

# Innovations in Serbian Agribusiness Management

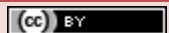
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## Abstract

The focus of this paper is to study the desirable structure, the key issues and the preferred method of transformation of scientific innovation system in the revitalization of the agricultural development functions of industry and agribusiness in Serbia's autonomous region of the Autonomous Province of Vojvodina (APV), in accordance with the current European concept of re-industrialization. Three operational conclusions are drawn: The concept of operationalization strategy of structural adjustment of the innovation system as a function of agribusiness in the APV is based on the system integration of the learning and cooperative co-operation, induced from the mass, and the majority of informal communication. Second: main task of the innovation system is to initiate projects for development of economically self-sustaining farm, encouraging the restructuring of production, technological, organizational and staffing structure of the agro-industrial complex. Third, the operationalization of the specific strategy of the structural adjustment of the innovation system as a function of agribusiness in the APV should be reduced to: projects of transformation of the institutes in high-tech enterprises, promotion of new models for innovation development planning at the university, independent institutes and production enterprises, and the promotion of more efficient models of regulating relations

**Keywords:** Innovation system, Reindustrialization, Agribusiness, AP Vojvodina.



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## 1. Introduction

The focus of this paper is to study the desirable structure, the key issues and the preferred method of transformation of scientific innovation system<sup>1</sup> in the revitalization of the agricultural development functions of industry and agribusiness in Autonomous Province of Vojvodina (APV), in accordance with the current European concept of re-industrialization. In APV during the 1957-1970, with technical assistance from FAO and the United States, a strong and efficient innovation system was built. In the eighth decade of the last century the APV was at the highest technological level and competitiveness in agricultural production and processing industry in relation to the agricultural industry of all other European (now, former) socialist countries. However, around 1980, its development was blocked, and the production of knowledge and the transfer into products and processes in a way that benefits both the innovator and the user came to a halt.

At first glance, the current state of the innovation system for the agricultural industry in the APV in terms of resources: the number and structure of the organization for education and research, the number and structure of teachers, scholars and researchers, available space, and experimental farms and to some extent the equipment - according to many its dimensions is quite respectable, and almost entirely owned by the state and with the effectiveness in par with other local public and (unfortunately) most commercial organizations. However, the institutional arrangement that supports this system is far from providing a modernization role in the economic preparation of Serbia and the APV for the European integration, despite the multitude of (politically) properly designed national and regional educational, scientific, technological, agricultural and industrial policies, including the implementation of the project of privatization and institutional reforms in the past decade [1, 2]. In this context, the innovation system in the agricultural industry of the APV, in the strict scientific sense does not exist, because there is no innovation (in terms of net benefits innovator, a new value to - note of the author) system. The prolonged absence of developmental effectiveness of regional innovation system is a key explanation for developmental delay in the APV<sup>2</sup>.

In scientific terms, the structure of the innovation system consist of: (1) organizational and functional distribution of innovation potential, (2) the rules of defining the program for the development and valorization of innovation and the allocation of necessary resources, (3) the criteria used to determine the internal organization and conduct of Innovation system, and (4) a system of values and base rules for the evaluation of programs, policies and innovation results. In this context, the desirable structure of the regional innovation system can be determined based on the possibilities of achieving the required technological development of the agricultural industry in the APV during the next ten to fifteen years as a function of its real integration into the (European) market environment. In this sense, the projection of the goals and dynamics of transformation of the regional agricultural industry in market-oriented production system can be defined as a standard (norm) for the synthesis of the structure of the innovation system. On the other hand, the boundary conditions, i.e., the most likely state of the basic attributes of the agricultural industry in the APV and its external and internal environment provides the framework to be respected by the structure of the innovation system.

In this context, the first part identifies the key trends of technological development in the European agricultural sector and their implications for the structuring of the regional innovation system. The second part deals with the problem of determining the framework and standards for constituting the preferred structure of the innovation system for the agricultural industry in the APV. The third part deals with the structural characteristics and the necessary changes in the innovation system in the APV, in order to obtain a state of well-functioning and the ability to effectively expand reproduction potential of the regional agricultural industry.

