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## MULTIFUNCTIONALITY OF AGRI-FOOD SECTOR: THEORETIC CONCEPTION, PRACTICAL IMPLEMENTATION

*This paper presents some results of studies on multifunctionality of agriculture and agri-food sector (AFS). It is proved that «multifunctionality of agriculture» is connected not only with the definition of trade regime under WTO rules, but is the most important property and characteristics of the agri-food sector. To substantiate theoretical and methodological concepts proposed by MF AFS, conceptual apparatus of the study is suggested, five basic functions are revealed and characterized, and their relationship and interaction in practice is estimated. The risks involved in implementing each function are considered. A number of critical nodes of the current state of the Russian Federation's AFS is analyzed. Suggestions to full realization of the multifunctional nature of the AFS in a worsening global economic crisis and its particular form — food security crisis — are suggested. Directions of multifunctionality regional AFS research to elaborate a strategy for their development are named.*

**Keywords:** agriculture, agri-food sector

### 1. To developing a theoretical concept of AFS and agriculture multifunctionality

The term «multifunctionality of agriculture» began to be used in connection with the development of discussions on state support for agricultural production and its impact on the situation on the world food market in the WTO. Countries interested in export expansion argued that such support distorts market relations and hinders trade liberalization. Their opponents objected, arguing that agriculture not only produces and sells products, but also performs a number of socially important functions necessary to the harmonious development of rural areas, environmental protection etc. That's why it needs state support which should be provided. The first group of countries includes the United States, Canada, Australia and other major exporters of food. The second one — the EU states, Japan and developing countries, the states of the EurAsEC can be also referred to this group.

It should be noted that despite of all differences on the issue of support for the idea of multifunc-

tionality of the agricultural sector, it is recognized by the majority of representatives of the main states.

The interest in various aspects of multifunctionality markedly increased in the last ten years, not only in research but also in the practice of state regulation of agriculture. However, it must be admitted that so far a theoretical concept is not established, there is no methodology for investigating the nature of AFS multifunctionality. This is one of the reasons for the lack of results in economic science and the impact of its recommendations in the agrarian policy.

The All-Russian Institute of Agrarian Problems and Informatics named after A. A. Nikonov (IAPI) in 2007, had Nikonov's Readings on the subject of «Multifunctionality of agriculture and rural development». Reports and presentations were published as well as abstracts and reflected the ideas and some results of research in this direction. The Department of regulation of agricultural markets of IAPI last year embarked on a project of the Russian Humanitarian Foundation «Multifunctionality agri-food sector: a

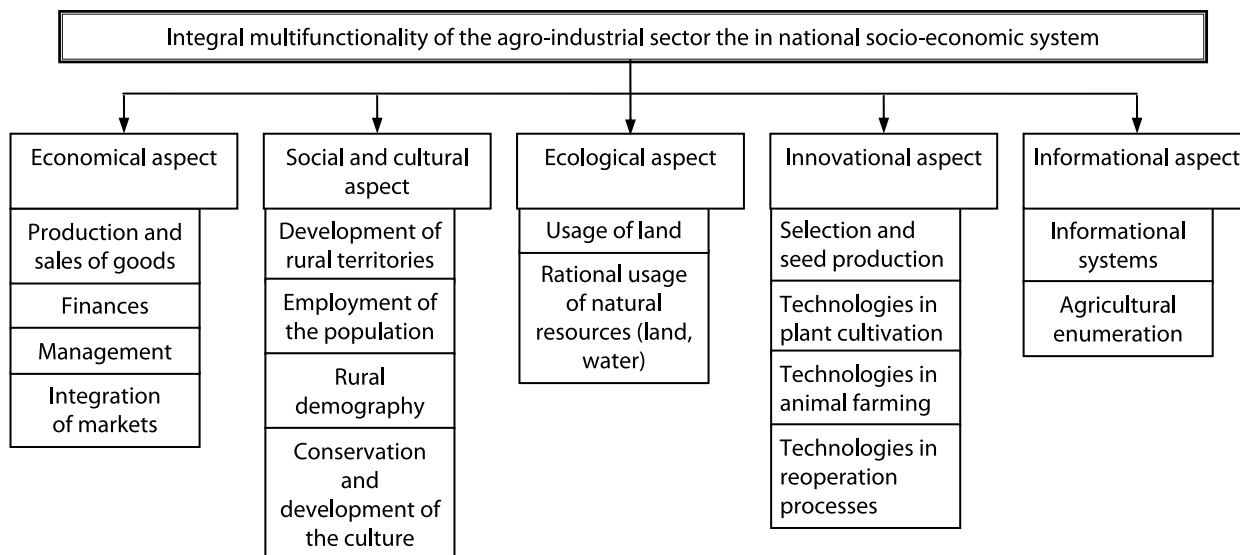


Fig. 1. Structure of the AFS multifunctionality

theoretical concept, the practical implementation» (project chief E. N. Krylatykh). Some results of the first phase of this project are presented in this paper. These include: the conceptual apparatus, the content features of AFS, their relationship and interaction, identification of risks in the implementation of functions and the possibility of regulation of AFS because of its versatility.

