

Copyright © 2014 by Academic Publishing House *Researcher*

Published in the Russian Federation
 European Researcher
 Has been issued since 2010.
 ISSN 2219-8229
 E-ISSN 2224-0136
 Vol. 81, No. 8-2, pp. 1532-1545, 2014

DOI: 10.13187/er.2014.81.1532
www.erjournal.ru



Current State of Production and Finance Development of Scientific and Technological Progress in Agriculture

Danil M. Matveev

Novosibirsk state agrarian university, Russian Federation
 630039, Novosibirsk, Dobrolyubova st., 160
 PhD (Economy), Associate Professor
 E-mail: danil-matveev@list.ru

Abstract

Poor efficiency in the use of land, labor, finance and other resources available is characteristic of Russia's agriculture at the present stage. In most subindustries, the country has not yet achieved the production volume of the early 90s. In the last decade there was a positive trend marked to update logistics and intensify innovative advance in the agriculture, the processes being actively supported by the state, but this did not result in appreciable improvements of the agriculture competitiveness in the global food market. During the study it is revealed that the industry credit debt has gone up three-fold over the past 7 years that made up 1.43trillion rubles versus 112 billion rubles of revenue in 2012. The authors propose a technique to attract private investments in the agriculture of Russia and economic-organizing mechanism to realize it. Hereto, a considerable part is played by state regulation, particularly to provide investment-back guarantees in the event that a project-implementing agricultural organization goes bankrupt. To hold up, the authors consider a number of investment projects implemented by one of the Russian Federation entities which demonstrate their effectiveness both for the investors and the state. Employing the data obtained from the study will allow to largely increase the rates of technical and technological re-equipment of the industry, improve its investment attractiveness and competitiveness based on innovations and this will provide the country's food safety and gross domestic product growth.

Keywords: agriculture; scientific and technological advance; projects funding; state regulation; investment attractiveness.

Introduction

At the present time, Russia's economy is characterized by low rates of development. This is mainly caused by the technical and technological backwardness of its major industries, except for those aimed to extract and realize natural resources. Russia's agriculture is virtually non-competitive in the world market because of appreciable technological lagging of the industry, poor supply of the main types of modern farm machinery and lack of qualified personnel. Herewith, the volume of output in the industry was 3.34 trillion rubles in 2012. Over the past 5 years, the level of agricultural production profitability rose to 9.4%, yearly inflation rate being 7.6% averaged over the same period. All these combined with insufficiently growing state support make the transition to a new technological setup virtually impossible [1].

Russia's joining the World Trade Organization (WTO) and the reduction of restrictive customs barriers for main food importers largely undermines the competitiveness of Russian farm commodity producers. The commitments undertaken envisage not only market opening, but also the declining scope of state support for the industry from \$ 9 billion to \$ 4.4 billion by the year 2018. In our opinion, the transition of big agricultural organizations to the new technological level will allow to create points of increase in the industry and more rapidly promote scientific and technological achievements and good practice to production. To do this, it is reasonable to develop the mechanism to attract big private investors and its realization shall ensure the industry development on the innovation basis [2].

Materials and Methods

The analysis carried out in the current state of agriculture rests on the data presented by Russian Federal State Statistics Service for the period 2005 – 2012. To do this job, annual reports of the biggest farm commodity producers of Novosibirsk region (Novosibirskaya oblast) were readily used. During the study the authors applied standard methods of statistic analysis, such as descriptive statistics, comparison, analysis and synthesis, pictorial representation, etc.

To study the efficiency of investment projects implemented and the state support operating for the industry the data of the Novosibirsk region Ministry of Agriculture were used, so were the business-plans of commercial organizations.

Discussion

Nowadays, the efficient production cannot be ensured without applying the latest technologies. The demand for innovative products grows with each year coming. The latest alternative (resource-saving) technologies applied and innovative techniques introduced into farm economy management largely determine the organization's competitiveness under modern market conditions. In spite of the growing state support, Russian agriculture lags behind the European in many respects. Under the WTO conditions, Russia's farm commodity producers will be unable to compete with foreign suppliers. The way out of the situation can be the industry's transition to the new technological setup focused on the introduction of new technologies and equipment.

The major factors restricting the advance of Russia's agriculture and its technical and technological re-equipment at the present stage are:

The first factor is **social-psychological**. In this case, a question of importance is qualified personnel – scarce for today – who are ready to master innovative technologies and equipment. At the present time, there is a negative trend observed in the agriculture, viz. the rural young people's outflow to big cities and reduced number of working-age population [3].

Table 1: Dynamics of the population size in village and city

Index	2007	2008	2009	2010	2011	2012	2013	2012 vs. 2005. %
Population, mln.pers.	142.0	142.7	142.8	142.8	142.9	142.9	143.0	101
residing in village	38.1	37.9	37.8	37.6	37.5	37.3	37.2	97.6
Working-age population, mln.pers.	90.1	89.8	89.3	88.0	87.9	87.1	86.1	95.6
residing in village	23.0	22.9	22.8	22.2	22.1	21.8	21.4	94.6
rural population,%	26.6	26.5	26.4	26.3	26.2	24.1	26.0	-

* According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

The population residing in rural territories goes down with each year coming and in 2013 it constituted 37.2 mln. people. It is observed that since the year 2007 the size of working-age population has been declining as well. The range of the decline was from 90.1 in 2007 to 86.1 mln. people in 2013. The deficiency of qualified personnel made agricultural organizations to be headed and governed by specialists without higher education who had not been trained to operate on the innovation basis (table 1.)

