures regarding farmers organization (the European funds dedicated to measure 142 "Setting up of producer groups" were absorbed in a rate of about 30 % in May 2013).

Technically, the main reasons for which the contract is seen as a tool to improve trade relationships is the increasing efficiency of marketing channels (boosting profits for farmers as a result of increased productivity, improved technology transfer, better coordination), improved decisions on production planning and investments of farmers, increasing vertical integration, better response/meet to consumer requirements - food safety, animal welfare, environmental protection - increasing transparency on supply chain risk sharing.

While there are plenty of reasons and benefits for which the contracting seems to be necessary and useful, there are still some constraints which, so far, farmers fail to cope with:

- Quantity and quality requirements, frequency of deliveries
- Contract duration
- Privacy policy and exclusivity.
- Several issues were raised systematically by farmers and their representatives in the research interviews:

1. High **transaction costs** incurred by both sides

For the farmers is complicated to find a client but also to monitor the compliance with contractual terms. For large retail chains, processors and discounters is costly to sign contracts with a large number of producers (supply atomization).

2. High degree of risk and uncertainty in agriculture.

Large variations in climate conditions have direct consequences on the production constancy and therefore on price volatility. Price volatility and the need for immediate liquidity bring farmers in the position to sell outside the contract. In addition, demand for agricultural products has an ongoing character, while the supply is seasonal. This feature leads

to increased variation in prices, and the vegetables and fruits chain becomes very problematic given that the number of warehouses is insufficient.

4. Unfair competition from imports insufficiently checked in terms of quality, sanitary and veterinary issues and tax /accounting control.

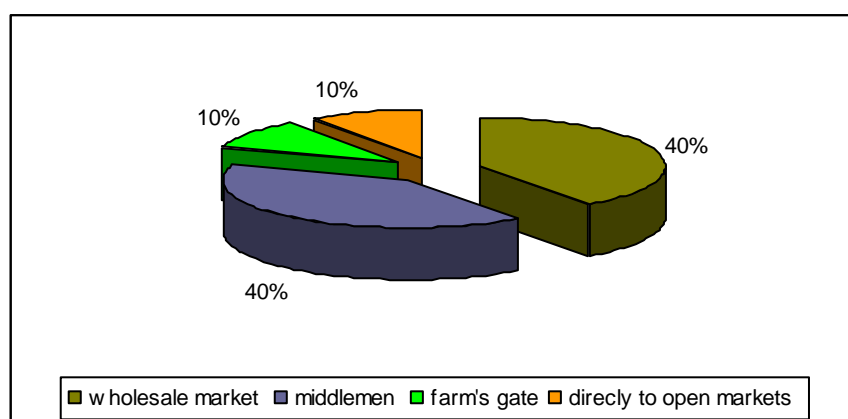
The situation is serious, especially in the case of products imported from extra EU countries, being questioned aspects related to the compliance with quality and food safety requirements and also compliance with customs import procedures including verification of an accounting document. Most of the interviewed farmers said, these imports come when the Romanian production appears on the market to compete and reduce price, which reduces the farmers incentive to contract. Farmers argue that massive imports and the preference of retail chains for imported production, especially during the season when Romanian producers can supply the necessary consumption negatively impact their access to modern retail formats. The figures are eloquent in this regard. According to the National Institute of Statistics, last year Romania imported about 900,000 tonnes of fruit and vegetables, worth about 400 million euros. "It would help a lot if imports were not so high as long as there is domestic production and retail chains would allow farmers entry into these modern retail formats" (farmer, Dambovita).

In addition to the high standards on quantity, quality, delivery schedule, food safety measures and contractual penalties imposed by modern retail sector, it seems that a major barrier of the interviewed farmers to access large retail chains is the cost. For various marketing and promotion activities carried out by retail chains, costs can reach up to 35-50% of the product value.

#### **Vegetables supply chain: the relationship producers – retail chains - processors**

To evaluate the characteristics of contractual vegetable supply chain we rely not only on interviews with the 600 farmers but also on several case studies and interviews with representatives of major vegetable producers and processors chains. Fruits and vegetable production sale is the most difficult problem because are not respected institutional guidelines on the operation of specific market meant for trading these products. Generally, vegetable sale is made directly or through intermediaries. About 40% of interviewed farmers sells in wholesale markets, 50% sells through middlemen, 9% directly from the farm). Another part of the production is destined to retail chains and processing, generally when the farmer has a written contract, that means less than 1% (figure 1). Only 6 farmers out of 600 were able to sign contracts with supermarkets. No formal written contracts were concluded with shops and supermarkets of smaller magnitude such as discounters. Similar situation is valid also for hypermarkets. It should be emphasized that among those who were able to signed contract were farmers with higher education.

