

## Improvement of Agricultural Machinery Economic Efficiency

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**Abstract:** This study deals with the analysis of current support for Russian manufacturers of agricultural commodities. Major functions of the Machine-Technological Stations (MTS) have been studied. We proposed an attempt to create MTS of such legal structure as an agricultural production cooperative founded under participation of agricultural manufacturers on the basis of share interest in the production process. There with the MTS shall be deemed to be an agricultural organization when buying equipment, obtaining loans and granting subsidies. The MTS development requires further improvement therefore, it is necessary to define the areas where high productivity and good performance quality can be achieved. Formation and development of the agricultural machine-building cluster has been considered as one of the most effective, modern forms of economic efficiency improvement, production modernization and increase and creation of new jobs in the agricultural machinery market. The development of the construction algorithm for agricultural machine-building cluster involved a nuanced analysis of the RF Government Decree of 31.07.2015 No.779 "On industrial clusters and purpose-built organizations of industrial clusters" (as well as the "Requirements for industrial clusters and purpose-built organizations of industrial clusters for the purpose of applying there to the incentives for activities in the industrial sector", "Rules of assessing the conformity of industrial clusters and purpose-built organizations of the industrial cluster to the requirements for industrial clusters and purpose-built organizations of industrial clusters with a view to applying there to the incentives for activities in the industrial sector"). The scheme of the formation stages of the agricultural machinery cluster has been suggested. The scheme of both internal and external boundary of the agricultural machinery cluster has been provided.

**Key words:** The machine-technological stations, subsidies, agreement on establishment of the set of agriculture machine-building entities, agriculture machine building cluster, strategic planning group, advisory board, project committee

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### INTRODUCTION

Improving the efficiency of agricultural enterprises through the use of agricultural machinery in a difficult financial situation is only possible with the state support and the joint efforts of several companies.

The Ministry of Agriculture and Food of the Russian Federation distinguish today five areas of supporting the Russian agricultural manufacturers: first and major area is the provision of subsidies for partial reimbursement of interest expenses on investment credits. That is the investment credits involve possibility and necessity of the need for the acquisition of agricultural machinery: the second area is leasing; the third area is the provision of subsidies to the manufacturers of domestic and localized agricultural machinery with 15% cost compensation there to: the fourth area is subsidizing a part of costs of agricultural producers for the purchase of equipment from the constituent entities of the Russian Federation. Total 39 constituent entities fall within the scope of the regional programs of subsidizing from regional budgets. There are regions (for example, Tatarstan) subsidizing 2 billion

rubles per year from their own budget. The Ministry proposes co-financing of the economically relevant regional programs from the federal budget, applying the mechanisms that would promote the purchase of domestic, localized agricultural machinery; the fifth area is the further implementation of purpose-oriented programs "Support for new farmers" and "Development of family-operated livestock farms based on peasant farms").

### MATERIALS AND METHODS

Measures taken by the government for supporting the domestic agriculture machinery manufacturers and involving an increase in duty up to 15% on Foreign equipment and the issuance of loans for the purchase of domestic agricultural machinery have positively influenced this industry.

However, the fact of direct subsidizing of Foreign agricultural machinery from the regional budgets has caused no positive reaction in the RF government. Dmitry Medvedev called for "less liberal" treatment to those regions that subsidize Foreigners.

Currently, 30 constituent entities of the Russian Federation subsidize directly the purchase of imported agricultural machinery, by virtue whereof it was proposed to set the priority for the purchase of Russian equipment and develop a unified system of measures of state support for the Russian manufacturers when carrying out procurement on leasing programs.

However, even having the state support in the form of subsidies and loans, many agricultural manufacturers cannot afford the equipment, some of which will be used only in sowing and harvesting periods. There is a question arising in this regard of joining forces between the enterprises to carry out a series of mechanized operations.

## **RESULTS AND DISCUSSION**

Machine-Technological Stations (MTS) can provide technical assistance in mechanized operations. In the early 90s, the MTSs were created everywhere however, their number was gradually decreasing due to multiple unsettled financial problems. MTSs were created in Russia as commercial enterprises. In this regard, the cost of services was greatly overestimated and was much more expensive than the same mechanized operations done by own efforts.