To the development of the theoretical concept of multifunctionality of agri-food sector (hereinafter — MF AFS) belongs the conceptual apparatus of the study. Basing on the results of empirical studies and various statements in the economic literature, we propose the work treatments of two basic concepts — «the agri-food sector» and «multifunctionality of the agri-food sector».

**The agri-food sector (AFS)** is a subsystem of the national economy, which is intended to provide the nutritional needs of the population while preserving and maintaining its vitality and reproduction, to facilitate and provide effective employment and socio-cultural development of the rural population, use and restore soil fertility and ecological balance in rural areas.

AFS combines the following areas: agriculture, production of final food products, their storage, transportation and marketing, socio-cultural service of the rural population, information and scientific support for this system.

Because the term «multifunctionality» has the word «function» in its etymological basis, it is useful to recall its meaning. The term «function» is derived from the Latin word «function», which means execution. In an extended interpretation, it is an

appointment or destination, activity, duty, performing the role, or a manifestation of the properties [3, p. 695-696].

**Multifunctionality of the agri-food sector (AFS)** — a set of socially significant goals and destinations, which provides systemic implementation of food security of the country, increasing production efficiency, harmonious development of rural areas, their ecological well-being and an innovative and informative progress in this sector.

Without pretending to perfection of proposed wording, we consider it reasonable to use them for subsequent discussion of the theoretical concept of the MF AFS.

If we proceed from the nature and mission of the AFS, we should name at least five of these functions: (Fig. 1).

1. *Economic function* includes: production to meet the needs of the population and ensure food security, the use of productive resources from other sectors and participation in the development of linkages, functioning of agricultural markets, increase the competitiveness of AFS, establishment and regulation of financial flows, investment attraction and its usage; contribution of AFS into the national GDP and other macroeconomic aggregates.

2. *Social function* provides the development of living conditions of rural population, social infrastructure, including education, cultural services, and provision of employment and leisure activities of the villagers, preservation and revival of indigenous culture of rural society in different regions of the country. These aspects of this function are the

content of the concept of sustainable development of rural areas.

3. *Ecological function* is determined by the use in agricultural production land and soil fertility, water, flora and fauna, and includes the maintenance of optimal water regime in each region, ensuring ecological balance in rural areas, preservation and development of the agrolandscape etc.

4. *Innovational function* reflects the needs and possibilities of genetic engineering, biotechnology, protection of biological objects from diseases and pests and other innovative development in the field of agriculture. In the area of agricultural raw materials biotechnologies are also used to ensure safety and quality. An innovative feature is implemented in the field of governance and economic management through the use of advanced methods and new technological possibilities.

5. *Informational function* is characterized by the fact that the agrarian sector in the implementation of the previously listed functions itself produces (generates, transmits) information for other areas, and also receives, processes and uses a large flow of information. The timeliness of receipt and transmission of its reliability depends on the quality of management decisions and performing all functions of the AFS. Information technology, including modern means of communication and data processing systems, are the core of governance and regulation at all levels of AFS.

Thus, the versatility of AFS determines the specificity of the agri-food sector in the structure of the economy. In turn, this specificity should be reflected in the methodology of analysis, forecasting, planning and management of AFS.

In line with the developed theoretical concept of MF AFS, it is useful to consider the relationship and interaction of these functions. The essence of this relationship is that each of them can be fully implemented with adequate development of the remaining four. Conversely, if at least one function is not implemented, it becomes a constraint in the implementation of all the rest. On the degree of systemic implementation of all five functions depends largely integrated agri-food sector performance in general.