Figure 1: Sale of fruits and vegetable for the beneficiaries of Measure 141 in Dambovita County



Source: own calculations based on a sample beneficiaries of Measure 141 from Dambovitva County

With regard to the products sale on the different marketing channels at **national level**, it cannot be made an accurate quantification of the volume that is sold through each of these channels. The information available can only indicate some estimates. According to the representatives of the industry it could be estimated that more than half of the fruits and vegetables are sold to a large number of intermediaries.

Regarding hypermarkets, at national level, very few farmers can sell their products through this channel. **It is estimated that less than 20% of vegetables are sold in this way.** In the case the vegetable transaction is not made directly through these types of stores, the sale is done through long distribution channels such as producer groups, associations, wholesalers who in turn sell to large retail chains. Modern retail formats require quality products in large quantities with a well established frequency. Another part of the production is destined for processing in general if the farmer has a written contract with the processing company.

***Tabel 1: The frequency of formal contractual relationships***

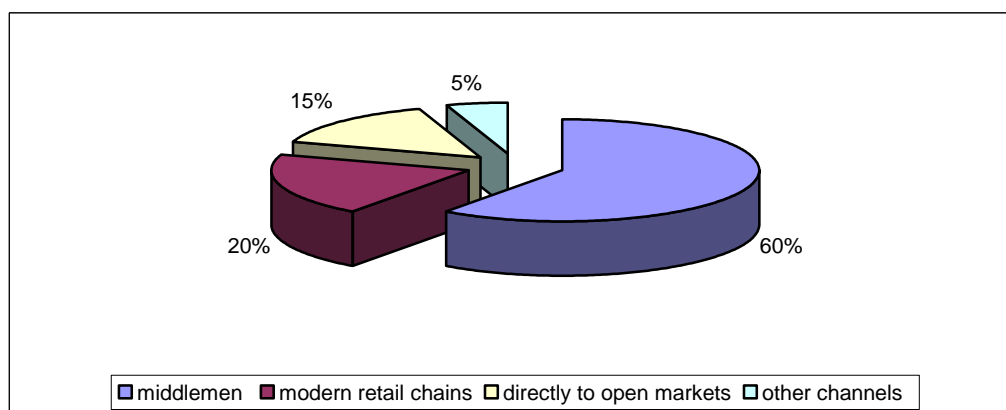
	Farmer - middlemen	Farmer - processor	Farmer- retailer	Processor - retailer
Formal relationships (number)	60/600	6/600	8/600	2/7
% of number	10%	0.8%	1.33%	28%

*Source: Survey, M141 beneficiaries, Dambovitva County, 2013*

Following the interview survey, one might conclude that the frequency of written commercial relationship is extremely low for all four stages of the supply chain. The results show that the share of formal relationship is very low at the farmer - intermediate and the farmer-processor. A higher percentage of formal trade relationship is observed in the processor – retailer level. Formal relationships include formal written contracts and specific financial covenants such as price, quality, quantity, contractual penalties or other financial support. The retail stores tend to choose more formal contractual relationships with processors

than directly with farmers, which suggests a better coordination and a more systematic and standardized organization in the vegetables downstream chain. At national level, representatives of industry interviewed for this research study said that nationally, vegetables are marketed primarily through intermediaries (60%), directly on the market (20%), modern retail chains (15%), and other channels (5%). The main marketing channels of vegetables are presented in the following figure:

**Figure 2: The main selling channels for vegetables at national level**



*Source: own estimations based on discussions with representaives of vegetable supply chain*

Sale in vegetable sector is highly fragmented. Case studies conducted at national level reveal that producer groups consist largely of individual producers and one or more farms with legal status. Case studies and interviews held with representatives of producers shows that the trend is that the number of individual producers shrink, increasing the share of farms with legal status. The representative of producer groups appreciate that are not sufficiently supported, that do not receive subsidies at the right time but the main problem they face remains production selling.