We studied a range of MTSs in Tatarstan (OJSC Tyulyachi nothing machine-technological nothingstation", LLC Bulgarian "machine-technological nothingstation", OJSC "Buinsk machine-technological nothingstation", "Machine-technological nothingstation" Verkhneuslonsky District, OJSC "Yelabuga nothingmachine-technological nothingstation", LLC "Vysokogorsk nothingmachine-technological nothingstation") and in Ulyanovsk region (LLC "Maysk nothingmachine-technological nothing station", Agricultural Cooperative (AC) "Surskoe nothingmachine-technological nothing station"). As a result, we revealed that the main functions of MTSs reduce to the provision of services in mounting, repairing and maintaining the agricultural machinery, including wheeled tractors and the forestry machinery as well as trading therewith.

Meanwhile, Foreign countries have practiced the establishment of associations of agricultural manufacturers for machinery shared use. That is the provision of machinery and equipment as well as skilled personnel which allows companies to optimize their costs for equipment and repair as well as provides an Russia at a new level. For this purpose, such legal structure shall be used as an agricultural production cooperative founded under participation of agricultural manufacturers on the

opportunity of applying modern technology and new operational methods. This experience can be used for MTSs creation in basis of share interest in the production process. Therewith, the MTS shall be deemed an agricultural organization when buying equipment, obtaining loans and granting subsidies.

The established MTSs shall expand a range of services provided to avoid downtime in winter period when the amount of research decreases sharply. A positive aspect thereof is the ability to set lower prices for services and high utilization rate of the machinery. Therefore, it is possible to provide services for both agricultural, municipal and road services.

The MTS development requires further improvement; therefore, it is necessary to define the areas where high productivity and good performance quality can be achieved (Lialin, 2012).

Formation and development of the agricultural machine-building cluster is one of the most effective, modern forms of economic efficiency improvement, production modernization and increase and creation of new jobs in the agricultural machinery market.

The term "cluster" was introduced into scientific use in the 60s of the last century to identify the groups (clusters) of very similar objects for the purpose of their classification. Professor of Harvard School of Economics, Michael Porter is considered the founder of the cluster theory. In his opinion, the traditional division of the economy into sectors or branches has lost its relevance in terms of globalization. Clusters have taken center stage. M. Porter identified a cluster as a group of geographically adjacent, interconnected companies and organizations operating in a particular area, characterized by common activities and complementing each other (Salakhova, 2009a, b).

Establishing a cluster in terms of import phase-out helps entrepreneurs to enter new markets, minimize the cost of goods and make bulk purchases of raw materials or other products by their joint efforts, thereby reducing costs (Salakhova, 2009a, b; Subaeva and Faizrakhmanov, 2008)

As early as 2011, the president of the Industrial Union "Novoe Sodruzhestvo", president of the agricultural machinery manufacturers association "Rosagromash", member of the General Council of the All-Russian public organization "Business Russia" Konstantin Babkin advanced the initiative of the establishment of agricultural machine-building cluster in the regions of Russia. There is no operating agricultural machine-building cluster in the Volga regions.

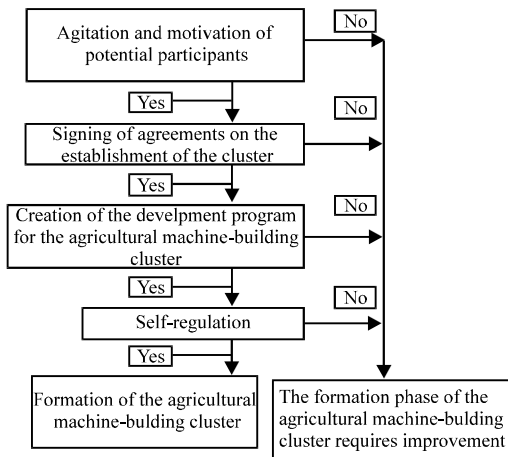


Fig. 1: Agricultural machine-building cluster establishment scheme

Systematizing a vast scientific material by clusters' activity allowed us to develop a scheme of formation stages of the agricultural machine-building cluster (Fig. 1).

In accordance with this provision, we shall but reveal a solution algorithm shown in Fig. 1. The solution algorithm presented in the scheme includes five steps:

- Agitation and motivation of potential participants
- Signing of agreements on the establishment of the cluster
- Creation of the development program for the agricultural machine-building cluster
- Self-regulation
- Formation of the agricultural machine-building cluster. We shall consider the main elements of this scheme in more detail

Agitation and motivation of potential participants of the agricultural machine-building cluster. The necessary preconditions for the formation of agricultural machine-building cluster in Tatarstan are an agricultural orientation of the region which is one of those taking the leading position in crop production in Russia. The presence of fertile lands, hayfields and pastures provides an opportunity for the development of all sectors of agribusiness industry and agricultural engineering as well as the development of investment policy and the close correlation between academic, institutional and industry-specific research.

