

DIAGNOSIS OF THE AGRI-FOOD VALUE CHAINS IN THE REPUBLIC OF MOLDOVA

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Abstract

The main aim of the paper is to present the state of the agro-food value chain in the Republic of Moldova in conditions of incomplete information and uncertainty. In order to accomplish this general scope, the methodological approaches were adjusted to the available scarce data and existing research resources. Three important outputs are foreseen as a result of the investigation: description of the current situation of the components of agri-food value chains and interaction among them; the rapid analysis of the main dimensions of the chain; identification of constraints and development opportunities. Performance of the agro-food value chains in the Republic of Moldova is affected by high energy costs, unstable sources of inputs supply, restricted access to end-markets. It is also necessary to improve the investment climate in order to modernize the agri-food chains.

Key words: *agri-food value chains, added value, vertical integration*

INTRODUCTION

The transformation and modernization of the world agri-food sector has met different challenges over time. Countries with transitional economies have been experienced a complex processes of transforming their political and economic systems. In case of the Republic of Moldova the results of the reforms have not yet met original expectations.

The challenge for the Moldovan agri-food sector is to identify specific agricultural and rural development needs and opportunities across the value chains, and to focus investment in areas where the greatest impact will be achieved. This identification and resource allocation process can be facilitated by analyzing the main dimensions of value chains in order to develop an understanding of local factors and linkages. [3, 5, 10]

The most important effect of an agri-value chain derives from a series of activities that add value to a final product, beginning with production, then processing, transforming into final product, and marketing, sale to the end user or consumer and disposal after use. In conditions of small transitional economies value chain diagnosis as a rule is based on scarce data and incomplete information. Specific methods and techniques were used to investigate the real status of different dimensions of value chains.

MATERIAL AND METHODS

The scientific discussion about the vertical integration of production and distribution processes lasts more than 50 years. Thirty-two manuals and guidelines for value chain analysis were identified [5]. The most common became methods for the rapid appraisal of the value chain.

In the Republic of Moldova the agriculture is decomposed into a series of sectors and value chains which together form an “industry system” comprised of a series of inter-related sub-systems. The sub-systems and the relationships between them are examined through a diverse set of analytical tools, thus forming a multi-disciplinary and integrated study. The main objectives of this research are to evaluate the supply chain and trends in the agri-food sector in the Republic of Moldova and to determine the driving forces behind these changes (demand side, supply side, policies, and institutions). To identify previous insights useful in addressing the study objectives, the literature review was focused on relevant studies in the domains of rural development, the development of markets, agribusiness, agricultural systems and change in agri-food value chains.

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A number of discussions on value chains modernization have taken place within the working groups organized by the Ministry of Agriculture and Food Industry. They were based on qualitative and quantitative analysis provided by the participants.

RESULTS AND DISCUSSIONS

The value chain concept is a systems approach that evolved over time drawing from different disciplines. The scientific discussion about the vertical integration of production and distribution processes started in the 1960s. [5]

These concepts vary mainly in their focus on specific products or target markets, in the activity that is emphasized, and in the way in which they have been applied. Nevertheless, the different value chain concepts tend to identify opportunities for and constraints against increasing productivity.

A common definition presents the value chain as a mechanism that allows producers, processors, and traders—separated by time and space—to gradually add value to products and services as they pass from one link in the chain to the next until reaching the final consumer (domestic or global). Main actors in a value chain are firms from the private sector. The private sector draws from a range of public services and private technical, business and financial service providers. They also depend on the national and global legislative context and socio-political environment. In a value chain the various business activities in the different segments become connected and to some degree coordinated. [3]

By contrast, the term “supply chain” is used internationally to encompass every logistical and procedural activity involved in producing and delivering a final product or service, “from the supplier’s supplier to the customer’s customer”. Since the primary focus of supply chains is efficiency, the main objectives are usually to reduce “friction” (for example, delays, blockages, or imbalances), reduce outages or overstocks, lower transaction costs, and improve fulfilment and customer satisfaction.

Another related concept is the Francophone *filière* (literally “thread” in English). “*Filière*” is used to describe the flow of physical inputs and services in the production of a final product, and is essentially similar to the modern value chain concept in its emphasis on vertical and horizontal coordination. The framework paid special attention to how local production systems are linked to processing industry, trade, export and final consumption. [5]

The specific feature of ‘*filière*’ analysis was a static character, reflecting relations at a certain point in time. The concept is often used as synonymous to commodity chain or subsector.