However, the interviews with the 600 semi-subsistence farmers showed no farmer to take part in any collective actions with the purpose to commonly collect and sell the production. In other words, the questionnaires applied to the 600 farmers reveal almost no integration into supply chain, no participation in collective actions and a strong continuation of informal relationship with intermediaries.

Concerning the collective actions at national level, up to present in the fruit and vegetable sector there are only 34 producer groups and 3 producer organizations. Initially, in 2008 there were 54 producer groups preliminary recognized. But some licenses have been withdrawn in 2011 due to fail to comply with the requirements regarding the obligation of selling 75% of the member's production through producers groups, remaining only 34 groups in present. As already, said, among the 600 farmers interviewed in Dambovita County none of them were member in a producer group. According to interviews conducted with representatives of the retail chains, the vegetables procurement is generally organized in the department that deals with the procurement of fruits and vegetables based on written contracts with local suppliers (mainly large vegetable farms, with legal status and producer groups).



In general, representatives of the major retail chain stated that they prefer to buy vegetables and fruits from large commercial farms, with legal status, however when this is not possible, they obtain their supplies from small producers of vegetables through a specialized intermediary. Representatives of producers groups have signalled out very many limits targeting the supply of small producers of vegetables towards modern retail chains. Firstly, the fruits and vegetable procurement mechanism varies from one retailer to another. Modern retail chains usually pay out three weeks or even a month after the delivery of production, which is an important issue for small semi-subsistence farmers who do not have the cash to cover this period. Secondly, to sale their production through modern retail chains Romanian vegetable producers have to pay an entrance fee so-called “shelf fee“ that is up to 15%, which is considered extremely high for their financial power. For example, "the shelf fee" can vary between 10 and 15% of the price the farmer receives if the farmer sells production through modern formats. This makes the price received by the farmer belonging to the producers group to be lower than the price obtained by selling production through traditional marketing channels (intermediaries), the only advantage being given by the economy of scale that ensure guaranteed sales in case of delivery of large quantities. The same statement was made also by the 600 interviewed in Dambovită County, saying that for them individually would be impossible to pay the self fee. Contracts breaching and poor enforcement of contracts is one of the major problems that fruits and vegetables producers have to face within supply chain.

Actually, small farmers for instance prefer oral contracts because the prices they get are higher and the payment modality is more convenient, usually cash at transaction's moment. At the same time, for example, when a price is fixed in the contract, an increase in market prices will increase the benefits for the producer to sell the product on the market (outside of the contract), and vice versa.

Branch organizations and trade unions recognize that it is very difficult for small producers to market fruits and vegetable production through large retail chains because they fail to provide sufficient quantities. They consider that "shelf fee" required to local vegetables producers is very high, making it difficult the access of the producer groups to the modern retail chains and impossible for small producers including the semi-subsistence farmers.

Although among interviewed farmers, no producers group could be found, it should be emphasized the role of producer groups to connect farmers to markets, by providing assistance schemes such as providing consulting services, storage facilities, provision of agricultural inputs and establish formal contracts between farmers and modern marketing retailers. Case studies carried out at national level with the occasion of other research studies, reveal that due to vegetables price volatility it may happen that small producers violate the agreement they have with the producer group. This attitude prevents proper operation of the producer group, and as a consequence, the group no longer manages to sell 75% of its members' production through the group and the development plan initiated within Operational Programme can no longer comply with the project requirements.

Opportunistic behaviour of some farmers to sell outside the contract within the producer group is accentuated by the price volatility, high VAT tax, shelf fees and other costs incurred with the authorization of the group. In the absence of special tax breaks producer groups will continue to be undermined by its own members who seek easy ways to win immediately. At the same time, similar costs make almost impossible for the 600 interviewed farmers to dare to think that they could sell their production through modern retail chains unless they will not be able to form producers groups or at least informally to manage to collect their productions. Although 80% of interviewed farmers recognized that they would like to become a member into a Producer Group and recognized the importance of collective actions to improve their economic situation; however, a simple exercise among these small subsistence farmers from Dambovita County concerning their willingness to form a producer group showed major difficulties related to lack of trust, initiative and enthusiasm to assume a different commercial perspective.

## 5. Conclusion

The main results may signal out that there is a certain degree of farmers' participation in collective actions. Nevertheless, at the country level the number of participation in collective actions is extremely reduced. Marketing and collection and distribution center support offered by organizations have the specific objective to insert small farmers into the retail chain.