## 2. Characteristics of Technological Development in the Agricultural Sector

The analysis of the development trends of European agricultural industry [3-6] was done in accordance with the following criterion: To what extent and how does the technological development in the European environment modify the probability that the available potential in the agricultural sector in the APV would be transformed into a real development opportunity? The basic assumption is that the development of the European agricultural industry would follow the global technological trajectory. This means that it will prefer technologies that significantly valorize some natural resources and skilled labor, while reducing dependence on natural resources, such that the dominant importance of quantity will gradually be replaced by: quality of work, production, and life. The following key development trends in European agricultural industry are identified [6]; [4, 5] First, technological developments will continue to play a fundamental role in the transformation of the agricultural industry in all member states of the EU. The most important role in next ten to fifteen years will have: sophisticated machinery farm production, biotechnology and information technology. The typical farm will increase in size, intensifying the process of strengthening its ties with the whole agricultural industry while decreasing the role of human labor. The main

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<sup>1</sup> Innovation system is defined as a socio-economic superstructure which deals with the training of personnel for work and during work, as well as with all the activities involved in the gathering and processing of information and on this basis on the production of knowledge and its transformation into products and services in a manner that benefits the innovator and creates a new value to the user (in this case for the purposes of industry agrarian note of the author). In this context, the innovation system encompasses: Science - Technology - Information - Education (Secondary - specialist and vocational, higher education, to develop their knowledge and skills while working) and Organization (micro, medium and macro-organization of economic and non-economic activities and actors on the basis of analysis of their behavior in structured networks to the realization of the activities of the public regulation of the economy and economic development, ie, implementation of specific business activities and the provision of public goods and services, public administration). In the innovation system are included and Communications (in the broadest sense - mail, fixed telephony, mobile telephony, computer networks, data and information, dedicated indoor and outdoor telecommunication systems, informal communication network for the exchange of information between entrepreneurs, managers, professionals, professional teams, open and private networks for the transmission of video and voice, etc.).

<sup>2</sup> In assessing the actual production and technological scope of the agricultural industry in the APV, one can compare the next best European achievements (the Netherlands, Denmark, the northern region of France), or to take the other, more appropriate development framework. Thus, in the APV, according to the calculations of the author, in the case of reaching the productivity factor of Chinese agriculture, it is expected to produce nearly one million tons of meat and fish, or five times more than current production, which is in contrast to China, where it continuously decreases for more than two decades (meat from the 293,000 t in 1990 to 196,000 t in 2009, while fish production (despite the huge potential opportunities for high-quality and low-cost production) stagnated at the level achieved in 1990 by about 6,500 t).

problem facing the APV is to find solutions for the transition from traditional production based on natural and human resources to an information-based manufacturing process.

Second, the long-term demand for food in the European market will grow very slowly, except in cases excessive climatic disturbances and their implications for the production and supply of raw materials. There will be a further segmentation of the food market due to attention paid to diet and health. This will have a very clear impact on the role and development of high quality technologies. The trend of dynamic increase in the consumption of fresh food continues, a slight increase in consumption of frozen foods and the reduce in consumption of canned food. In line with these trends the development of new technologies to storing food will intensify. The trend of reducing the use of fertilizers, chemical sprays, synthetic additives, colors and spices, and growth in the use of natural or biotechnological derived fertilizers, plant protection, food additives, colors and spices also continues. The common underlying implication is the need to develop entirely new organizational forms in the reproduction chain and very expensive physical infrastructure. This will have three economic and developmental consequences. Increase in production costs due to the implementation of new and expensive technologies will reduce the overall profitability of food production. This will particularly affect producers of raw materials, including the APV. The application of highly sophisticated technology implies a risk of reduced freedom for Serbia and the APV to access the European food market due to very poor organization of agricultural industries and low internal investment capabilities. Finally, the import of high-quality, clean, diet and healthy food for home consumption will intensify (since the redistribution of social and economic power within Serbia and the APV in the last twelve years had elapsed adequate demand).

