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# LOCAL FOOD SYSTEMS DEVELOPMENT IN THE REPUBLIC OF MOLDOVA: CHALLENGES AND OPPORTUNITIES

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***Abstract***

*The main challenge of the food sector in the Republic of Moldova is to identify specific needs and opportunities for agriculture and rural development throughout food supply chains, and focusing investment in areas where the most impact will be made. The identification and allocation of resources requires analysis of main dimensions of food supply chains, in order to establish links and determine local factors. In small transition economies the diagnosis of the food supply chains, is typically based on limited data and incomplete information. In order to investigate the actual state of food supply chains were used specific methods and techniques: statistical and economic analysis of macro-economic indicators, semi-structured interviews of key stakeholders, analysis of the impact of public policies on the agro-food sector. In the article is analyzed the process of food systems formation and integration at the local and global level. Although it is a small part of the overall agricultural sector, various local food systems are under development in the Republic of Moldova. These systems bring consumers in close contact with farmers and mobilize them to support local farms and sustainable farming practices. While local food systems continue to face many barriers, many of them show considerable potential for growth.*

***Key words***: *agriculture, food processing industry, local agro-food systems, food markets*

## INTRODUCTION

The purpose of this paper is to present an analysis of the socio-economic environment of the local agro-food production systems, and challenges and opportunities for their development.
During the last decades the food production, processing and consumption in the Republic of Moldova has been changed significantly both at the local and international levels.
In agro-food systems, many international companies have organized their production in developing and transition countries in order to be more competitive on the global market.
This process is accompanied by positive and negative effects which can influence the welfare of the local population and the sustainability of the national agro-food sector.
At the same time, local production systems are competing on the external and internal markets by producing specific quality goods, through a more efficient use of local resources and rapid adjustment to changing market requirements.
As a result, a wide range of local agro-food systems has occurred, ranging from simple local food suppliers to more export oriented food industries. These systems are developing according to availability of local resources such as land, water, climate conditions, production costs, labor force, and the localization of internal and external markets.
In this perspective, local agro-food systems become the focus of the analysis in order to evaluate the level of sustainability and necessary policy requirements.
The challenge for the Moldovan agro-food sector is to identify specific agricultural and rural development needs and opportunities across the local agro-food systems, and to focus investment on those where the greatest impact will be achieved. This identification and resource allocation process can be facilitated by analyzing the main unresolved issues concerning the factors influencing their dynamics and effects, at both local and international level [0, 0, 0, 0, 0].

## MATERIALS AND METHODS

Responding to the need for new methodological approaches in agro-food research we employed in-depth qualitative, survey and case study research, to analyze the local agro-food production systems.

A central objective of our study was to understand and characterize the local and regional aspects of the food systems in the Republic of Moldova. Our research methods were multi-faceted, including:

1)historical research on the agricultural development,
2)in-depth interviews with agro-food network actors,
3)analysis of the available statistical data, and
4)case study approach.

The research was focused around three main topics: development of the agricultural sector, processing industries and local food markets.

Constraints and opportunities for local agro-food systems that are faced by small farmers and processors were described.

A case study on the development of the local dairy production system that creates new relations between producers and consumers and provides food security was elaborated.

## RESULTS AND DISCUSSIONS

Since the beginning of the XXI century one can observe a very high level of changes in agro-food systems, globally, as well as regionally and locally. An agro-food system includes a set of activities and relationships that interact in order to determine the type, quantity, methods and actors involved in the production, processing, distribution and consumption of the food.

Food systems include not only aspects of food production, but also preparation of farm inputs, processing, distribution, access, use, and recycling of food wastes [0].

Accelerated growth of the food industry in developing and transition countries involves certain risks related to equity, sustainability and inclusion.

Given an unbalanced market power in the food chain, value addition and capture can be concentrated on one or a few participants of this chain in the detriment of others.

Food industries can be sustainable only if they will be competitive in terms of costs, prices, operational efficiency, product offerings and other associated parameters and if prices paid to farmers will be remunerative.