At the same time, it could not be found any incentive of participation in collective action meant to help farmers to better sell their products especially in modern retail chains. The interviews with farmers showed that obtaining the certificate that proves that a farmer is part of an agricultural association is only an extra administrative burden without any kind of help from the association's side at least from the commonly production selling perspective or integration into supply chain.

At the same time, the qualitative results suggest that organization itself is not enough to facilitate the participation in the retail chains and many free riding problems occur. The qualitative results reveal that in Romania's case there is a high degree of uncertainty among stakeholders both in terms of institutional arrangements and participation in collective actions. The share of participation in collective actions is higher in case the institutional arrangement is initiated by a larger farm. The results of qualitative research at national level show a small degree of written contractual relationships, poor contract enforcement because the market is not functional. Also, the interviews with representatives of retails chains show that it is impossible for them to contract with small farmers because of high transaction costs on both sides. The level of organization is extremely low; i.d. less than 1% while in the EU represents 36 %, due to lack of willingness to cooperate and trust but also a lack of understanding of measure's guideline regarding setting up producers groups. At the same time small farmers cannot provide large quantities of a certain quality and frequency and this leads to higher costs of inputs because small farmers fail to organize themselves in different forms of collective actions which would allow them to have economies of scales. While competition at



the retail stage stimulate changes in formats of retailing and outlets, the tendency to concentration and consolidation also in upstream stages of supply chains creates a bias against small farms and supports forms of association at farm level stage.

This is the major challenge for small vegetable farmers, either from the EU or other supplying areas: how to be part of modern EU-based chains where the retail stage coordinates the other actors (Dell'Aquila et al., 2011). In the recent years, emerging causes of instability (market price volatility, overproduction in certain sector, increasing costs of production, stagnating consumptions, growing fruit and vegetable imports as effect of bilateral/multilateral accords) add to structural and established weaknesses (sector fragmentation, and its weak bargaining power, versus retail concentration and agro-food industry competition), further exacerbating the tense relationship in the fruit and vegetable supply chain (Dell'Aquila et al., 2011). Also, the requirements coming from retail chains have steadily increased.

Following the EU integration, the vegetable supply chain in Romania seems the most negatively affected sector, due to the high share of imports and the farmers' impossibility or incapacity to maintain stable contractual relationship within the chain. In addition, the results of this research show that the beneficiaries of Measure 141 were not able to enter or form producers' groups or participate in other type of collective actions either because of lack of trust or willingness to cooperate. Also, the National Rural Development Program reveals an extremely low absorption of funds for the measure aimed at setting up producers group as well as an extremely small number of applicants.

### References

1. Agrosynergie. *Évaluation des mesures concernant les organisations de producteurs dans le secteur des fruits et légumes, Rapport final, Contract cadre n° 30- CE-0159637/00-04, Novembre, 2008*
2. Alboiu C. (2012), "Governance and contractual structure in the vegetable supply chain in Romania", in Romanian Journal of Economic Forecasting, type A, 10/2012, pag. 68-82, ISSN 1993-6788
3. Dell'Aquila, C., Petriccione, G., Perito, M. *The EU vegetable and fruit sector: overview and post 2013 CAP perspective study, Directorate General for internal policies, Policy Department B: Structural and Cohesion Policies, Agriculture and Rural Development, [www.europarl.europa.eu/studies](http://www.europarl.europa.eu/studies), 2011*
4. Dries L., Swinnen J.F.M., Reardon T., 2004. The Rapid Rise of Supermarkets in Central and Eastern Europe: Implications for the Agrifood Sector and Rural Development, Development Policy Review, 22 (5): 525-556
5. Reardon, T., Barrett, C.B., Berdegue, J.A., Swinnen, J.F.M., 2009. Agrifood Industry Transformation and Small Farmers in Developing Countries World Development 37, 1717-1727
6. Swinnen and Vandeplass, 2007, Contracting, Competition and Rent Distribution in Commodity Value Chains, Proceedings of the FAO Workshop on Governance, Coordination and Distribution along Commodity Value Chain

7. Toma C., Turtoi C., Gavrilesu C., (2013) A Socio-Professional Analysis of the Semi-Subsistence Farms Managers in Dâmbovita County, Bulletin UASVM Horticulture, Romania, 70(2), pag, 382-389, Print ISSN 1843-5254; Electronic ISSN 1843-5394