We may involve such leading scientific organizations as KazSAU, Tatar Scientific and Research Institute of Agriculture, Volga Test Station (Samara), Kirov Test Station and Tupolev Kazan National Research Technical

University in the agreement on the establishment of agricultural machine-building cluster. All of them have unique scientific and technical innovations in the field of both agriculture and agricultural machinery.

The development of the construction algorithm for agricultural machine building cluster involved a nuanced analysis of the RF Government Decree of 31.07.2015 No. 779 "On industrial clusters and purpose-built organizations of industrial clusters" (as well as the "Requirements for industrial clusters and purpose-built organizations of industrial clusters for the purpose of applying thereto the incentives for activities in the industrial sector", "Rules of assessing the conformity of industrial cluster to the requirements for industrial clusters and purpose-built organizations of industrial clusters with a view to applying thereto the incentives for activities in the industrial sector") (Anonymous, 2015a).

Considering the enormous importance and quite favorable forecasts for the development of the agricultural sector of Tatarstan, the agricultural machine-building cluster must meet the following requirements: to be established together with the constituent entities in the industrial and agrarian production fields, interrelated in the specified area as a result of territorial affinity and functional relation and located in the territory of either Tatarstan or several constituent entities of the Russian Federation involved in the production of agricultural and industrial products.

At least 50% of total production of each participant of the agricultural machine-building cluster shall be used by its other participants, except for those members of the agricultural machine-building cluster who are involved in the final output for the purpose of its further realization in domestic and Foreign markets. The infrastructure of the agricultural machine-building cluster shall include.

At least one institution of higher professional education (KazSAU, Tatar Scientific and Research Institute of Agriculture and Tupolev Kazan National Research Technical University) and (or) one institution of secondary professional education (G.I. Usmanov Chistopol Agricultural College) providing professional training and (or) further education of member staff of the agricultural machine-building cluster in order to achieve the goal of creating the agricultural machine-building cluster as well as engaged in the development, modernization, selection and debugging of new products and technologies.

At least 10 constituent entities in the agricultural machinery industry involved in the industrial production of industrial products (Yelabuga Automobile Plant

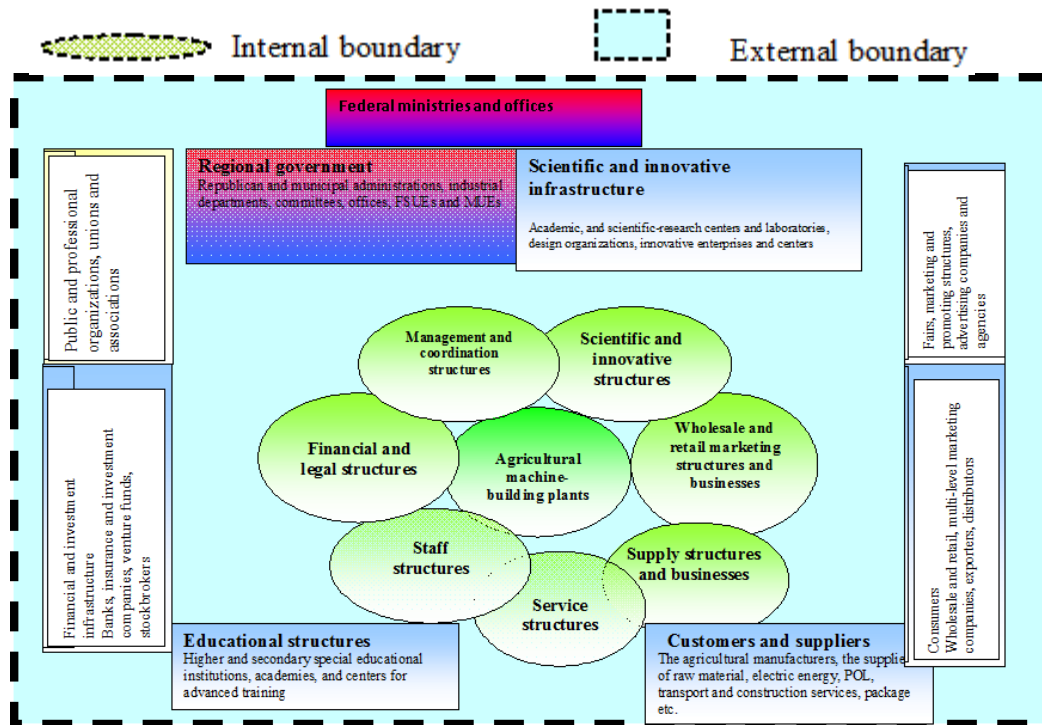


Fig. 2: Internal and external boundaries of the agricultural machine-building cluster