Global transformation and upgrading of agro-food sector faced many challenges over time. Countries with economies in transition were involved in complex processes of transformation of political and economic systems.

In these countries, the liberalization of exchange rates and prices, and privatization of farms and enterprises caused a collapse of the system of vertical coordination and significant disturbances in the agro-food chain [0].

Disruption in relations between farmers, input suppliers and food companies also resulted in severe constraints faced by many farms in accessing essential inputs such as feed, fertilizer, seed, capital, etc.

Also in many countries with economies in transition privatization and market liberalization led to a decline in the supply of inputs and credit to farms and disrupted agricultural activity of several state-controlled institutions, agricultural and consumer cooperatives and processing enterprises [0].

In the case of Moldova, the results of the reforms have still not reached initial expectations. Currently, Moldova remains dependent on agriculture, which contributes about 12% to GDP. More than 30% of the country's working population is employed in agriculture and food sector.

Agriculture is one of the key driving forces in shaping Moldovan landscape, nature and culture over centuries. Favorable 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 along with the disruption of production and distribution networks. Land areas used for high value crops have been reduced more than twice. The shift in production has also been accompanied by significant reductions in land productivity.

This situation is directly related to lack of investments, capital and credit availability to the agricultural sector, factors that have resulted in farmers applying low yield technologies and drastically reducing their use of agricultural inputs, especially such as fertilizer and other agricultural chemicals. The agricultural sector benefits with only 11.1% of capital investments, and the foreign investments in the Moldovan agriculture are even more modest, with only 4.4% of total investments in agriculture in 2011 [0].

Agriculture and food industry play the main role in the food security assurance and export growth. At present the competitiveness of the agro-food sector of the Republic of Moldova is insufficient and depends considerably on institutional and market risks.

Despite of the problems related to the transition period the food industry has maintained its importance. Thus food processing and beverage industry contributes with almost 50% of the total processing industry production [0]. 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 and dairy production.

Agriculture is divided into two distinct sectors: the commercial and the subsistence one. The vast majority of people engaged in agricultural work in small scale subsistent farms.

Following challenges and constraints affect the development of the product value chains in the agro-food sector of Moldova:

a)low productivity in agriculture,

b)brain drain from rural areas, and

c)reduced efficiency of the energy sector.

**Low productivity in agriculture.** Subsistence farms provide a considerable part of agricultural production both in plant production (Table 1) and animal husbandry (Fig. 1).

Cultivation methods among subsistence households and peasant farms remain traditional, with a low level of mechanization and productivity.

Table 1. Share of households and peasant farms in total agricultural plant production, 2007-2011, %

| | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| Winter wheat | 23,6 | 29,7 | 33,0 | 28,7 | 28,3 |
| Barley | 26,3 | 26,8 | 30,5 | 36,0 | 37,7 |
| Corn | 91,3 | 83,8 | 89,9 | 84,5 | 80,9 |
| Leguminous beans | 53,9 | 56,9 | 51,4 | 58,9 | 69,5 |
| Sun flower | 33,4 | 31,7 | 33,2 | 30,2 | 31,9 |
| Soya | 32,9 | 26,0 | 31,3 | 22,3 | 21,6 |
| Sugar beet | 14,8 | 9,6 | 12,1 | 13,5 | 8,5 |
| Tobacco | 19,4 | 17,9 | 13,6 | 19,7 | 22,2 |
| Potatoes | 88,6 | 90,7 | 88,9 | 83,4 | 84,6 |
| Vegetables | 80,2 | 78,9 | 84,5 | 83,9 | 84,0 |
| Fruits and berries | 52,1 | 50,5 | 57,9 | 59,8 | 62,2 |
| Grape | 80,0 | 77,8 | 79,7 | 85,7 | 78,6 |

The agricultural sector is highly dependent on climatic fluctuations. Inefficient agricultural systems, underdeveloped market structures, extensive land parceling are just some of the factors that determine the insufficient potential for delivering sustainable primary agricultural product in the framework of the value chain.