Third: in a relatively short period of time to expect complete removal of market barriers for food within Europe. At the same time, remains a problem: Is there going to be and when and how to eliminate barriers to the outside world? In any case, all European countries, including Serbia and the APV are faced with a problem: How to support the technological change (conversion) agro-industrial complex in a manner that will ensure the improvement of the external and internal competitiveness efficient valorization of natural and man-made resources?

Fourth: global and European trends of reducing employment in the agricultural industry are due to the development and application of new technologies continues. The specificity of this problem for Serbia and AP the APV is the fact that in the past two decades there has been a radical deindustrialization, leading to the decrease in number of employed so that in 2012 the number dropped to about 45% of the working population. According to estimates, approximately one-third of the working population in the APV does not have a permanent job. Political and social consequences of this condition are partially offset by the fact that part of the population produces food on their small estates, or is seasonally employed (without taxes and social and health insurance at work - note authors).

In addition to these implications for the technological development of the agricultural industry in the APV, which has its origin in the trends in the European environment, we should note some key external and internal implications for which we must seek an appropriate solution by developing new technologies and business and organizational innovation.

Fifth: we should find a specific organizational and technological solutions (in the form of business, organizational, and technological innovation - note of the author) for: (1) low valuation of basic resources (land, labor, and basic machinery) compared to the former pre-transition peaks, (2) degradation of land, resource depletion and environmental pollution that has occurred over the past twenty years, (3) greater investment in anti-contamination of raw materials and (4) increased investment in maintenance materials before delivering to the outside markets [4], [5], [7]. Therefore, one of the key tasks of the innovation system is to find a solution to neutralize the effects arising from the fact that poor use of resources in the APV is followed by growth of other elements and costs which threaten, that despite the low price of basic resources, push the production costs of raw materials and primary products up on the domestic and European markets.

Sixth: the way and time frame in which to conduct the preparation of the APV and Serbia for European integration generate specific development problems. Involvement in the European integration process creates opportunities for growth in food exports (with higher newly created value per unit of product) from the AP of the APV, meeting the needs in terms of: (1) exclusivity, (2) nature, (3) diet, and (4) health. These segments of the food, the task is almost there, but it is certain that they could be in the APV. These segments occur with implementation of food export policies at a high price, which can be achieved only by using business, organizational, and technological innovation. The key problem is that historical experience suggests that the development of the agricultural industry based on knowledge, which is a necessary prerequisite for this orientation in Serbia and the APV, in the past thirty years was at least three times promoted, yet its implementation was never initiated.

Seventh: current and expected impact of technological development in the agricultural sector is extremely diverse, ranging from the incremental improvement of existing technologies and the development and implementation of a completely new advanced technologies. Therefore, the technological development of the European agricultural industry is a mixture of: (1) independent activities of individual producers, (2) the policy of their mutual association on a case basis, (3) the activities of multinational corporations and international companies, and in that respect, foreign direct investment, and (4) organized action of government and regional administrations. The specificity of Serbia and the APV is that the role of government in technology and development is dominant, because national and regional governments directly control 96 to 99% of its human and financial resources - and in these circumstances there is neither basic mechanism for realistic evaluation of innovation nor for their efficient transformation into processes, products and income.

## **2.1. Frameworks and Standards for the Constitution of the Preferred Structure of the Innovation System for the Development of Agribusiness in the APV**

There are many ways to express the development of innovative systems for agribusiness: desirable, possible, standardized, expected and predicted. We have chosen the first approach, so that the goals, objectives, aspirations and ways of implementation are presented using necessary and feasible structural changes in the agricultural industry in the next ten to fifteen years. Obsolescence of the existing structure of agricultural industry in the APV is obvious,

and the changes in this structure should be preceding transformations innovation system. It stems that the target structure of the agricultural industry should be the standard for determining the structure of the innovation system. In this context, it is necessary to determine the boundary conditions, i.e., the most likely state of the basic attributes of the agricultural industry in the APV, as a framework for the new structure of the innovation system. The following boundary conditions can be specified:

First, consistently accepting and implementing the view that the APV (despite the large renewable natural resources) has no natural or work accumulated comparative advantages sufficient to compensate for the lack of adequate technology, business and organizational development of the agricultural industry<sup>3</sup>.