Here is an example. The economic function is designed to ensure food security, which requires increased food production, improving quality and reducing costs. This requires a transition to innovative technologies in the production and management system. Even if we have this kind of ap-

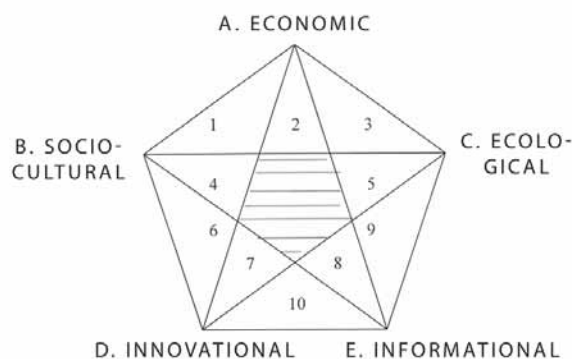


Fig. 2. Interaction of main functions inside the AFS

plied research, its practical application encounters a shortage of trained personnel for this purpose in the workplace. As a result, the issues of ecological character are not addressed, including the technologies which are not applied to maintain soil fertility. The main reason for staff shortages is unacceptable housing security and lack of other social benefits for experts. All this, in turn, complicates the realization of informational functions.

The studies of the relationship and interaction functions can be represented by logical and graphical models in the form of a pentagon. This model allows to visually reflect the connection of each function with all others (Fig. 2).

In this graphical representation of AFS multifunctionality we should mark the inside pentagon (shown in Fig. 2 as shaded). This is the field of integrated multifunctionality of AFS. Exactly in this field, the formation of two major successful AFS properties is made: efficiency and competitiveness. In addition, ten distinguished triangles — the fields of interaction of multiple functions. This technique of logical and graphical modeling helps to structure the problem of multi-functionality in the analysis of AFS, to produce forecasts of its development, as well as to support the agricultural and food policy in compliance with the principle of multifunctionality of AFS.

The major component of the theoretical concept of multifunctionality of AFS should be the unit of research and risk management inside the agri-food sector. It is known that the risks to socio-economic and ecological systems are associated with the uncertainty of the external environment and internal factors that cannot get the anticipated results, it leads to loss of resources, causing crisis in their long-term and short-term consequences. The implementation of each function of AFS is associated with certain types of risks. They can be called functional risks.

The economic function is characterized by the production risks, reflecting the impact of weather on the results of production and costs, price risks, financial risks etc.

When performing the social function, dangerous are the risks of population decline and disappearance of rural communities, the risks of under-funding of social infrastructure, rural unemployment risks, downside risks to the health of rural residents under the influence of alcohol etc.

For the environmental features, characteristic are the risks of soil fertility loss of agricultural land, the risks of violation of the conditions of water use in industrial and social spheres, disorders and loss of agricultural landscapes etc.

While running the innovative function, one runs into the risk of not getting the desired results of scientific research, the risks of innovation projects realization, the risks of under-funding of research engineering, research and development, testing and evaluation.

For the informational function, characteristic are the risks of false or distorted information, risks of inadequate methods of processing and interpreting the results, risk of technical failures in information systems etc.

It can be assumed that under the influence of different combinations of these functional forms, a kind of integrated risk is formed, which is inherent to the multifunctional nature of AFS. Managing functional and integral risks is a super problem. At the moment science is only in anticipation of awareness and setting this goal.

## **2. Results and problems of practical implementation of AFS multifunctionality**

Of the huge number of multifunctionality problems we will distinguish three, which are characterized by the peculiar intertwining of two or more functions and formation of a «critical nodes». These are some analogues of cancer formation in humans. In each case it is necessary to provide indicators of the presence of the node, the reasons for its formation, the threats and consequences of its sprawl (a kind of metastases), and possible ways to overcome it (healing).

First node — low competitiveness of agricultural production and its products.

Second node — social unattractiveness of rural life in many parts of the country.

Third node — gradual loss of irreplaceable natural and main production resource — arable land.

***Low competitiveness of agricultural production and its products.*** The first indicator of the low competitiveness of Russian agriculture in the global market are small volumes of production and lack of positive changes over the last decade. Even in good years the share of Russia in the global market did not exceed 1.5%. The only exception is the export of grain, which has grown in recent years to 16 million tons.

The second indicator — saving for a few decades a significant amount of imported food products in the consumption structure of population. For example, the share of imports of meat consumption reaches 60% in large cities. In general, the food system imports more than 35%.

The third indicator is maintaining or even increasing the number of agricultural enterprises with low profitability of production. Price ratio of industrial products, acquired by agriculture and the products produced and sold agricultural sector, are added to the constant financial losses of agriculture.

The roots of reasons caused the formation of this critical knot, go to the last decades of the last century, and lie in the deep foundations of the former socio-economic system. Agriculture at the start of the 1990s did not have the adaptive capacity to be embedded in a tough market system. In addition, agricultural policy until 2000 was not conducive to creation and directly led to the loss of such capacity. It is sufficient to mention these three indicators: in 2000 compared with 1990 output of the agricultural sector at constant prices decreased by 2; cattle — by 47.9%, the number of tractors — by 1.4 times. We have to admit that the Russian agrarian reform of the 1990s has not led to the unleashing of a critical knot in the agrarian economy and tightened it even tighter.