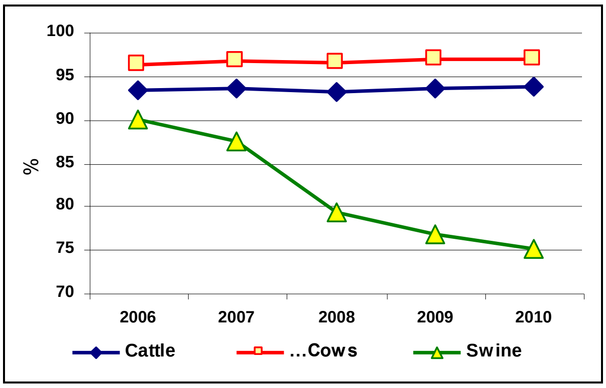


Fig.1. Share of households and peasant farms in selected animal production, 2006-2011, %,

Absence of highly productive agricultural technologies has led to land degradation due inobservance of crop rotations, soil erosion, deforestation, and limited technology adaptation to climate changes.

**Brain drain from rural areas**. The first waves of emigration took place in the early 80's of last century. From that time until the present the active population decreased by about one third, and in recent years the rate of reduction of the active population averaged 2.8% annually. The state of the active population in 2011 was 1,257,000 people, including people employed - 1.173 million and 84 thousand unemployed.

From the Republic of Moldova emigrate mainly professional trained persons of working age due to the fact that developed countries impose additional selection criteria for immigrants such as health status, age, state of the criminal record, general and professional education, knowledge of languages etc.

As a result is deteriorating the demographic situation and the genetic potential of the country, it increases staffing problems of industrial and agricultural enterprises. In particular there is a lack of highly qualified teachers, especially in rural areas.

**Low efficiency of the energy sector.** At present consumption structure of the electricity in the Republic of Moldova is dominated by public consumption - about 35% and about 30% is industrial consumption. Other sectors of the economy such as agriculture, construction, transport and so on, play an insignificant role in the structure of the energy consumption.

Energy efficiency in Moldova is very low and is almost 3 times lower than in European countries. This leads to a substantial increase in energy costs.

Currently, there are following constraints for raising energy efficiency in Moldova:

- High energy consumption, which contributes to increased energy intensity;
- Increasing energy prices;
- Technologies and equipment is morally and physically outdated;
- Lack of knowledge and skills in energy efficiency and renewable energy resources;
- Excessive dependence on energy imports (95% of the country's energy is imported).

The value added to the agricultural raw material is very small. Domestic agricultural production and exports are mainly specialized in raw materials and semi-finished food products. Thus, comparing the output of the food industry and production of the agricultural raw materials one can observe that in relation to each lei of agricultural production occurred only 0.63 lei of food industry production in the year 2011, which is lower than the level of this indicator during the 90th years of the last century. Moreover, this indicator has a decreasing trend during the last years, confirming the process of stagnation in the food industry (see Figure 2).

The competitiveness of the food industry is directly affected by outdated technologies, which do not allow the efficient use of energy resources. In turn, the low efficiency of the energy sector of the Republic of Moldova has a negative impact on the development of processing industry for agricultural raw materials.

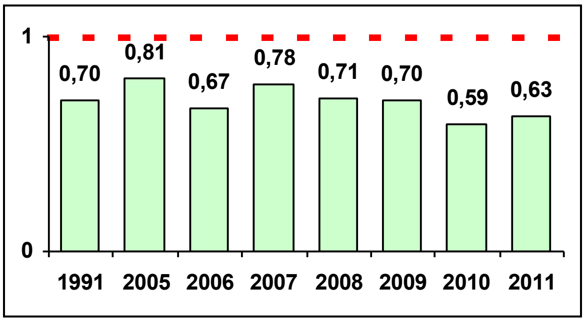


Fig. 2. Ratio between the production of the food industry and total agricultural production, 1990-2011

Traditionally the food processing industry of the Republic of Moldova was divided in two groups, namely the first one represented by large scale food processing plants, oriented mainly toward export markets and the second one supplying the local markets.