Second, the change of organizational, industrial and business structure of agricultural industry in the APV should be accomplished in two phases. During the first phase, which would coincide with institutionally regulated process of preparing for European integrations, to intensify the use of existing innovative potential and provide their own reservoirs to perform the second phase in which the structural changes should be made, primarily by investing in modern equipment and improving infrastructure for the process of reproduction comparable to the highest European and global standards.

Third, economic participants in the agricultural industry will receive part of the input signals from the market, on which the economic evaluation of their results would be carried out. The national economy will become the market in modern (European) sense. Unfortunately, after twenty-two years since the restoration of capitalism and twelve years of reformed model on the target environment, the Republic of Serbia and the APV are far from the realization of the project of constitution of an open market economy. A key reason for the slow development of an open market economy is the fact that the restructuring of the economy, after the restoration of capitalism in the first stage of the transition (from 1990 to the end of 2000), took place in the framework of the gray economy. After the radical political changes in late 2000, their key protagonists have legalized its businesses and properties, resulting in the closure of the market to other participants in the market competition. Therefore, the spillover effects of the first wave of the global financial and economic crisis in the Republic of Serbia and the APV, among others, showed that amnesty protagonists of the informal economy are not able to fulfill the primary mission of the entrepreneurial class: that shifting horizons of personal progress shifts the society as a whole. Key consequences are the low level of institutional capacity and investment myopia, which are particularly affected manufacturing and primary agricultural production.

Fourth, national and regional governments will be able to develop activities and responsibilities for the development of the agricultural industry based on knowledge in a way that it benefits the innovator, and creates a new value to the user.

Fifth, at the beginning of the next decade, the Republic of Serbia will become a full member of the European Union. This means that many of the structural reforms and adjustments in the regional agricultural industry and its internal and external environment will be executed in a relatively short period of time, and will in return receive a reduction in barriers to access markets.

Sixth, the development of the European agricultural industry in the next ten to fifteen years will continue to follow the well-known global technological trajectory, which is described in detail in the previous section. This means that there is a negligible probability that in the observed period (up to 2020/2025. Was) there would come to the abandonment of the dominant techno-economic style.

Finally, two key findings of the innovation process, which should find its place in the new structure the innovation system for agribusiness, will be presented:

First and foremost is that the innovation is a specific and appropriated knowledge and not freely available information. Innovation occurs primarily as a result of beliefs and economic development of a motivated businessmen to research, develop and commercialize the products and a new business (manufacturing, purchasing, marketing, sales, service, etc.) of the process to achieve economic benefit administered, which will compensate for the investment in the innovation process and improve its conditions for the development and performance of the market. However, that is not enough: innovations occur when there is a sufficient knowledge base and economic and technological capabilities of the trajectory on which the requested certain innovations exist. This means that the knowledge base includes production experience and various specific internal knowledge and skills, which are difficult to codify and transfer. Therefore, for the success of the innovation process is necessary and specific knowledge and skills of a particular manufacturer. The key implication for the development strategy of the new structure for the agricultural industry in the APV is to actively work on developing an environment in which an effective structure for creating innovation infrastructure with the relationship between the public and private factors should not be everything to nothing, as it is today, but at least 1: 1, and more preferably 1: 2 in favor of the market participants.

The second is that the restrictions on the provision of innovation from the outside world are massive. Transfer costs of innovation, difficulties in communication between donor and recipient of the innovation, misunderstanding technological and economic essence of innovation and the like, represent a great danger, and the transfer of innovation is best done by staff takeover, since the part of the innovation embedded in employees is difficult to codify. But on the other hand, a proper understanding of these issues is a powerful development opportunity. The main implication is that the infrastructure for the diffusion has the same importance as the infrastructure for the creation of innovation and the relationship between the public and private factors in its formation must be a minimum of 3: 1 in favor of the latter.