Buinsk Machine-Building Plant, “Kamaz”, “Agromash holding”, “Agro-Alliance” “Kazan selmash” JV “Unibox”, “Utex” “Ayu-Agro”, “PKF SpetsAvtoTekh” and other companies engaged in the production of agricultural machinery.

At least one constituent entity in the agricultural machinery industry involved in the final industrial output for the purpose of its further realization in domestic and Foreign markets with the use of industrial products of all members of the industrial cluster (Yelabuga Automobile Plant).

At least 2 technological infrastructure facilities required by the members of the agricultural machine-building cluster for establishment of a set of industrial entities (Yelabuga Automobile Plant, “Kamaz”).

At least one non-commercial organization engaged in monitoring and organizational support of the agricultural machine-building cluster development (the Ministry of Agriculture and Food of the Republic of Tatarstan).

At least one financial organization engaged in financing of and support for the members of the agricultural machine-building cluster (JSC “Russian Agricultural Bank”).

Creation and development of the agricultural machine-building cluster shall be performed subject to the strategy of spatial development of the Russian Federation

as well as the schemes of territorial planning of the Russian Federation and the Republic of Tatarstan. Labor productivity in the agricultural machine-building cluster for the previous reporting period shall exceed average labor productivity in the manufacturing industry of the constituent entities of the Russian Federation which territory places the infrastructure of the agricultural machine-building cluster but the infrastructure of the agricultural machine-building cluster shall be located within the boundaries of the constituent entity of the Russian Federation or within the boundaries adjacent to the Republic of Tatarstan; the number of highly-productive jobs within the framework of the agricultural machine-building cluster shall be at least 50% of the jobs of all members of the agricultural machine-building cluster.

The internal boundary, i.e., the agricultural machine-building cluster itself is presented in Fig. 2. In this case, a core of the cluster is the agricultural machinery manufacturing plants (Anonymous, 2015b).

The external boundary of the agricultural machine-building cluster is represented by the structures involved in its economic activity and development on the basis of contractual relationships and performance of certain functions and orders. In this case, none of these representatives is a member but a partner (Anonymous, 2007).

Regional administrations and their subdivisions are represented in the external boundary of the agricultural machine-building cluster as a government.

Establishment of the agricultural machine-building cluster shall be supported by the agreement on the establishment of a set of agricultural machine-building entities interrelated in the specified area as a result of their territorial affinity and functional relation and located in the territory of either the Republic of Tatarstan or several constituent entities of the Russian Federation involved in this production which shall be concluded by and between the cluster and the Government of the Republic of Tatarstan.

A specific economic zone “Alabuga” which provides investors with a fully-developed industrial, engineering, transport and customs infrastructure as well as a number of tax and customs privileges, may become a technological infrastructure of the agricultural machine-building cluster.

**Summary:** The expected economic effect and governmental task of import phase-out can be achieved through the successful implementation of the agricultural machine-building cluster project. This project has become particularly relevant under the need to provide Russia with domestic products. In connection, there with the Government of the Republic of Tatarstan has faced a number of challenges:

- Organization of agitation campaign for the members of the agricultural machine-building cluster directed towards their economic cooperation within the cluster
- Reation of working groups for coordination of the agricultural machine-building cluster (coordination councils)
- Development of investment measures
- Stimulation and formation of the integrated structures, various organizational and legal forms and types of activities in the agribusiness industry
- Formation of a modern marketing and promotion system for its own products as part of import phase-out program

## CONCLUSION

Thus, the economic mechanism of formation and functioning of the agricultural machine-building cluster should focus on the implementation of synergistic effect. It is achieved by creating a common financial, material, informational, innovative and other resources, jointly entering the domestic and Foreign markets with competitive products, reducing costs, balancing the interests of the cluster entities, organizing an effective self-government system, etc.

## ACKNOWLEDGEMENT

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