Threats and consequences of the low competitiveness of Russian AFS are: loss or significant reduction in food security, deformation of inter-sectoral structure of the economy, weakening of the reproductive potential of AFS. These threats become even more dramatic shades in a worsening global financial crisis.

However, we should take into account not only the threats but also the objective competitive advantages of the Russian agriculture. These are: better than in many other countries availability of land resources, especially the most valuable of them — the black soil and water resources. An important factor is the natural diversity of agricultural zones from north to south and from east to west. Natural-climatic zoning helps to compensate crop losses

due to extreme weather events in some areas due to high yields in favourable weather conditions of other areas.

There is no doubt that use of the competitive advantages of natural-climatic nature requires long-term agri-food policy, which would have been able to reflect the multifunctional nature of AFS.

Attempts to develop such an agricultural policy have been made in the new century through the implementation of the Priority National Program «The development of agriculture» (2005). The adoption of the Federal Law «On the Development of Agriculture» (2006), and especially the «State Program of development of agriculture and market regulation of agricultural products, raw materials and food for 2008-2012» (2007) should be evaluated positively.

***Social unattractiveness of rural life in many parts of the country.*** It is known that the rural population in Russia in 2000 amounted to 39.2 million people (27%) of the total population. In 2008, the rural population was 38.2 million people (27%) of the Russian Federation.

As an indicator of the unattractiveness of the social conditions of rural life can be considered the low level of provision of health services, education, culture, and consumer services. During the reforms of the 1990s for rural employment opportunities have deteriorated considerably, especially in the regions of apparent collapse of agricultural production. Currently, the overall rural unemployment is 12%, and in some areas — even more than 30% (SFD autonomous republics). The excess of deaths over births in 2006 was 1.53 times (in the city — 1.44 times).

The reasons for the critical node in the social structure of the multifunctional AFS are urbanization of the population of the USSR and the residual principle of financing of social infrastructure in rural areas, in which the crisis of the 90s dealt with a fatal blow. The few cultural objects (clubs, libraries), and sports facilities in rural areas ceased to exist. There has been a washout of specialists in agriculture and the inevitable loss of productive capacity of agricultural organizations.

Impacts and threats to social unattractive conditions of rural life are the following: deformation of demographic structure of the village and violation of reproduction capacity of the population, reducing health and overall quality of life, growth deficiency, and even professional workers of mass trades (tractor, combine, milkmaids). The process of mass extinction of villages due to migration of youth and

the extinction of the older generation continued. Percentage of population living below the poverty line is 44.3%, exceeding the critical level by 4.4 times, such an excess by 2.5 times is in the cities [6].

Measures to mitigate and overcome this critical situation are related, primarily, with an increase in the level and stability of income of rural families through better employment in the agricultural and other types of production in the countryside. There remains a scope to increase income from private farming by using various forms of cooperation for the realization of products and lending. The social infrastructure of the village can be significantly improved through targeted funding of regional programs with the support of the federal budget. The current federal program «Social development of village till 2012» has had little impact so far to address the complex restructuring of rural areas. It is unlikely that the remaining four years of this program, the inevitable reduction of funding will provide positive results.

***Gradual loss of irreplaceable natural and main production resource — arable land.*** An indicator of the critical node is the reduction of agricultural use (and in the first place — arable) land. Only in 2007 700 thousand hectares of arable land were converted to other land. From a total of 122 million hectares of arable land is not actually used about 30 million hectares. One of the indicators is also reduction of soil fertility and degradation of land reclamation systems.

The reasons for the negative processes are discontinuation of a large number of agricultural organizations, farmers, degradation of arable land and bringing them into the category of reserve land, hayfields and pastures, the actual termination of the 1990-ies of financing large-scale land reclamation of agricultural land, worsening agricultural technology, and reduction of organic and mineral fertilizers.

Possible consequences are: loss of the main competitive advantage of Russia — a relatively high level of arable land provision (0.83 hectares per capita while in the world average — 0.2 ha) and reduced levels of food security. Consequences will be even more unattractive for the living conditions in rural areas, increased social tensions and stagnating production.