Table 2: Labor productivity in agriculture

Index	2005	2006	2007	2008	2009	2010	2011	2012	2012 vs. 2005, %
Gross domestic product, trillion rub.	21.61	26.92	33.25	41.28	38.81	46.31	55.80	62.6	2.9 times as much
incl.: farm output	1.38	1.57	1.93	2.46	2.52	2.59	3.26	3.34	2.4 times as much
Agriculture's share in Russia's GDP, %	6.4	5.8	5.8	6.0	6.5	5.6	5.8	5.3	-
Population employed in all the branches of national economy, mln. pers.	68.3	69.2	70.8	71	69.4	69.9	70.9	71.6	104.8
Agriculture-employed population, mln. pers.	6.9	6.9	6.3	6.0	5.8	5.4	5.5	5.2	75.4
Average monthly labor payment for the agriculture-employed, tsd. rub.	3.65	4.57	6.14	8.48	9.62	10.67	12.46	14.13	3.9 times as much
Labor productivity averaged over national economy, tsd.rub./pers.	316.4	389.0	469.6	581.4	559.2	662.5	787.0	874.3	2.8
Labor productivity in agriculture, tsd.ru./pers.	200.1	227.6	306.6	410.2	433.8	479.2	593.0	642.4	3.2

* According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

To date, the agriculture employs 5.2 mln. people, the type of the activity concerned is the least paid in the whole country. Monthly labor payment averaged over the year 2012 was 14.13 tsd. rubles, the share of agriculture in the country's GDP being 5.3% without processing enterprises included and the rates of productivity growth exceeding mean values for the economy (table 2).

The second factor exerting a negative influence upon the innovation advance of Russia's agriculture is **information-methodical**. The out-of-date mechanism of information dissemination and the absence of unified information-technology system of scientific support cause the information to disseminate irregularly therefore farm commodity producers are often unaware of benefits and programs they can employ. This also holds true for mastering the achievements of scientific and technological progress, employing the innovative techniques of agricultural economy management and introducing good practice of developed countries [5].

To develop and increase the number of information extension centers that shall take on the functions to solve management and production problems can be an effective resolution of the factor. Centers of the type will assist in efficient using the state support funds and investment stock, optimizing machine and tractor fleet under the conditions of transition to the latest production technologies of agricultural output [1].

The system of information extension activity in agriculture performs four functions:

1. Information. Represents the structure of public access and is of reference database character.

2. Advisory. Includes the structures of advisory service for Agroindustrial Complex (AIC) entities. The final outcome of the activity is to develop recommendations for the client's problem resolution.

3. Training. Enhances economic and managerial competence of top-managers of enterprises via workshops conducted not only by advisors, but also by leading agricultural scientists.

4. Innovation. Information extension centers are to serve as a link between research institutions, agrarian universities and farm commodity producers. It is worth noting that this is the most challenging and important function as the ways of farming in Russia are very different because of the vast territories, which makes it impossible to apply the same developments in different parts of Russia.

In 2012, the advisory service of Russia's agriculture employed 3017 advisors, of them, 1100 people worked (36%) in regional organizations, 1917 (64%) did in district (rayon) extension centers.

Throughout the entire period examined there has been an appreciable growth in government allocations to support the information extension centers, from 217.8 mln.rub. in 2007 to 508.9 mln.rub. in 2012 (table 3).

Table 3: Dynamics of financial support for the activities of organizations engaged in agricultural advisory service, mln. rub.

Funding sources	2007	2008	2009	2010	2011
Federal budget	34.8	157.6	309.2	11.9	0
RF entities budget	104.9	153.1	181.6	264.4	274.4
Municipal formations budgets	25.5	32.9	59.8	107.4	131.8
Off-budget sources	52.6	106.9	105.8	116.2	102.7
Total	217.8	450.5	656.4	499.9	508.9

* According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

The third factor that restrains the advance of agriculture is ***economic-organizing***. The point is that the obsolete mechanism of innovative products mastering and low solvency of these products' consumers cause the novelties to take quite a long time to be put into operation. Besides, agricultural producers do not have enough equity to afford the latest technology and as a result, have to take on credit. It is improved investment attractiveness of the industry that can solve the problem. At the present time, big investors do not feel like investing money in agriculture because of high risk and low profit [6].

Three directions to enhance investment amounts can be defined:

1. Human capital investments. In the view of the aforesaid, agriculture experiences the lack of professional staff therefore it is urgent to arrange and conduct their comprehensive training and on-the-job training. All these require big funding, but the outcome will be high, appropriate to the funding.

2. Investments in biological resources development. The efficiency of agricultural production directly relates to the quality of biological stock. For example, yielding capacity depends on biological properties and quality of seeds and soil fertility, livestock productivity does on feed quality and properties.

3. Investments in development and introduction of energy- and resource-saving technologies will, in a relatively short time, allow to increase labor productivity, utilization of nature and landscape resources as well as labor and financial ones.

A positive trend to solve the problem of improving the efficiency and competitiveness of home farm commodity producers in the world market has been observed since the year 2006 when the implementation of the Federal Law «About the advance of agriculture and agrifood market in Russian Federation» began. In 2008, the state program of agricultural development and regulation of farm produce, raw stock and food markets for 2008-2012 joined into force. In the frameworks of the program, state funding for the agriculture appreciably went up both on federal and regional levels. This made it possible to bring agriculture degradation to a stop in most entities of Russian Federation. Regarding the branches, such as pig-breeding and poultry-farming, there was a positive trend observed in the volumes of production and its efficiency (table 4) [7].