<sup>3</sup> For the analysis of the success of implementation of the strategy of restructuring the innovation system in the revitalization and improvement of competitiveness of the agricultural industry in the APV, one should explicitly define the standards for evaluation of results in light of the aforementioned limitations, on the dynamics of demand and structuring non-commercial and commercial conditions for placement in the European food market. In this context, in the first phase, the main task for the innovation system is to create the conditions for renewal of production (but with a structure adapted to the new market conditions - which basically means that in this period one should increase the export of agro-industrial complex in the APV two times to the current level in a very uncertain market conditions) to the pre-transition peak (which is in the APV achieved in 1986). Accordingly, it seems to be expedient to propose to achieve that goal by the end of the preparation of the Republic of Serbia for European integration which can be determined in 2020/21. Year.

A short synthesis of the implications of the above analysis for the determination of the framework and standards for the constitution of the preferred structure of the innovation system for agribusiness is a treat of every great innovation system and that is why this system must be carefully studied. In this context, a legitimate public policy action should act towards structuring the innovation system on the principles of self-reproduction, and direct placement into operation of revitalization and improvement of the competitiveness of the agricultural industry in the APV towards the (European) open market economy criteria. It is absolutely certain, without further elaboration, that the revitalization and improvement of the competitiveness of the process, product, and (economic) participants in the regional agricultural industry ultimately comes down to the process of global commercialization through the acquisition and conservation of competitiveness based on the dynamic creation and the development of: (1) economically self-sustaining agricultural farms, cooperatives, manufacturing and transport companies consolidated export macro-clusters are organized by main lines of production (wheat, corn, sugar, oil, bio-diesel, milk, pork, poultry and beef with features health and natural foods) in a manner that provides economic and technologically efficient operation in terms of high rigidity imposed by new models of food consumption, on one hand, and protectionist-oriented agricultural policy in the external environment on the other, and (2) adequate market infrastructure and specialized circles of commercial and financial capital, whose main source of financing the profit is food production for export, followed by a set of projects for rehabilitation, upgrading and new construction of specialized physical, scientific and educational infrastructure and infrastructure for public regulation - whose main task of the public and private logistics, R&D, educational, administrative and similar activities provide incentives (and relatively stable) conditions for smooth process of expanded reproduction of the aforementioned production lines with the lowest possible cost [3, 7].

## **2.2. Structural Characteristics and the Necessary Changes in the Innovation System**

In considering the problem of structural features and the necessary changes in the innovation system and their implications for the dynamics and structure of the regional agricultural industry one should take account of specific national factors that hinder this task.

The first are vague objectives of the transition of the real economy in the Republic of Serbia, which resulted in destruction of all major business in agro-industrial system in the APV. But in historical context, they are the result of another crucial factor. It is a phenomenon of a highly non-economic approach to the formation of a model of development, production, processing, marketing and trade. If we eliminate the events in the period 1945 to 1956 which are the result of different specific factors (major destruction in the WWII, food crisis after the war, industrialization, the socialist concept of hypocrisy development of heavy industry at the expense of agriculture, which was *de facto* abandoned in 1952, because of the foreign help, first irreversible, and later in the form of favorable commodity and financial credits), this phenomenon became visible at the end of the seventh decade of the last century, when there was a reduction of the national share of world exports of food, in which the APV had a dominant role, since (as stated) in the period from 1957 to 1960, made the revitalization of the radical qualitative and quantitative improvement of the agricultural industry. The initial impulse is to eliminate the national production of meat and meat products from the EU market by introducing the common agricultural policy (which has hit other countries, such as Argentina, Australia, etc.). The suppression of the principle of economy to the margins and incremental behavior towards structural adjustment have produced sub-optimal use of natural and man-made resources in the regional agricultural industry, major structural technological and production distortions and high costs of its production.