As it was mentioned, there are many ways to analyze a value chain. The modern approach of value chain diagnosis represents a method for understanding how firms under given framework conditions operate and coordinate their businesses to ensure that primary materials are transformed, stored, transported and reach end-consumers in certain form and quality. Value chain diagnostics looks at the existing constraints and opportunities to value chain development, which are multiple by nature. It also looks at the various effects that operations in the chain have on groups of people, e.g., with regard to poverty reduction, employment, income generation, firm development, economic growth, or environmental sustainability. [3]

Favourable climate and high quality soils historically have determined Moldova’s agricultural specialization, particularly in the production of high value crops like fruits and vegetables. The status of the agricultural sector has changed dramatically over the last two decades, principally related to the disruption of production and distribution networks.

Land areas used for high value crops have been reduced by half. The shift in production has also been accompanied by significant reductions in land productivity.

Currently, Moldova remains dependent on its agricultural sector, which contributes with almost 12% to the GDP. Over 31% of the active population of the country is engaged in agriculture and food sector. Agriculture is divided into two distinct sectors: commercial agriculture and

subsistence agriculture. The overwhelming majority of the farmers work within non-commercial small and medium farms.

Table 1. Number of agricultural holdings, 2007-2011

	2007	2008	2009	2010	2011	2011/2007, %
Agricultural cooperatives	239	259	283	233	232	97,1
Joint stock companies	116	109	108	170	161	138,8
Limited liability companies	1342	1344	1513	2038	3624	270,0
Farms (thousands)	390,4	386,2	380,9	399,8	391,7	100,3
<i>Including with the area of</i>						
more than 100 ha	186	209	203	276	559	3 times
from 50 to 100 ha	105	113	143	524	780	7,4 times
from 10 to 50 ha	746	904	1126	1794	2729	3,7 times
from 5 to 10 ha	3307	4156	4320	3958	4175	126,2
from 1 to 5 ha (thousands)	239,5	216,1	223,5	240,8	239,9	100,2
Up to 1 ha (thousands)	146,5	164,7	151,6	145,5	143,5	97,9

Source: Developed by the author based on Land Cadastre data

The overall added value to the agricultural raw material is very low. Moldovan agricultural production and export are specialized mostly in raw material and semi processed agri-food products. Thus reported to each lei of primary agricultural production have been produced only 0,7 lei of food products in the year 2009, that is comparable with the level of the 90th. And this ratio is steady decreasing during the recent years that means stagnation in the large scale food industry.

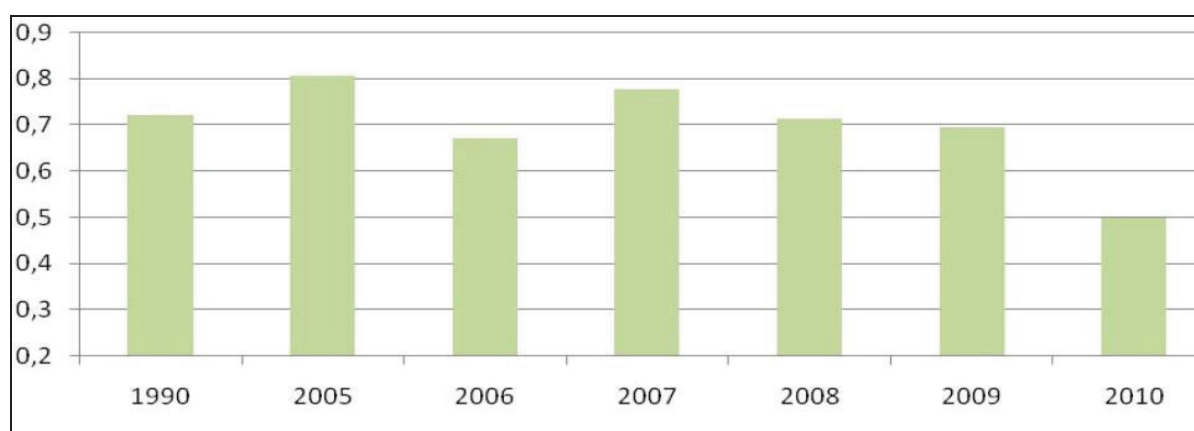


Figure 1. Ratio between the production of agri-food industry and total agricultural production, 1990-2010

Nevertheless, the food industry has maintained its importance. Thus food processing and beverage industry contributes with almost 33% of the total industry production in the year 2010. At present in this sector activates several hundreds of companies and specialized units. The most important companies are concentrated in domains of vine production, fruit and vegetables processing, meat production and processing, mills and bakeries, and dairy production.