Table 4: Efficiency of state support for agriculture

Index	2005	2006	2007	2008.	2009	2010	2011	2012
Total consolidated budget expenditures for agriculture and fishery, bln.rub.	78.6	110.8	146.4	238.3	279.1	262.3	268.7	276.5
Crop area, mln.ha	75.84	75.28	74.76	76.92	77.81	75.19	76.66	76.33
incl.: grain and leguminous crops	43.59	43.18	44.27	46.74	47.55	43.19	43.57	44.44
Livestock population, mln. units:								
- cattle	21.63	21.56	21.55	21.04	20.67	19.97	20.13	19.98
of them: cows	9.52	9.36	9.32	9.13	9.03	8.84	8.99	8.89
- pigs	13.81	16.19	16.34	16.16	17.23	17.22	17.26	18.82

- sheep and goats	18.58	20.2	21.5	21.77	21.99	21.82	22.86	24.18
- poultry	357.47	374.69	388.96	404.55	433.7	449.3	473.39	495.85
Farm output index (in comparable prices; percentage vs. the year preceded)	101.6	103	103.3	110.8	101.4	88.7	123	95.2

* According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

A number of regions (oblasts) passed legislative acts aimed at the development of individual branches of agriculture and its complex re-equipment. Combined with the adequate funding, this allowed to achieve a positive result. Over the last 7 years the machine and tractor fleet has been promptly re-equipped, prerequisites have been created for raising cattle population. During this period, the cost of fixed assets in agriculture increased 2.3 times (table 4). For example, in Novosibirsk region, state and institutional programs realization allowed to launch big projects for the construction of livestock-breeding and vegetable production complexes, appreciable re-equipment of machine and tractor fleet with modern resource-saving and high capacity machinery. It was in 2012 that farm commodity producers of the region purchased 1300 units of equipment and farm machinery.

Table 5: Renewal of fixed assets in RF agriculture

Index	2005	2006	2007	2008	2009	2010	2011	2012
Fixed assets available in RF agriculture, bln.rub.	1440.1	1574.7	1963.3	2259.6	2566.9	2859.9	3127.2	3332.1
Investments in fixed assets, bln.rub	142.3	224.2	338.5	399.7	325.2	303.8	446.9	473.4
Dynamics of agricultural fixed assets changes at year-end (in comparable prices), %	98.2	99.6	101.3	101.1	100.8	101.5	101.9	101.7

* According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014).

However, the change in dynamics of separate regions advance does not allow to appreciably change the situation in the industry. The growth of investments in fixed capital barely allowed to stop reducing the tangible base of agriculture. Seen the cost of fixed assets at comparable prices, there has been, on average, 1% gain in the growth over the past five years (table 5), which is not enough to overcome the technical and technological gap that has been formed over 15 years of economic reforms [8].

Nowadays, 458 agricultural enterprises of different ownership forms operate in Novosibirsk region. Among them, the most efficient are the farms that make a substantial contribution to the formation of the industry gross product. Thus, during the year 2012, Novosibirsk region sold farm produce for the sum of 28.5 bln. rub., of this sum, 6.7 bln. rub. referred to the produce obtained by ten biggest agricultural organizations. The total area of agricultural lands occupied by the organizations makes up as little as 2.13%, as for a total of cultivated land, it constitutes 3.49% (table 6).

A total of basic assets accounts for 7.9 bln.rub., which constitutes 17.91% of the total, are consolidated in ten biggest enterprises of Novosibirsk region. Due to this, labor productivity at these enterprises is 1.6 times higher (1193.15 rub. / pers.) than the analogous index for the region. The cost of basic production assets per one employee is almost 2 times higher than the mean indexes and in 2012, it made up 2080.64 tsd.rub./pers.

Table 6: Contribution of ten biggest organizations to the agricultural output in Novosibirsk region (data of 2012)

Index	For the entire Novosibirsk region agriculture	Ten biggest and efficient agricultural organizations	Specific weight of ten most efficient agricultural organizations
Average yearly number of employees, pers.	39898	5091	12.76
Agricultural lands, tsd.ha	4406123	93755	2.13

Cultivated area, tsd.ha	1881932	65634	3.49
Earnings from the produce and service sold, mln.rub.	28498.7	6661.1	23.37
incl.: crop output	6739.0	543.5	8.06
livestock output	19940.2	5695.2	28.56
other types of activity	1819.5	422.4	23.22
Revenue from the produce and service sold, mln.rub.	2716.8	846.2	31.15
Accounts payable, mln.rub.	26873.1	5594.7	20.82
Cost of basic production assets averaged over a year, mln.rub.	44226.7	7923	17.91
Cost of produce sold, mln.rub.	25781.9	5814.9	22.43
Total energy capacities, tsd.hp	3257.3	288.8	8.87
Profitability level,%	10.54	14.55	-
Average labor productivity, tsd.rub./pers.	714.29	1193.15	-
Cost of fixed assets per 1 employee, tsd.rub./pers.	1108.49	2080.64	-
Grain crop productivity, metric centner/ha	9.6	16.3	-
Average yearly milk yielding per 1 cow, kg	3932	6600	-

* According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

Owing to the employment of modern equipment and technology the enterprises were able not only to increase production efficiency, but also to create favorable conditions for employees, which permits them to attract qualified professionals every year. Average yearly number of these farms' employees made up 12.7% (5091 pers.) of the total number of those engaged in the agriculture of Novosibirsk region [9].

The use of the latest technologies in grain crop production led these agricultural organizations to obtain the productivity of the crops reaching the level of 16.3 centner/ha, which is virtually 2 times higher than the mean value for the region in 2012. The result impartially shows that applying the latest scientific and technological achievements and accurately following production technologies make it possible to obtain even in droughts, which have been observed in a series of RF entities this year, great enough output to provide financial sustainability of enterprises.