Therefore, the low efficiency of the innovation system servicing agribusiness in the APV should be treated as a derived macroeconomic phenomenon, which is caused by the mismatch between available natural and human resources, manufacturing base and the way their organizations and national socio-economic conditions of their use (which have in the past twenty-two years produced: transitional stagflation, a radical de-industrialization, the great social and political turbulence and institutional chaos) in a rigid outer environment. Therefore, the problem of structural changes in the innovation system and its putting into operation of agribusiness in the APV should be viewed primarily as a project whose main goal is to create a framework for socially organized and institutionally regulated process of cooperative coordination of decisions at the macro level, on the one hand, and medium and micro level, on the other, to development and implementation of in-cite-generated private businesses and technological innovation and the introduction of new forms of social and economic organization and division of labor provided by the global competitiveness of the final product. In this context, if we accept the above framework and the standards (norms) given in Chapter 2. it is possible to determine five crucial changes that should create the conditions for the constitution of a desirable structure of the innovation system for agribusiness.

First: the reallocation of innovation potential. This is a crucial and the most difficult task. Most of the innovation potential should be located within the business entities in the agricultural industry, because only then it can be effective in responding to market signals. The research potential of the University of Novi Sad should be strengthened, and independent institutes should specialize in the long-term educational technologies. In the context of the complete destruction of the innovation potential in production companies in the past 22 years, the initial impulse can only come from institutes either by shifting from research activities to production, or by their transformation into high-tech enterprises. Spontaneous convergence of this model has started more than three decades ago, but was blocked in the middle of the last decade of the last century. There are two problems in the implementation of these ideas,. The first is how to encourage the (existing) institutes to the spontaneous convergence towards this business model within the largely distorted internal institutional and economic systems. The second is to neutralize the distortion that would bring such a spontaneous convergence. This indicates that the focus of intervention should be on measures to supplement the innovation system by creating consulting, transfer, information and other micro-organization, which would actively work to create and develop links between the various participants of the innovation system. These activities should be developed within the University, the institution which will survive the process of spontaneous transformation into a high-tech enterprise.

Second: changes in the system of planning innovation. In a market system, production and transport companies make their own decisions about the development and implementation of programs to generate and valorize an innovation. Natural short duration of these programs is irreparable, i.e. one can't expect the adoption and establishment of the program in the long run. It is not a problem, because in this way remarkable results in the generation and implementation of the so-called incremental innovations related to the improvement of existing processes and products are achieved (of course, when there is an appropriate framework for their encouragement and valuation). Long-term research programs must be defined by top regional research institutions and associates, regional governments and business associations, based on global trends in scientific, technological and structural developments in the global environments. The main objectives of these programs are creating new knowledge bases and their transfer to new organizational forms, technology, business processes and products aimed at improving the competitiveness and competence in the long run. These programs must be strongly connected with international competitive research. It is sufficient to critically examine the model transformation of agro-complex of the APV in the second half of the sixth decade of the last century to find new creative solutions for its implementation in the current state of the structure.

Third: a new model of regulation of relationships and behavior in the innovation system. This requirement is adjacent to the planning problem. Relations and behavior of the innovation system in terms of business entities need to regulate in-cite established criteria in their business and innovation strategy. Market-regulated manufacturers will themselves define criteria for determining its activities related to the generation and implementation of innovations. Behavior and relationships in basic and strategic research needs to regulate the criteria that come from the outside - from the institutions, bodies and organizations involved in their (co)funding.

Fourth: the restructuring of the system of financing innovation system. In accordance with the second and third parameter (planning innovation and editing relationships and behavior in the innovation system) resources to finance innovation venture should be structured on the basis of its purpose. Innovation that arises in response to market needs should be funded solely by manufacturers. Research funding that can't be recognized by the market information (basic and strategic research, new knowledge and pre-competitive research) should be supported by public funds in accordance with the regional economic opportunities to support intentions carefully defined at European and global level. In both cases there must be a solution that would allow overcoming the risks of quest for innovation and diffusion of other people's results (in the form of new organizational forms, technologies, processes and products). Scientific recommendation is the creation of high-risk circles of the (private) capital, followed by specialized regional funds or programs.