Wine and brandy production. Wine and distilled spirits represent the largest portion of Moldova's food processing and a significant part of all industrial output. Moldova has 130 enterprises dealing with wine production and bottling. In addition there are 7 brandy factories producing, maturing and bottling distillates. About 70,000 individuals, mostly smallholder farmers, grow grapes. More than 6,000 workers are engaged in wine processing that is almost twice less than in the year 2005.

Mills and bakeries. A number of 293 mills and 311 bakeries activates in the country. They employ 1.2 thousand and 7.0 thousands persons respectively. Nowadays in the sub-sector of mills and bakeries can be observed a concentration of producers, grouped around the large bread-baking plants that have a market share of about 65% from one side and the group of small and medium scale bakeries that have a market share of circa 35%. As main leaders in this sub sector can be mentioned Franzeluta SA located in the capital city, the bread baking plant from Balti in the North region and the bread baking plant CahulPan SA in the South.

Fruit and vegetable processing. Fruit and vegetable processors are divided into two main groups: the first comprise a small number of large firms, focused on export markets and producing about 80 percent of the total output of the sub-sector; and almost one hundred of small and medium canneries mainly serving the domestic marketplace. Together these firms process from 150,000 to 200,000 tons of raw material, mainly apples and plums. Main products are concentrated apple juice, fruit and tomato paste, canned fruits and vegetables. However, the potential of the fruit and vegetable processing industry is used at only one third of its capacity.

Meat processing. Moldova's meat-processing industry is highly consolidated, while official statistical data indicate there were 195 meat processing enterprises and production units in the year 2010. "Carmez" in Chisinau and "Basarabia Nord" in Balti dominate the domestic and export markets. A handful of small and medium scale manufacturers supply sausage and smoked meats to supermarkets, while other meat processors deliver their products to small shop outlets in cities and villages.

The production of the meat processing industry is exported mainly to CIS states, particularly because Moldova has not qualified for the status needed to export meat products to the EU.

Dairy production. The dairy industry is based primarily on the supply of raw milk from small producers from company-owned collection centres and from dairy cooperatives with collection centres financed by the dairy companies or through donor programs. While overall milk supply is adequate and animal productivity has been increasing slowly, dairy processors have seen only marginal improvements in the quality of milk.

Foreign investment in the sector has been relatively strong in past years due to the potential for import substitution, but these investors are beginning to question the viability of the sector's dependence on the household milk production.

Table 2 Total numbers of enterprises and average annual number of staff employed, in the food processing industry, 2005-2010

	2005	2006	2007	2008	2009	2010
Manufacture of wine						
Number of enterprises	174	166	159	136	132	130
Employees, thou pers.	13.4	10.5	7.8	7.4	6.2	6.1
Mills						
Number of enterprises	319	326	320	295	301	293
Employees, thou pers.	1.6	1.6	1.4	1.3	1.2	1.2
Bakeries						
Number of enterprises	295	296	297	285	306	311
Employees, thou pers.	6.8	6.8	6.9	7.1	6.9	7.0
Fruit and vegetable processing						
Number of enterprises	110	113	101	94	105	106
Employees, thou pers.	5.1	5.0	4.5	4.3	3.1	3.2
Meat processing industry						
Number of enterprises	178	179	177	182	189	195
Employees, thou pers.	2.4	2.5	2.9	3.0	3.0	3.3
Dairy industry						
Number of enterprises	56	54	47	47	51	46
Employees, thou pers.	2.9	2.9	2.9	2.7	2.4	2.6

Source: National Bureau of Statistics of the Republic of Moldova, 2011

The industrial facilities supply dairy products that require quick consumption (pasteurized milk) and low storage space (sour cream, yogurt, curds, soft cheeses). However, the bulk of the population is served by dairy products produced in small household operations in rural areas for local consumption. Thus the utilization rate of existing large scale plant capacity is very low.