Close Joint Stock breeding-farm «Irmen» shows the highest efficiency among the enterprises examined. In 2012, earnings of the farm from the produce realized made up 1079.8 mln.rub., the profitability level being 23.9% (table 7). Among the 10 biggest enterprises of Novosibirsk region, «Irmen» employs the highest average yearly number of people; in 2012 it constituted 936 farm workers.

Table 7: Main production and financial indexes of 10 biggest and most efficient farms in Novosibirsk region (data for 2012)

Index of 10 big and efficient farms in Novosibirsk region (data for 2012)	Closed Joint Stock Agrofirma Lebedevskaya	CJS Zavyalovskoye	CJS breeding-farm Irmen	CJS Politotdelskoye	CJS poultry-farm Novobaryshevskaya	CJS PF Posevinskaya	Open Joint Stock Kudryashevskoye	OJS PF Evsinskaya	Limited Liability Company Hothouse Complex Novosibirsky	LLC Shipunovskoye	Total
Average yearly number of employees, pers.	737	293	936	336	397	523	672	796	159	242	5091
Agricultural lands, tsd.ha	6243	15508	23097	11309	-	10600	5555	9317	-	12126	93755
Cultivated area, tsd.ha	4950	10224	15031	8150	295	10600	3883	5456	-	7045	65634
Earnings from produce sold, mln.rub.	638.3	121.7	1079.8	170.5	660.6	749.1	1956.7	848.6	315.3	120.5	6661.1

Incl.: - crop output	3.3	27.7	88.2	55.8	-	16.1	0.3	2.0	315.3	34.9	543.6
- livestock output	615.7	80.5	854.7	112.7	580.0	637.0	1935.7	821	-	58.0	5695.3
- other types of activity	19.3	13.5	136.9	2.0	80.6	96.0	20.7	25.6	-	27.6	422.2
Revenue from the produce and service realized, mln.rub.	16.7	4.6	213.9	39.3	98.1	54.8	314.0	36.7	57.5	10.6	846.2
Account payable, mln.rub.	1040.2	95.9	39.7	13.7	297.1	257.6	2429.2	447.8	853.2	120.3	5594.7
Cost of basic production assets averaged over a year, mln.rub.	317.3	315.3	1039.8	269.7	501.4	298.1	2637.0	577.0	1767.1	200.5	7923.0
Cost of produce sold, mln.rub.	654.5	115.5	894.8	137.8	579.4	696.3	1642.8	791.8	193.0	109.0	5814.9
Profitability level, %	2.6	3.9	23.9	28.5	16.9	7.9	19.1	4.6	29.8	9.8	-
Total energy capacities, tsd.hp	22.4	21.8	83.1	21.8	7.4	21.7	81.0	28.7	0.9	-	288.8
Labor productivity, tsd.rub./pers.	866	415	1154	508	1664	1432	2912	1066	1983	498	-
Cost of fixed assets per 1 employee, tsd.rub./pers.	431	1076	1111	803	1263	570	3924	725	11114	829	-

High labor productivity of these farms is determined by applying the latest technologies and resource-saving machinery as well as by innovative means of farming. Such agricultural organizations have an effect not only on the development of the industry and food security of the country, but also on that of village infrastructure.

Far from being scarce is their sponsoring activity when they are involved in cultural events, make investments in village infrastructure development, render financial, material and some other aid to educational and preschool institutions.

High level of production efficiency and sustainability of financial indexes make it possible for big agricultural organizations to attract substantial financial resources to update and advance material and technical base. Thus, 20% (5.6 bln.rub.) out of the total accounts payable in agriculture refer to the ten biggest farms of Novosibirsk region.

The effective mechanism to encourage investments is to subsidize interest rates on loans for farm commodity producers. In some RF entities the volume of funding under the item concerned makes up to 60-70% of the total funds allocated from the federal budget. Regarding Novosibirsk region, 927.07 mln. rubles out of 1490.29 mln. rubles were submitted to perform the tasks in 2012.

Therewith, a series of negative trends is on the way to improve credit conditions, actual for today, and realize the mechanisms which encourage technical re-equipment of the industry. Thus, the total debt obligations of the agricultural organizations over the last 7 years have increased almost three times and totaled 1.43 trillion rubles. Arrears of bank loans increased 5 times – up to 1.0832 billion rubles.

Under the conditions of high-risk and low efficiency this level of debt negatively affected the financial state of many farms and over the same period of the year 2012, revenue volume of agricultural organizations grew at a slower rate. The debt level accounted for 112.3 billion rubles making further advance of the industry virtually impossible. At the current level of production efficiency, the deadline to meet credit obligations will be more than 10 years, excluding accrued interest (table 8).

Despite the appreciable updating the machine and tractor fleet and creating prerequisites for the introduction of the latest technologies, the production efficiency remained bottomed out over all the period. In 2012, profitability level made up 15.3% in crop production and 10.6% in livestock-breeding. The tendency does not give any opportunity for farm commodity producers to merely re-equip the production. Moreover, it does not allow to encourage ordinary reproduction of resources.