During the transition period a significant changes have taken place. Thus a large part of the export oriented food industries such as ”Processing of fruits and vegetables”, “Sugar production”, “Production of alcoholic distillates” and “Vine production” that encompass mostly large scale enterprises, have suffered a serious decline (see table 2).

At the same time in different rural areas, predominantly in suburbs have appeared a impressive number of small and medium scale food business operators dealing with a wide range of food products such as “Production and processing of meet and meet products”, “Production of bread and bakeries”, “Production of cacao and chocolate products”, "Dairy products", "Production of mineral water and soft drinks" etc.

These industries that are oriented mostly toward local markets show an increasing trend during the last years (Table 3).

Table 2. Declining and stagnating food industry sectors, 2007-2011, 2005=100%

| | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| Tobacco products | 72.4 | 62.4 | 72.6 | 94.4 | 100.2 |
| Processing of fruits and vegetables | 115.5 | 109.2 | 84.0 | 84.3 | 80.5 |
| Sugar production | 55.6 | 98.7 | 36.5 | 91.3 | 71.0 |
| Milling and starch production | 95.1 | 105.0 | 88.6 | 79.7 | 71.0 |
| Production of alcoholic distillates | 50.1 | 53.0 | 42.0 | 46.7 | 56.9 |
| Vine production | 36.3 | 45.2 | 35.7 | 37.8 | 39.1 |

In the Republic of Moldova vertical coordination among primary agricultural production, food processing and trade, had undergone dramatic changes in the midst of 90th.

Table 3. Increasing food industry sectors, 2007-2011, 2005=100%

| | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| Production of animal feeds | 97.1 | 110.9 | 194.3 | 231.8 | 332.9 |
| Production and processing of meet and meet products | 142.9 | 147.2 | 121.9 | 127.6 | 142.5 |
| Production of mineral water and soft drinks | 147.0 | 128.7 | 118.4 | 123.0 | 133.0 |
| Production of bread and bakeries | 118.4 | 129.0 | 121.2 | 124.8 | 127.3 |
| Production of cacao and chocolate products | 116.5 | 126.1 | 117.2 | 119.6 | 126.3 |
| Dairy products | 101.7 | 108.3 | 98.1 | 107.0 | 109.2 |

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 agro-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 agro-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 agro-food markets by individuals and legal entities that produce, store, process and/or sell these products at the national or international level.

Main objectives of this law are the as follows:

a)organizing activities of agro-food markets on competitive, effective and stable principles;

b)covering the domestic food consumption and reducing the food trade deficit;

c)ensuring the quality and safety of food products;

d)increasing incomes from farming and agro-food activities;

e)assuring a sustainable growth of economic performance and competitiveness of the agriculture and food industry;

f)increasing exports of agricultural products.

An important provision of this law stipulates creation of the Councils on product chains as a body established by participants from the product chain and representatives of public authorities [0].

The activity of the Councils on products is 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 is insignificant. The further intervention of the Government is needed to improve the value chain efficiency.

Distribution of food products in Moldova still rely on traditional markets. The food trade in the capital city and regional centers is effectuated also through a chain of recently appeared supermarkets. There are currently about 190 supermarkets and three commercial Cash and Carry units that sell food products all around the country.

According to our estimates, approximately 10-20% of Moldova's population buys food in supermarkets. Respectively the greater is the size of the urban center the greater is the share of supermarkets in food product sales.

In Moldova there is a trend that has been also observed in other Western European countries, namely at the launch phase of supermarkets fruit and vegetables occupy less than 5% of commercial space in a typical supermarket. This percentage is even lower for stores or local food stores. The most developed retail chains in Moldova are: Fourchette, Green Hills, Nr. 1, Fidesco, Metro Cash & Carry, IMC Market, Linella, Cvin and Everest.

If we analyze the traditional channels of distribution, one can we observe the presence in urban areas of over 1000 of neighborhood grocery stores. Thus, about 20-40% of food purchases are made at these stores, which are located in the home vicinity. Many of these stores do not sell a full range of fruit and vegetables that occupy less than 3% of the commercial space.