Furthermore food business operators, specialized in dairy production, currently are not in a position to ensure that potential exports to the EU fulfil the relevant EU requirements.

In the Republic of Moldova vertical coordination among primary agricultural production, food processing and trade, had undergone dramatic changes in the midst of 90th. Rapid liberalization of prices and external trade, privatization of farms and enterprises without relevant institutional framework, caused the collapse of vertical coordination within the existing food value chains.

In a short time, the new system of vertical integration had started to develop in the agri-food sector. The process was led mostly by food business operators and traders. At the first stage the pace of new structure's development was very slow. In order to enhance drivers, of value chains creation, the Law on organization and functioning of agricultural and agri-food markets had been elaborated and approved by the Parliament on July 27, 2006.

This law establishes the legal framework for the organization of agricultural and agri-food markets by individuals and legal entities that produce, store, process and / or sell these products at the national or international level.

Regulation of agricultural markets and agri-food ensure mainly the following objectives:

- the organization and functioning of agricultural and agri-food markets on competitive effective and stable principles;
- cover of the domestic consumption and reduce the trade deficit;
- ensuring the quality and safety of food products;
- increasing income from farming and agri-food activities;
- the sustainable growth of economic performance and competitiveness of the agriculture and food industry;
- increasing exports of agricultural products.

An important provision of the present law represents the existence of the Council on product chain - a body established by participation of partners from the product chain and representatives of public authority. [4]

The activity of the Councils on products was focused mostly on interventions rather than on the broader and more comprehensive commodity chain development. Due to this, the impact of the law on vertical integration promotion was insignificant. The further intervention of the Government was needed to improve the value chain efficiency.

The following challenges and constraints are affecting the value chain development in the agri-food sector in the Republic of Moldova:

Low productivity. Cultivation methods among peasant farms and household plots remain traditional, with low levels of mechanization and low productivity. The agricultural sector is heavily dependent on rain-fed cultivation. Inefficient agricultural systems, weak market structure, small land holding sizes determine insufficient potential for sustainable delivery of primary agricultural commodities within the value chain. The absence of more productive agricultural technologies has resulted in land degradation due to continuous cultivation, soil erosion, deforestation and limited technology adaptation to changing climate.

Food processing. At present in the food processing and beverage industry activates several hundreds of companies and specialized units. Most of them are concentrated in urban areas. Small-scale food processing emerges in rural localities but it remains rather limited. Many large factories were built using industrial designs from the 1940s and 1950s and consequently have outdated processing and packaging lines. The equipment is not energy efficient, and packaging does not meet modern standards. Many enterprises lack modern management practices, investment capital, and the financial resources to compensate skilled labour adequately.

Provision of appropriate education and training opportunities is vital to ensure a strong foundation for the sector. Ensuring knowledge transfer and dissemination of research from organizations to sector is an area for development, as is ensuring Moldova food processing industry needs are addressed in research programs going forward.

Table 3. The share of households and farms in the total volume of crop production 2001-2010, %

Cultures	Average 2001-2004	2005	2006	2007	2008	2009	2010
Autumn wheat	34,1	33,9	31,8	23,6	29,7	33,0	28,7
Barley	32,7	34,1	31,1	26,3	26,8	30,5	36,0
Corn	83,5	84,3	88,8	91,3	83,8	89,9	84,5
Leguminous	56,6	54,1	56,6	53,9	56,9	51,4	58,9
Sunflower	45,5	42,0	38,9	33,4	31,7	33,2	30,2
Soy	34,3	27,1	24,4	32,9	26,0	31,3	22,3
Sugar beet	23,2	17,6	19,7	14,8	9,6	12,1	13,5
Tobacco	23,5	3,0	16,7	19,4	17,9	13,6	19,7
Potatoes	96,4	96,3	96,1	88,6	90,7	88,9	83,4
Field vegetables	81,6	83,6	83,5	80,2	78,9	84,5	83,9
Cucurbits	87,2	94,4	96,0	96,6	96,7	97,5	97,8
Fruit and berries	52,7	52,3	58,2	52,1	50,5	57,9	59,8
Grapes	73,3	76,3	80,2	80,0	77,8	79,7	85,7

Source: Developed by the author based on the NBS data

Business performance has to be improved in response to changing market conditions, environmental requirements and efficiency in energy use. The need to comply with changing legislative requirements is of particular concern to the sector, especially the on-going series of changes to EU Food Safety regulations in general and pesticide in particular, and its impact on primary producers.