Table 8: Assessment of financial status and efficiency of production-financial activity of RF agricultural organizations

Index	2005	2006	2007	2008	2009	2010	2011	2012
Total debt liabilities, bln.rub.	395.3	517.4	700.6	871.7	999.1	1125.7	1260.8	1431.4
incl.: accounts payable	199.8	203.1	219.7	249.9	272.3	284.5	309.6	348.2
bank loans payable	195.5	314.3	480.9	621.8	726.8	841.2	951.2	1083.2
Accounts receivable, bln.rub.	91.0	136.3	179.9	209.7	240.4	274.3	313.7	366.5
Number of organizations (at year-end), tsd.	19.8	17.6	15.6	9.0	7.8	7.2	6.8	6.4
incl.: profitable organizations, tsd.	11.5	11.4	11.7	7.1	5.7	5.2	5.2	4.7
% of organizations total	58.3	64.7	74.9	78.5	73.0	72.1	76.8	72.6
reported profits, bln.rub.	61.6	75.1	113.5	115.5	98.7	111.0	131.7	156.8
unprofitable organizations, tsd.	8.3	6.2	3.9	1.9	2.1	2.0	1.6	1.7
% of organizations total	41.7	35.3	25.1	21.5	27.0	27.9	23.2	27.4
reported loss, bln.rub.	31.3	27.4	19.9	24.2	35.3	44.2	32.8	44.5
Profitability of sold goods, produce (works, services) in crop production, %	6.4	10.6	23.1	17.5	9.1	12.4	14.2	15.3
Profitability of sold goods, produce (works, services) in livestock-breeding, %	9.5	8.1	9.1	7.5	9.6	8.6	7.6	10.6
RF inflation rate, %	10.91	9.00	11.87	13.28	8.80	8.78	6.10	6.58

* According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014).

Over the period examined, the number of agricultural organizations reduced from 19.8 to 6.4 thousand, most of them went bankrupt and the number of loss-making enterprises in the general structure went up to 1.7 thousand units in 2012. The number of profit-making farms decreased 2 times, their production efficiency growing virtually *pro rata*. The average profit per 1 profitable organization accounts for 33.4 mln.rub., the average loss per 1 unprofitable organization is 21.1 mln.rub.

Novosibirsk region positive experience of the support for investment projects on material and technical re-equipment in the industry via regional budget subsidizing up to 50% of the new equipment cost has some considerable restrictions. It is the organizations with no arrears of wages, taxes and levies for off-budget funds that can be supported. Only 30-50% of the farms were able to make use of the institutionary program during the period of its implementation.

Herewith, the funds are returned as repaying bank credits in equal installments. For example, given an organization purchases machinery with 3 mln. rub. of its equities and 7 mln.rub. of the funds borrowed, Novosibirsk region Ministry of Agriculture can make up for only 1.5 mln. rub. (50% of 3 mln. rub.), but the rest of the money is reimbursed as the credit is called in and this can take long. Therefore, the greatest promoting effect is achieved only when buying modern machinery with the equities or the funds of private investors. Under current economic conditions of agricultural production, there are little monetary means available and private investors are reluctant to invest because of low profitability and high risks.

The terms of state regulation of food market and agricultural support are amended in accordance with the WTO rules and call for the developed level of public funding to reduce from \$9 bln. in 2013 to \$4.4bln. in 2018. Considering this reduction conjugated with the annual growth of price disparity, the actual funding for the agrarian sector of economics will be no more than 1/3 of the current level.

In the view of the fact that the farm output is 5.9% averaged over GDP and the agriculture employs 5.2 mln. people, the increase of public and private investments in technical and technological modernization and re-equipment of the material-technical base shall, in a short time, improve rural people’s welfare, create new jobs and ensure food safety. However, there has been, as yet, no effective mechanism to promote private investors.

Low investment attractiveness of the industry is determined by high risk and almost zero return on the capital employed. Most projects pay off only 5-10 years later and provide a 7-15% return, which makes them non-efficient versus the risk.

In our opinion, if the state provides private investment-back guarantees and rate of return on capital of 10% per year, the interest in agriculture will be aroused in big industrial organizations and private investors, including foreign ones.

The technique developed by the authors to attract private investments in major investment projects to implement in agriculture is represented in the figure and includes several stages.