Fifth: increasing the efficiency of the model for the evaluation of innovation. Innovations programs that are generated by the market demand are *ex-ante* evaluated because they are defined by marketing, sales, manufacturing and other commercial and technical criteria. Market interactions that exist in generation and implementation of innovation in the enterprise provide evaluation during the process, and the final result (improved or new product or process) validates the market through the promotion of economic efficiency (profits) and increase in market share. For basic research a high quality *ex-post* automatic evaluation (publication of results in internationally recognized scientific journals, indices citations and co-citations, etc.) is needed. The most difficult problem is the evaluation of strategic research. *Ex-ante* evaluation is performed by exploring the needs and feasibility of strategic projects. In this sense, the common institutions of the European Union put together a variety of quality procedures, and provide the possibility of using experts. The objective *ex-ante* evaluation makes it easier (in terms of cost, time and conflict) to perform evaluations in generating innovation, and its *ex-post* evaluation.

A short synthesis of the implications of the above analysis for the determination of changes in the structure of the innovation system for the agribusiness sector in the APV suggests that a spontaneous and controlled variation of five parameters of the existing structure (reallocation of innovation potential, changes in the planning system innovation, the new model of regulation of relationships and behaviors in Innovation system, the restructuring of the system of financing innovation system, increasing the efficiency of the model for the evaluation of innovation) would lead to a state of good functioning over the period of next ten to fifteen years, enabling real integration of regional agricultural industry in the targeted (European) market. Of course this does not exhaust all requests for changes in the parameters of the innovation system (at this point we shall state three: overcoming the problems of obsolescence and slow recovery of the innovation of the population, opening up space for engagement innovation population abroad and overcome the problem of the collapse of human capital performance).

### 3. Conclusion

Necessary conditions for development based on business, technological and organizational innovations in the agricultural sector and the agricultural business in the APV are in poor state. Therefore it is necessary to identify all of the major obstacles and shortcomings and eliminate them. In this context, the above taxonomy represents an attempt of scientific interpretation: What should be done in the field of innovation system to create the basic conditions for the opening of the revitalization process development functions of agricultural industry in the APV and its real involvement in the European food market?

We came to three operational conclusions:

First: the concept of operationalization strategy of structural adjustment of the innovation system as a function of agribusiness in the APV is based on the system integration of the paradigms: learning and cooperative co-operation, induced from the mass, and the majority of informal communication between individuals and businesses that provides for division of labor and specialization based on the flow of information and exchange of experiences necessary for timely and (economically) effective action for the operationalization of individual and group preferences in terms of sharp, open and unequal competition on the European food market.

The second main task of the innovation system is to initiate projects for: (1) the development of economically self-sustaining farm, (2) encouraging the restructuring of production, technological, organizational and staffing

structure of the agro-industrial complex, and (3) the elimination of the impact of distribution-oriented coalitions and their replacement with development-oriented coalitions in primary lines of production (wheat, corn, sugar, oil, bio-diesel, milk, pork, poultry and beef with the characteristics of healthy and natural foods).

Third, the operationalization of the specific strategy of the structural adjustment of the innovation system as a function of agribusiness in the APV should be, due to the state of general institutional disorganization, in the initial period reduced to: (1) projects of transformation of the institutes into high-tech enterprises, (2) promotion of new models for innovation development planning at the university, independent institutes and production enterprises, and (3) the promotion of more efficient models of regulating relations, conduct and evaluation of the results of the innovation system based on increasing the competitiveness of products and processes and quality improvement in order to increase exports. In this context, the main activities of the public factors should be limited to: (4) intensification of the process of modernization of the infrastructure for the provision of public goods and public administration services for the agro-industrial complex in accordance with best European models, (5) supporting the development of productive entrepreneurship and human capital through various forms of cooperation between public and private sectors, and (6) the rehabilitation and modernization of transport infrastructure with a complex macro-bases and border crossings in service of creating the conditions for economic and technical rational food exports.

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