

## MODERNIZATION OF THE AGRICULTURAL SECTOR IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT IN THE REPUBLIC OF MOLDOVA

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### **Abstract**

*This paper focuses on the links between agricultural modernization and sustainable development, looking in particular at the impact of the structural changes over the rural livelihoods. In order to achieve this, there were used the following research methods such as: analysis of the economic indicators, methods of comparative analysis, assessment of the public policies' impact on the rural development. The agricultural sector in the Republic of Moldova is based on extensive farming and is insufficiently adapted to market economy conditions. There is a growing understanding in the country that the rural economy is not confined to the agricultural sector, but embraces the broad spectrum of needs of all rural people including living standards, economic activities and natural resources. The situation is associated with the major risks related to the structural changes that may affect the countryside and the economy as a whole such as: a) migration and uncontrolled urbanization, b) lack of professional qualifications and adaptability of the population in the rural areas, c) inadequate use of the natural resources. Rural economy, employment issues, natural resource management and also goals and circumstances of the agricultural production have changed considerably. At the same time, academia and civil society are aware that the new paradigm of modernization must begin both with the agricultural technologies and the people. Its novelty is that in the combination of financial, economic and technological policies for agriculture, new components to be introduced, like policies aimed at improving human capital in agriculture and environmental protection. The paper contains conclusions and proposals on modernization of agriculture and diversification of non farm activities in rural areas.*

**Key words:** agriculture modernization, diversification, human resources, sustainable development

### **INTRODUCTION**

The world has witnessed spectacular increases in agricultural output during the twentieth century, particularly in its latter half. This achievement is mainly ascribed to the improved agricultural practices leading to higher productivity of land and labour. The contribution of extensive cultivation has not been significant of late. Bringing more land area under agriculture is becoming more and more difficult in most countries. Since prosperous agriculture is considered to be the most crucial base for economic development particularly in the less developed countries, the only viable option for them is to continue to enhance the productivity of land and labour in agriculture. Increased productivity in agriculture has been achieved in several parts of the world mainly by modernizing agriculture. Modernization consists largely of

using improved seeds, modern farm machinery such as tractors, harvesters, threshers, etc., chemical fertilizers and pesticides in an optimal combination with water. The main aim of the paper is that it focuses on the links between agricultural modernization and sustainable development, looking in particular at the impact of the structural changes over the rural livelihoods. Its novelty is that in the combination of financial, economic and technological policies for agriculture, new components to be introduced, like policies aimed at improving human capital in agriculture and environmental protection.

### **MATERIALS AND METHODS**

In order to achieve a comprehensive analysis of the studied problem, the following research methods were used, such as: analysis of the

economic indicators, methods of comparative analysis, assessment of the public policies' impact on the rural development, etc. The made calculations are based on the data provided by the National Bureau of Statistics, Ministry of Economy, Ministry of Agriculture and Food Industry, etc.

## RESULTS AND DISCUSSIONS

Agriculture is a predominant activity in most developing countries. As economic growth and development take place, importance of agriculture tends to decline according to the famous hypothesis. The declining share of agriculture is, however, a slow phenomenon and is felt only over a relatively long time horizon. The implication is that growth of total income exceeds that of agricultural income over a long time.

Sustainable development has three principal dimensions: economic growth, social equity and protection of the environment. Underlying the economic dimension is the principle that society's well being would have to be maximized and poverty eradicated through the optimal and efficient use of natural resources. The social aspect refers to the relationship between nature and human beings, uplifting the welfare of people, improving access to basic health and education services, fulfill food security needs and respect for human rights. The environmental dimension, on the other hand, is concerned with the conservation and enhancement of the physical and biological resource base and ecosystems.

Global transformation and modernization of the agri-food sector faced many challenges over time. Countries with economies in transition faced with 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 agricultural branch. 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.

In the case of the Republic of Moldova, the results of the reforms have still not reached the initial expectations. The agricultural sector in the Republic of Moldova has not yet been recovered from the decline in production and productivity, which occurred during the '90s. Currently, the Republic of Moldova remains dependent on agriculture, which has a contribution with about 12% to GDP.