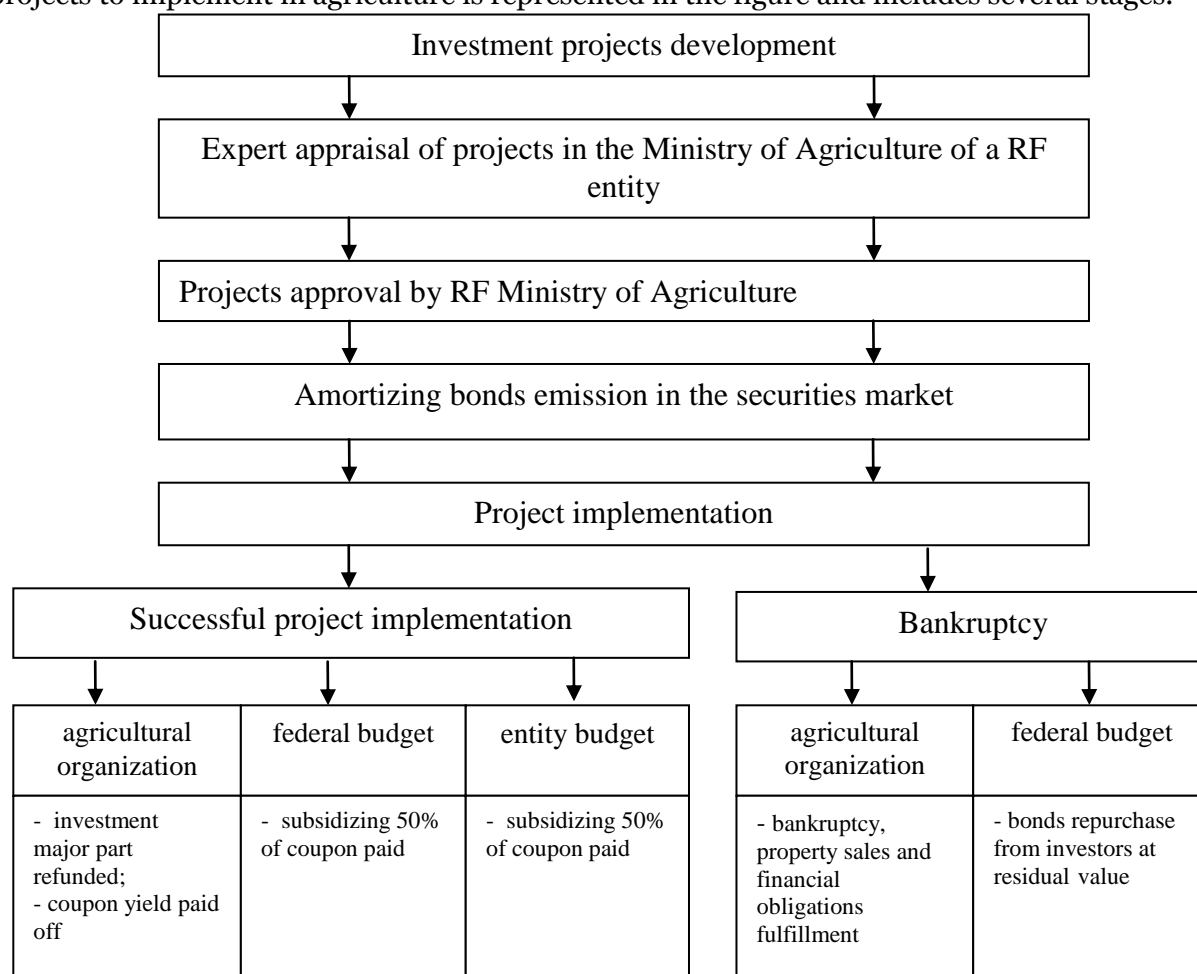


Fig. 1: Techniques to attract private investments in major investment projects to master scientific and technological achievements in agriculture

At the initial stage, agricultural organizations work out investment projects and submit them to regional ministries of agriculture where they undergo expert appraisal for the following criteria:

- the level of enterprise bankruptcy risk in the project;
- anticipated economic effect;
- project payback period;
- investment-back guarantees;
- amount of equity investments;
- social importance of the project (employees’ income growth, creation of new jobs, development of rural infrastructure, etc.);

- tax revenue entry to the budgets of all the levels;
- assessment of the current financial status in company

After perspective projects are selected, they are submitted to RF Ministry of Agriculture to approve.

Further on, amortizing bonds are placed in the securities market for each of the approved business-plans and this is done on the analogy of RF entity loans placement. It is reasonable to establish the level of coupon yield not less than 10% per year for the category concerned. Considering the characteristics of agricultural production, the principle debt will be paid back in equal installments over the entire period of securities circulation in the market.

Because of the low production efficiency, investors' income has to be secured by the federal budget and the budget of RF entities at the level recommended on the analogy of partial subsidizing the interest rate on bank loans. The budgetary funds have to be allotted on the basis of joint security: 50% - the federal budget, 50% - the RF entity budget.

In the event of enterprise bankruptcy the bonds are repurchased from the investors at residual value, at the expense of the federal budget. To realize the techniques proposed will make it possible to appreciably increase the amount of investments in agriculture and the number of big investment projects for production organizing and farm output processing, the cost value of the projects exceeding 100 mln.rub.

Table 9: Return of private investments (ROPI) over the investment project implementation

Date	Coupon rate	Par bond	Redemption at par value	Coupon amount
15-30.12.2014	Placement in the stock market			
31.12.2015	10%	1000	200	100
31.12.2016	10%	800	200	80
31.12.2017	10%	600	200	60
31.12.2018	10%	400	200	40
31.12.2019	10%	200	200	20
Total			1000	300

The calculations show that to attract 100 mln.rub. private investments of a 5-year return period according to the technique proposed will cost 30 mln.rub. for the state (15 mln.rub. for the federal budget and 15 mln.rub. for the RF entity budget). Given the average annual inflation rate 7.6% over the last 5 years, this is acceptable (table 9).

The mechanism to attract financial resources with the technique concerned will be as follows (fig. 2).

Interval unit investment fund (UIF) is being set up on the basis of OJS «Rosselkhozbank». The aim of the fund is to invest the deposited funds in major projects to modernize agricultural production or establish new enterprises on the basis of applying the latest scientific and technological achievements. Depositors may be private investors, business organizations and other big investment funds, including foreign ones. The UIF characteristic is that the fund shares are bought and sold not every day, but, in our event, once a year on December 15-30. This will permit the UIF not to keep part of the cash means in the accounts to perform unscheduled refund for a shareholder, but invest them in projects in full.

After closing the buying interval, one or more projects are chosen which have already been selected by the Ministry of Agriculture to invest in amortizing bonds. The main advantage of such bonds is to refund the principle debt in equal installments during all the period of their circulation. Annual inflow of cash means to the UIF account after coupon yield paid and debt partly redeemed will allow the management company to meet its obligations for shareholders and expand an investment portfolio.