At the retail level, the inhabitants of Moldova as a rule procure agricultural products at local agricultural markets, street fairs and seasonal fairs and also from other small scale street vendors. However in rural areas, a considerable part of agricultural products is used for own consumption.

Nowadays the distribution network for fresh agricultural products encompasses 3 wholesale markets in Chisinau and one in Balti, 12 retail agricultural markets in Chisinau, plus another 38 regional agricultural markets and over 100 of local agricultural markets.

The agricultural market “Izumrud“ (Albisoara str.) sells mainly local produce such as potatoes, carrots, onions, cabbage, radish, etc.) during the period from March to December. Imports from Poland, Turkey and Ukraine supplies the same products during the out season. Sales are done as a rule directly from trucks and other vehicles. This market can offer 15 stalls for sale and at least 100 places for sales directly from the truck. The market has its own testing laboratory. The customers of this wholesale market are households, retail markets and neighborhood grocery stores and catering units.

The wholesale market “De sub pod“ (Under the bridge) on Albisoara street mainly sells exotic fruits and vegetables imported from Turkey. This market has 70 marketing units of 12-15 $m^2$ each, which can be rented. Also, the market offers around 120-150 locations for sales directly from the truck.

The wholesale market "Amir" sells a range of fresh produce imported from Turkey, Poland and Ukraine. Eight cold stores with a capacity of 65 tons each are available for hire, and they are quite demanded.

The market also offers 153 marketing units with an area of 12-15 $m^2$ each that are available for rent, and about 100 places for sales directly from the truck. This market has its own testing laboratory. The customers of this wholesale market are mostly retail markets and supermarkets.

While representing a small part of the whole agricultural complex different local food systems are developing. These systems provide consumers in close contact with farmers, they mobilize consumers to support local agricultural producers and sustainable farming practices. While local food systems continue to face many barriers, many of them show a significant increase.

As a typical case of local agro-food system development one can mention the dairy sector of the Republic of Moldova, which during the transition period from centralized to market economy has suffered a serious decline. During the post reform period, from 1991 until now, the herd has been reduced significantly. Thus, the herd of cattle in this period fell from 1.061 million heads in 1991 to only 204 thousand heads in 2012, a drop of 5.2 times, while the herd of cows in the same period decreased 2.7-fold, from 395,000 to 144 thousand heads.

Nowadays, this sector is extremely parceled and depends largely on production in the

households of the population. Household milk production assured about 98% of the total cow milk production in 2011. In most cases the number of cows maintained in households does not exceed 1-2 heads. The wide involvement of the individual small-scale sector in the livestock production creates considerable obstacles in terms of compliance with hygiene standards, animal nutrition, and environmental protection norms in the Republic of Moldova, but also with those in force in importing countries.
The small size of farming units and the difficulties they faced in adopting standards of hygiene, environment, and animal health, accompanied by lack of vocational education in agriculture can be identified as the main obstacles in developing the dairy sector of the Republic of Moldova.
An alternative to individual milk producers to increase their bargaining power in relation to the processing industry is creating local associative structures.
Milk collection cooperatives have become in recent years an attractive consumer for small scale milk producers. The number of milk producers that have signed agreements on deliveries of milk with marketing cooperatives increased from 11% in 2001 to 21% in 2012, while the average volume of milk supplied under the contract also increased during this period from about 51% to about 88%.
Data of the study elaborated by the authors has demonstrated that an increasing role in collecting milk from farms is played by cooperatives that are an important milk consumer for about 21% of interviewed milk producers. Supplies to the local markets including local agricultural markets, schools and kindergartens, cafeterias and other local catering units are destinations of milk supplies for about 25 percent of respondents.
Thus, about 46% of interviewed milk producers deliver milk to industrial and final consumers located in close proximity, creating conditions for establishment of local food systems without involving other intermediate structure (see figure 3).
A good example here is the milk collecting cooperative “Vita-Lact” the village Ignăţei, Rezina district, which was established in 2001 by 12 farmers in order to consolidate their efforts to work together as a single entity for selling the milk collected from local milk producers.
Subsequently the cooperative has grown from 12 members in 2001 to over 420 members in 2011. Currently the cooperative manages 12 milk collection points located in neighborhood villages [0].