Table 4. The share of agriculture in the nominal GDP

Year	GDP nominal (million MDL)	Share of agriculture in GDP (million MDL)	Share of agriculture in GDP (%)
2002	22556	4 729	21,0
2005	37652	6 158	16,4
2006	44754	6 474	14,5
2007	53430	5 316	10,0
2008	62922	5 524	8,8
2009	60430	5 110	8,5
2010	71849	8 557	11,9

More than 30% of the country's working population is employed in agriculture and food sector, which reflects the situation characteristic for the countries with an insufficient regional development, when the major territory of the country is characterized by a predominance of unproductive and low-paid agricultural work. Agriculture is divided into two distinct sectors: the commercial and subsistence agriculture. The vast majority of people engaged in agriculture work in small and medium non-trade farms.

The share of agriculture in GDP and the employed workforce is continuously decreasing in relative terms, and the last one even in absolute terms. Meanwhile agriculture continues to grow in absolute terms and provides growth for the entire economy. Structural changes thus involve a net transfer of resources from agriculture to other sectors of the economy in the long term.

There is a common view on many of the mechanisms leading to agricultural and economic development. The first is the ability of agriculture to create jobs and enhance the welfare of the rural population by increasing agricultural productivity. These relationships are seen through input-output relations that link the industry sector with the agricultural one through the production of raw materials used by the industry, ensuring access to food, delivery of job places on one side and on the other side, the agricultural sector capacity development to serve as a market for sale of industrial products.

The agricultural sector in the Republic of Moldova is based on extensive farming and is insufficiently adapted to market economy conditions. There is a growing understanding in the country that the rural economy is not confined to the agricultural sector, but embraces the broad spectrum of needs of all rural people including living standards, economic activities and natural resources. The situation is associated with the major risks related to the structural changes that may affect the countryside and the economy as a whole such as: a) migration and uncontrolled urbanization, b) lack of professional qualifications and adaptability of the population in the rural areas, c) inadequate use of the natural resources. Agriculture by its nature is a risky activity. For this reason it can have negative effects on agricultural income, food security, capacity of development and attracting investment, and competitiveness of the sector.

The main factors that determine the size, quality and stability of the agricultural production in the Republic of Moldova are the agricultural and climate conditions of the territory, especially the lack or surplus of humidity, caused mainly by the actual changes of the climate.

In the Republic of Moldova, risks in agriculture are aggravated due to a variety of factors:

- Insufficient financial resources in an underdeveloped economy
- Infrastructure of protection against natural hazards is underdeveloped at the local level

- The insurance sector is at an early development stage
- Reduced capacity of agriculture to adapt
- Lack of coordination and division of responsibilities between the institutions involved in natural hazards mitigation
- Insufficient public awareness and of policy makers.

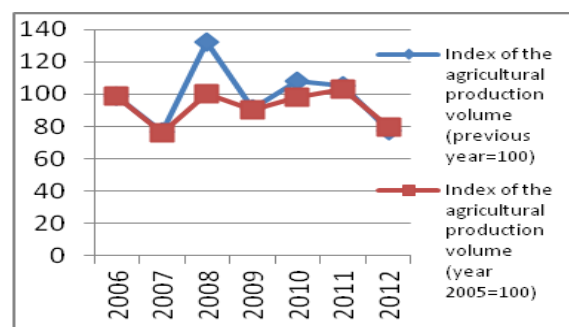


Fig. 1. Index of agricultural production volume

Rural economy, employment issues, natural resource management and also goals and circumstances of the agricultural production have changed considerably.

In the Republic of Moldova there is a lack of funds needed for the sustainable development of rural areas. Also, there is no institution responsible for creating conditions for the development of rural areas and their development policies are dispersed.

At the same time, academia and civil society are aware that the new paradigm of modernization must begin both with the agricultural technologies and the people.