Access to technical advice and guidance is vital to protect and grow the sector that is currently not effective. Key focus opportunities for development of more sustainable and efficient practices are related to resource management and organic production.

By common effort of the Ministry of Agriculture and Food Industry of the Republic of Moldova and Agricultural Competitiveness and Enterprise development Project (USAID) three commodity chains have been analysed, namely on table grape, apple and tomato. [2, 8, 9]

The process included meetings and discussions between project experts and representatives from the Ministry of Agriculture and Food Industry, the Moldovan Producers Association and Exporters and the Institute of Applied Science in Horticulture and Agri-food Technology. The key informants for the analysis were private companies, family farms, public institutions and associations. While government data collection has improved significantly, there is still doubt expressed over the reliability and accuracy of official figures, particularly in relation to crop production and imports and exports. In the case of costs, import and export data, where possible, official figures were corroborated with traders to determine accuracy of quantities.

Finally, the disclaimer needs to be made that a value chain approach only provides an overall picture of underlying costs, profits, and trade competitiveness. Scarce information used for value chain diagnosis does not always allow extending quantitative assessment upon individual producers, local traders, processors, and distributors. Very often, they use their own cost and pricing structures that can vary significantly from the overall estimates. Therefore, the results of the analysis should be considered as providing indicative distribution of the value added along the chain of actors.

For the proactive approach regarding the vertical integration in agri-food sector, the horticulture has been selected. The working group created within the Ministry of Agriculture and Food Industry continued discussing the Program for Horticulture Sector Development. The reason of creation of such a group represented by stakeholders from research institutes, primary

production, food industry and trade, was that the subsector is still undeveloped in spite of being given a priority. The horticulture sector in Moldova faces a number of challenges related to post privatization period, as well as to transition to market economy, in order to achieve continuing sustainability and profitability whilst meeting the evolving and complex demands of consumers and the environment. Changes in the increasingly global market and the pressure to mitigate the worst effects of climate change are influencing agricultural policy direction in Moldova, like in many other countries.

Moldova horticulture is a beneficiary of support provided by international organizations in such areas as infrastructure development (roads, irrigation systems, transfer of modern technologies and innovations, provision of training on postharvest handling and organization of business trips to learn modern technologies, provision of market intelligence.

Cluster and sub-cluster needs assessments and market studies prepared by international projects in Moldova are the basis for the developing a Program as they contained recommendations based on the latest analysis of horticulture sector in Moldova as well as benchmarking and best world practices and experience. They give advice on how to strengthen the capacity of Moldova growers and producers to meet export market demands, to improve income generation from horticultural activities, develop agribusiness capacity to identify and diversify export markets and meet demand.

It is also recognized that there is a need for more Moldova-specific baseline data to provide an evidence base from which to develop, benchmark and monitor the sector and to raise the profile of horticulture in Moldova and the contribution it makes. So far the lack of the horticulture baseline statistics hindered to make reliable forecast.

The Program will include the following high value agricultural products that will be categorized into three main groups:

- Fruits (including berries) and nuts, including fresh/chilled, frozen and dried fruits;
- Vegetables, including fresh/chilled, frozen and dried vegetables;
- Processed fruits and vegetable products, including juices and canned fruits and vegetables.

The current task for Moldova is to develop the export potential, new products and find new market niche and to meet the needs of the internal market. The Program will be a sequence of concrete operations, which serve as a tool for policy implementation, containing clearly defined objectives, resources required, pre-defined target groups and deadlines.

CONCLUSIONS

- Moldovan agri-food sector is characterized by weak linkage between primary agriculture, processing and trade.
- The specific feature of the large scale food industry of the Republic of Moldova is underutilization of its production capacities and lack of investments.
- Recently, a new system of vertical integration had started to develop in the agri-food sector.
- The main drivers of the agri-food chain revitalization are mostly food business operators and traders
- Producers associations have demonstrated limited abilities to develop efficient agri-food value chains
- Diagnosis of the agri-food value chains is at the initial stage in the Republic of Moldova
- More Government and donors implication is needed to foster the elaboration of policy documents based on value chain diagnosis

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