Ways to overcome are the following: attempts to solve the problem of land management were undertaken in 2001, currently the state program «Preservation and restoration of soil fertility of agricultural land and agricultural land as a national herit-

age of Russia, 2006–2010». However, the size and order of its financing is not provided until the desired result. At the present time there must be a substantial increase in funding for the maintenance of soil fertility by major area of agricultural production due to the federal budget and budgets of the Federation, through income profitable enterprises and private investors. Action is needed to reduce the tax burden and provide concessional lending to the agricultural organizations that implement projects for the reclamation of agricultural land for the return of turnover in arable land and ensure its effective use.

Thus, even in the case of three critical nodes of tension, interaction of different functions of AFS can be traced. An understanding of both positive and possibly negative effects of private (functional) effects on the integrated effect of multifunctionality of AFS will better justify the measures of state agricultural policy and develop strategy for AFS countries, regions and individual agricultural organizations.

### **3. Possible research directions for improving multifunctionality of the AFS and further developing the agricultural policy**

We must admit that some positive steps in the agrarian policy of Russia for the past four years have not led to the expected system outcome. Meanwhile, during these years there have been favorable weather conditions and macro-financial state of the country. Wave of the global financial crisis swept Russia in late 2008, complicating the agrarian policy, which should reflect the multifunctional nature of the features of agriculture and all AFS [6]. However, new developments do not diminish, but increase demand for scientific support of the processes of survival of agriculture, conservation and the incrementation of its capacity. This fully applies to the problems of its multifunctional character too.

What are the research areas and methods of their conduction which from now on have extra significance and urgency?

It should be assumed that the nature of multifunctionality has specific content and specific forms in each region. It all depends on geographical location, climatic conditions, population, national traditions, economic structure, state of rural social infrastructure, the availability of competitive advantage for regional AFS domestic food market and access to foreign markets.

To develop a differentiated agricultural policy at the federal level, it is necessary to have a kind of

«multifunctional portrait» of the AFS in federal districts and subjects of the Federation. A similar problem arises for the regional level in relation to district systems. Of course, such studies are underway for several years, particularly by the regional agro-economic institutions and agricultural academies [1, 2, 4, 5]. The results of research carried out by the Ural Agricultural Academy and Institute of Economics, Ural Branch of RAS in the Ural Federal District, in the Sverdlovsk region and others in this district, are known. Fruitful was the cooperation between the Volga Federal District Institute of Agrarian Problems of RAS and the Institute for Agricultural Economics Agricultural Sciences. Similar research tandems were formed in other federal districts. Scientific organizations have accumulated rich analytical material, developed and implemented a variety of research methodologies. Unfortunately, their synthesis and consolidation is almost non-existent. Another drawback is that each institution has too large thematic differentiation (by area and by industry, by type of agricultural production, by types of organizations, individual control functions, etc.). Clearly inadequate is the current state of methodological integration of research needed to study the nature of the regional versatility of the APS. This negatively affects the development of state support for agriculture, long-term forecasts and five-year regional development programs, agriculture and regulation of food markets.

The question arises: should we do to develop an integrative component in the context of studying the multifunctional nature of national and regional AFS at all? If this is necessary in principle, what is the logical sequence of such researches?

The first question can be answered positively. The so-called integrative component opens up the possibility to objectively assess the state of AFS of the country and the regions in terms of internal balance of their functions. A more reliable basis of allocation of scarce budget resources appears to support the agrarian sector and in the stable, and in a crisis conditions.

The second question can also be answered affirmative. There are methods of integrated assessment of the object. An example would be the work carried out within the framework of monitoring the state of social and labour sphere of the village. On the basis of seven indicators, weighted according to their significance, there was a summary assessment of the situation and the causes of most concern in the social life of the village given [6].

Integral assessment of multifunctionality of the AFS can be represented by a system of foreseeable qualitative and quantitative indicators (characteristics), reflecting the implementation of all five functions of AFS of the country and regions.

At present, IAPI elaborates the technique of integral assessment of the level of multifunctional development of AFS. The key point of this technique is to measure the extent to which some reasonable standards for each function based on statistical data and expert estimates based specialists are now. Experimental verification of the methodology will be conducted in the second half of 2009 on the materials of AFS in three federal districts — Central, Southern and Ural. In each of these districts of the

Federation, two subjects with a relatively high and relatively low levels of AFS were allocated.

In conclusion, it should be noted that the highest integral criterion of agri-food sector performance of its functions is food security. An essential element of the institutional framework is the doctrine of the food security of the Russian Federation. «This document is a collection of official views on the goals, objectives, principles, guidelines and mechanisms for public policies to ensure food security of the country» [7, p. 3]. A practical implementation of the Doctrine to a large extent will depend on the level of scientific development, including problems of multifunctionality of the agri-food sector.

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