The last discussions organized by the Ministry of Agriculture and Food Industry have succeeded with the general vision materialized through the goal regarding the improvement of quality of life in rural areas by effective use of rural resources and potentials based on agriculture for the sustainable development of Moldova.

It is necessary the institutional strengthening for the implementation of these provisions, through the empowerment of the ministry of Agriculture and Food Industry.

Importance of the issue of modernization of agriculture in the Republic of Moldova led to the need to identify risk management tools for farmers proposed for implementation in

Moldova to ensure the sustainable development of the sector. An important factor for sustainable development in terms of modernization is the availability of labour force in rural areas. In the last five years, rapid changes are highlighted in employment in the agricultural sector as whole and agricultural enterprises in particular. Reducing the number of people involved in agriculture in all farming systems demonstrates inability of agriculture to absorb surplus of labor.

Reducing the importance of income from agriculture has also generated social and psychological changes. Thus, the prestige of agricultural occupations fell abruptly. From the total number of graduates from higher education institutions, only about 3% of the specialties are related to agriculture. Such trend is observed in secondary special professional institutions, which have significantly reduced the number of students from the agricultural specialty.

There are two ways to refer to urbanization. One of them states that the urbanization process is mainly related to the demographic aspect; the second one – sees urbanization as a socio-economic phenomenon that can be seen as a process of infiltration of the countryside by non-farm activities. [3]

Migration in urban areas and abroad in search of a job place is seen as a real alternative to agricultural activities in terms of providing a stable source of income for families from the rural area in Moldova.

Magnitude of migration in Moldova has increased dramatically in the last decade. During this period the working age population declined rapidly as a result of migration and other demographic processes. According to the National Bureau of Statistics, about 300 thousand people of working age are working abroad or looking for a job. According to some estimates, the total number of migrants, including unofficial migrants, amounts to about 700 000. Most migrants come from rural areas, reflecting the necessity for the sustainable socio-economic development of rural communities in Moldova.

As a result of migration from rural areas, and changes in attitude towards agricultural

activities, professional level of the rural population is decreasing, despite the fact that the general level of education remains quite high. Thus, the majority of the rural population can be characterized by low professional skills and adaptation, which can not meet the growing demands of the labor market.

This creates an uncertain situation in rural economic development planning.

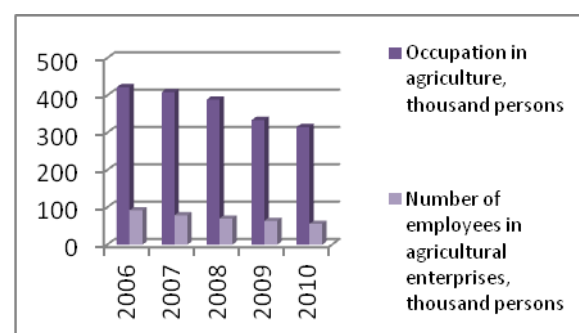


Fig. 2. Use of labour force in agriculture in the Republic of Moldova

Use of human capital has a strong connection with the improvement of the environmental protection of the agriculture, which is a prerequisite of modernization. Modernization of the agriculture and agricultural systems requires the implementation of policies in order to achieve a comprehensive result in the area of improving the agricultural productivity as well as environmental equality.

One of the proposes consists in the fact that human capital development is essential for improving environmental protection, modernization and resource conservation in agriculture. The public sector must play a central role in the development of this human capital.

New technologies evoke responses that are difficult to anticipate. It is thus essential to maintain proper incentives (e.g., taxes on the use of polluting inputs, setting prices of resources at their social opportunity costs, establishing clear property rights) in order to ensure that anticipated improvements in environmental protection, modernization of agriculture and resource conservation from the introduction of new technologies are actually achieved.

Agricultural policies such as price supports, input subsidies, and tariffs on imports are important causes of environmental and resource degradation in many countries. A reform in agricultural policy is necessary to improve environmental protection and resource conservation in agriculture. More broadly, it is imperative to integrate environmental protection and resource conservation into agricultural policies.