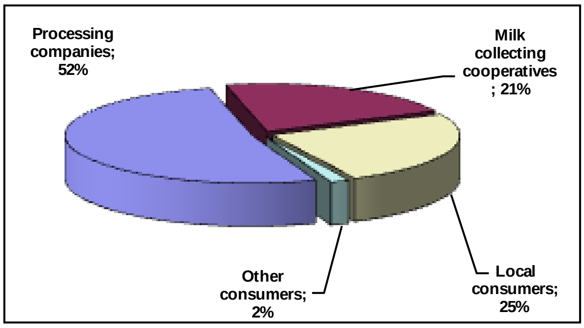


Fig.3. Distribution of milk producers according to distribution channels, 2011, %

Cooperative benefited from divers opportunities to train their members in fields such as cooperative development and administration, financial management, marketing techniques, veterinary services, milk processing and handling.
The status of cooperative made it possible to access various grants provided by international organizations. These funds were used to purchase milk processing and cooling equipment, milk testers for endowment of the milk collection points, purchase of a minibus, other agricultural equipment and building new milk collection points. These funds have enabled the cooperative to develop its own milk processing infrastructure. Thus with the contribution of cooperative members was established a milk processing unit "Paster Lact" SRL that allowed the marketing of milk and milk derivatives directly to the retail network, thus increasing revenues of the cooperative and hence of its members. Cooperative began to develop its own marketing network for final products by launching own market outlets, including in the capital city Chisinau. Currently the cooperative “Vita-Lact” supplies directly several grocery stores from Chisinau, Orhei

Rezina and Soldanesti. The cooperative is also a major raw material suppliers for the milk processing enterprise "Saturn" SRL, which produces under the brand "Bravi-Lacta".

Among recipients of the production from the "Vita-Lact" cooperative are also educational institutions such as kindergartens and schools in the neighborhood villages such as Meseni, Pripiceni and Peciste. During the summer period among beneficiaries of the cooperative are also summer camps for children in villages Saharna and Ignatei. The benefit in this case is mutual. Thus consumers have access to fresh, quality, healthy and affordable milk produces, while the cooperative benefits from a higher price of 6-7 lei/kg and direct sales to local market outlets.

Extending the up-stream vertical integration of the cooperative activities toward processing and sales to local consumers has many benefits such as reducing working capital requirements, elimination of prohibitive transaction costs, more competitive selling prices and acquiring more safe markets. There are also many social benefits out of the creation of this cooperative unit. Thus, occurrence of six new working places in a village has a special significance in the situation when there is a continuous flow of qualified labor from the rural to urban areas or outside the country, thus contributing to improving the livelihoods of the rural population.

Creation of local cooperatives can be seen as one of the most perspective forms of organization of agricultural production, which may comprise several aspects of agricultural production, such as finance, procurement of agricultural inputs, collection, transportation, and storage of agricultural products, as well as other specific activities particularly related to agricultural production.

## CONCLUSIONS

Moldovan agro-food sector is characterized by a reduction of the share of high added value products in total agro-food exports.

The food processing sector has week linkage between primary agriculture, processing and trade especially at the local level.

The specific feature of the agro-food sector is underutilization of its production capacities and lack of investments.

Recently, new local food systems have developed in the agro-food sector.

The main drivers of the agro-food chain revitalization are mostly food business operators and traders.

Wholesale food markets are predominantly supplied by local producers.

Overall, the wholesale food markets that currently activates in the Republic of Moldova are poorly equipped and under obsolete standards.

An important role in creation of the local agro-food systems is played by associative structures such as marketing cooperatives.

Almost half of the interviewed household milk producers deliver milk to industrial and final consumers located in close proximity, creating conditions for establishment of local food systems without involving other intermediate structures.

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