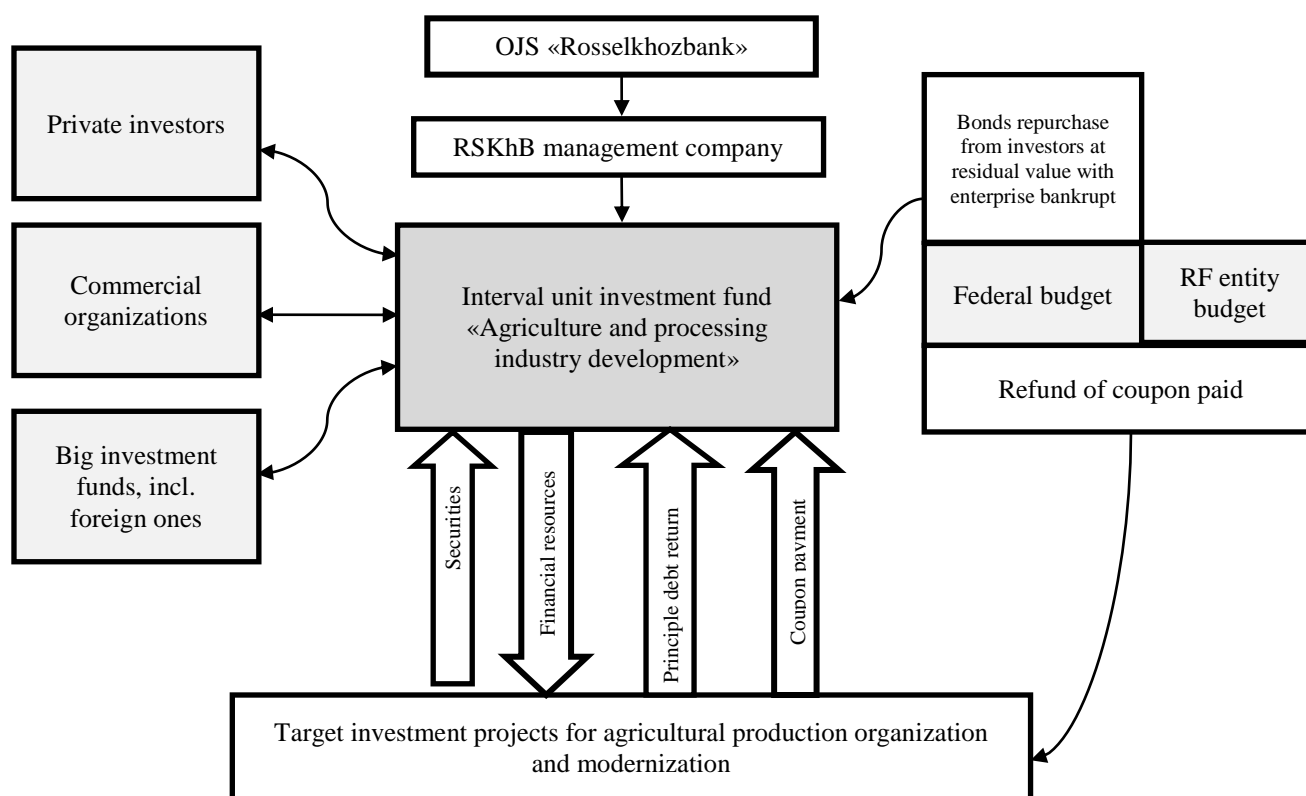


Fig. 2. Mechanism to attract financial resources in the frameworks of complex projects implementation to master scientific and technological achievements

A part the state plays in the mechanism involved is to perform the function of a guarantor that undertakes the obligation to pay the damages of the fund in the event of bankruptcy of the investment object recommended through repurchasing the bonds from the one at residual value.

Additional incentive effect will be achieved by subsidizing agricultural organizations at the expense of the coupon paid. Expenditures of this area should be equally shared by the budgets of RF entities and the federal budget.

The mechanism proposed and operating in Novosibirsk region to attract financial resources allows to use state support for technical modernization of agriculture and receive a 50% subsidy of the total costs in full, which is not possible when using a bank loan. This makes it possible to develop financial resources back up in the first year of the project that is sufficient to sink the debt (amortized deduction of par bond) for 2.5 years. Over this period, an agricultural organization can implement the innovative project of technical and technological re-equipment and reach the targeted indexes of production volume.

Efficiency to attract private investments in the mastering of scientific and technological achievements and technical and technological re-equipment of agriculture is evidenced by a great many projects. For example, since 2012 four big projects have been implemented in Novosibirsk region, the total cost having been nearly 8 bln.rub. The implementation significantly enhanced the efficiency of agricultural production and created the points of GDP growth in the agriculture of the region.

The first project has been implemented since the year 2011 at the enterprise OJS «Kudryashevskoye», it aims to expand and modernize the operating pig-breeding complex. The volume of investments attracted makes up 2.3 bln.rub. After the project is terminated, it is planned to double its production capacities. At the initial stage of the project implementation the company's earnings were 2 bln.rub. (table 10).

Table 10: Economic efficiency indexes of the OJS «Kudryashevskoye» at current stage

Index	2010	2012
Number of employees, pers.	1010	672
Earnings, tsd.rub.	2125965	1956712
Net profit, tsd.rub.	226133	313958
Tax obligations, tsd.rub.	42073	92466
Principle debt on credits, tsd.rub.	1437619	1734186
Costs of labor payment, tsd.rub.	209618	212278
Average yearly labor payment, tsd.rub.	208	316
Contributions to off-budget funds, tsd.rub.	36125	41098

The second project aims to build a livestock complex for the milking population of 3600 heads at OJS «Chernovskoye» in the structure of the management company of agroindustrial holding OJS «Raduga». Project implementation period is 2011-2013, the cost is 2.674 bln.rub.