Modernization of agriculture from the Republic of Moldova may be related to the following directions of activities. Nonfarm activities have become an important component of livelihood strategies among rural households. Employment in non-farm activities is essential for diversification of the sources of farm household's livelihood. It enables households to modernize their production by giving them an opportunity to apply the necessary inputs and reduces their food shortage during periods of unexpected crop failure. Usually, participation in nonfarm activities is driven by inability to earn enough from agricultural activities due to the poor asset base or risky agricultural environment. Imperfections in rural institutions, such as access to credit or insurance markets can also stimulate nonfarm activities.

As a result of the agrarian economy analysis, we can identify two main components when considering the non-agricultural diversification - income and work.

Income and non-agricultural diversification hypothesis assume that diversification are the maximizes of the profit, while the second, non-agricultural activity and diversification indicates comparative advantages of different households underlying the incentives for non-agricultural diversification. The two types of non-agricultural diversification can be defined as follows: first, diversification due to income coincided with a period of capital accumulation (including financial and social capital, and information), while the second type of diversification led by activity often occurs later when the capital accumulation has already occurred. [2]

Diversification of income does not necessarily exclude activity diversification, it is a

dynamic and mixed process with activities and income diversification (by household) that often overlap or occur simultaneously. Thus, for many poor rural households, capital accumulation is a consequence of diversifying income and is not the objective of income diversification.

When considering the type of activities in which an active population is involved, there may be three different models of diversification: (i) interior, (ii) decline and (iii) the direction. Interior diversifications are those who opt for a second job in the same field (either agricultural or non-agricultural sector) as a main activity. This would be most common in case of small facilities with insufficient capital (financial or human).

Decline diversifications are those whose main activity is in the non-agricultural sector and choose a second activity in the agricultural sector. A predominance of diversification of decline indicates a situation where non-agricultural income does not cover subsistence needs, forcing people to return to agriculture, or where agricultural prices are distorted (either high because low levels of agricultural productivity and efficiency, or low due to state policies to protect low-income consumers in urban areas, but with a concomitant impact of disinvestment in agricultural communities).

Direction diversifications are those with a primary agricultural activity and secondary activity in non-agricultural economy. They are diversifications of risk-taking, of demand, having often a better endowment with financial and / or human capital therefore better equipped to take advantage of market opportunities, and thus being able to be diversified. It may also be the case that these direction diversifications can not find opportunities for diversification in agriculture and therefore try to reorient their activities (and / or sources of income) to non-agricultural activities[2].

Agrarian and non-agrarian economy can be directly linked through production activities, or indirectly through income or investments. Production linkages can be either ascending or descending: ascending links either occur

when agricultural sector grows and there is induced a growth upstream in the supply of inputs and services, or when the increase of local manufacturing and services reduces the price and increases the availability of increase in inputs; decreasing connections can occur when activities such as manufacturing and distribution, based on the means of agricultural production are increased and thus increase the demand for agricultural products. Links with revenues arise when a sector income is spent on results elsewhere, and investment linkages occur when a sector profit are invested elsewhere. All these links are important in the development of non-agricultural enterprises in developing countries and economies in transition. However, the links may be weak and the power of different linkages is specific in a context and depends on a number of factors.

## CONCLUSIONS

- Excessive dependence of the national economy on external income sources increases the uncertainty in the economic development of the country in the short and medium term.
- The major risks related to structural changes that may affect the rural area and economy as a whole, are mainly of social and demographic origin.
- Together with the decreasing of economic importance of agricultural activities in rural areas, there is the possibility and need for non-agricultural economic activities in order to achieve a greater coherence between urban and rural areas.
- In terms of economic degradation of villages, there is a need to support and implement strategies to promote remittances as a leverage of sustainable development of the rural areas.
- The reduction of the vulnerability of Moldova to natural risks shall be carried out during the change of the national economy's structure by an increased development of different sectors, based on advanced technologies. Simultaneously, radical transformations in the agricultural sector shall

be carried out by implementation of new technologies of land cultivation, enhancing the production, extending of forest areas and natural reservations, creating a national environmental network.

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