Table 11: Efficiency of the investment project implementation at OJS «Chernovskoye»

Index	2010	2011	2012
Number of employees, pers.	393	391	358
Earnings, tsd.rub.	208514	294211	406812
Net profit, tsd.rub.	51905	31045	22937
Tax obligations, tsd.rub.	4255	3196	9302
Principle debt on credits, tsd.rub.	241308	329492	267511
Costs of labor payment, tsd.rub.	41083	47191	42578
Average yearly labor payment, tsd.rub.	105	121	119
Contributions to off-budget funds, tsd.rub.	8476	9470	8737

Implementation of the project concerned allowed to increase the amount of earnings two times over as little as 2 years (from 208 mln.rub. in 2010 to 406 mln.rub. in 2012). The decline in net profit, the amount of which was 23 mln.rub. in 2012, is determined by fulfilled financial obligations to creditors (table 11).

The third project has been implemented: a hothouse complex was built with its 17.24 ha area to cultivate vegetable crops; it is limited liabilities company Teplichny kombinat (hothouse complex) «Novosibirsky». The amount of investments for the period 2008-2012 made up 1.8 bln.rub.

Table 12: Efficiency of the project implementation on building the hothouse complex «Novosibirsky»

Index	2010	2011	2012
Number of employees, pers.	-	86	159
Earnings, tsd.rub.	491	124399	315245
Net profit, tsd.rub.	1072	8937	57507
Tax obligations, tsd.rub.	-	62792	61703
Principle debt on credits, tsd.rub.	319606	630279	1225663
Costs of labor payment, tsd.rub.	4674	30374	53934
Average yearly labor payment, tsd.rub.	-	353	339
Contributions to off-budget funds, tsd.rub.	-	5025	10080

Implementation of the project concerned allowed to create 159 jobs with average yearly labor payment at the level of 339 tsd.rub., which is 2.5 times higher than the mean value for the industry. The cost of produce sold when reaching the production volumes planned constituted 315.2 mln.rub. The project concerned allowed to increase tax revenue entries to budget and off-budget funds by 71.8 mln.rub. over as little as 2 years (table 12).

Implementation of the fourth project as well as the first one is in progress. Ltd company «Sady Giganta» started the construction of agrarian complex with a 7 ha- area hothouse farm and a vegetable storage facility of 13 tsd. ton capacity in 2010. The deadline of the project is August, 2015. The total cost of the project is 1054.0 mln.rub.

Table 13: Performance efficiency of the agrarian complex ltd. company «Sady Giganta»

Index	2012
Number of employees, pers.	38
Earnings, tsd.rub.	187223
Net profit, tsd.rub.	1168
Tax obligations, tsd.rub.	460
Principle debt on credits, tsd.rub.	502780
Costs of labor payment, tsd.rub.	10884
Average yearly labor payment, tsd.rub.	286
Contributions to off-budget funds, tsd.rub.	2510

In 2012, some production facilities were introduced in the hothouse complex. This allowed to obtain the inflow of additional funds and promptly occupy a niche in the market of Novosibirsk city with its 1.5 mln. population. The cost of produce sold made up 187.2 mln.rub. this year (table 13).

Conclusions

1. The increase in investment attractiveness of Russia's agriculture will allow to develop an impetus for enhancing the innovation advance of the industry and transmitting to the new technological setup. This will considerably improve agricultural efficiency and competitiveness in the global food market ensuring the growth of the gross domestic product of the country and the welfare of most population residing in rural territories.

2. The proposed techniques to attract additional investments are a synergic supplement for existing legislation to support farm commodity producers and encourage a sustainable advance of the industry.

3. To create favorable conditions for private investors permits to appreciably enhance the inflow of financial resources to Russia's agriculture and to implement big projects for comprehensive mastering scientific and technological achievements, thus intensifying the advance of the industry.

References:

Polukhin A.A. Approaches for justification strategy technical modernization of agriculture given the characteristics of agricultural development and resource provision subjects of the Federation / A.A. Polukhin // Russian journal of agricultural and socio-economic sciences. 2013. Vol. T. 24 (12). P. 22–27.

Матвеев Д.М. Управление технологическими процессами в сельскохозяйственных организациях / Т.А. Стадник, А.Т. Стадник, Д.М. Матвеев. Новосибирск: изд-во ЭКОР-книга, 2011. 245 с.

Можаев Е.Е. Развитие научно-технического прогресса в сельскохозяйственном производстве. М.: изд-во Спутник, 2010. 267 с.

Official site of Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014).

Stadnik A.T. Boosting the investment attractiveness of agricultural production / D.M. Matveev, A.T. Stadnik, D.V. Menyaykin // World Applied Sciences Journal. 2014. Vol. 31(8). P. 1535-1539.

Malyshkov V.I. Some aspects of the effective relations between government and business / V.I. Malyshkov // Life science journal, 2013. Vol. T. 10 (4). P. 2679-2682.

Lavrinenko P.A. Analysis of the investment attractiveness of projects in the field of environmental protection / P.A. Lavrinenko // Studies on Russian economic development. 2013. Vol. T. 24 (5). P. 495-499.

Bokusheva R. Dynamics of productivity and technical efficiency in Russian agriculture / R. Bokusheva, H. Hockmann, S.C. Kumbhakar // European review of agricultural economics. 2012. Vol. T. 39 (4). P. 611-637.

Матвеев Д.М. Техническое и технологическое переоснащение сельского хозяйства необходимо / А.Т. Стадник, Д.М. Матвеев, М.Г. Крохта, П.П. Холодов // АПК: экономика, управление. – 2012. – №5. – С. 68-71.