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The Main Directions of Sustainable Development of Agricultural Production

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Abstract:

This article notes that the main task of sustainable development of agricultural production in Kazakhstan is a special approach to its financial provision and financial regulation. Features of the circulation of funds in the organization of finance of agricultural enterprises which are a combination of relations with regard to the formation, distribution and use of funds, determine the search for the main sources of income of financial resources in the agricultural sector. The aim of the research is that one of the directions of sustainable development of agricultural production and adjustment of Kazakhstan's agrarian policy should be an investment development strategy based on the current situation in the agro-industrial complex of Kazakhstan. Transfer of agro industrial complex to the industrial-innovative way of development on the basis of strengthening of its material and technical base, growth of competitiveness of agricultural production assumes an increase in financing of the agro-industrial complex.

Keywords: sustainable development; agricultural production; republican budget; investments; profitability.

JEL Classification: Q56; Q15; O13.

Introduction

In the most countries of the world agricultural support is recognized as a national priority, and effective state regulation systems are implemented. In recent years the developed countries have been paying increasing attention to the problems of their own food security. Every year the funds allocated for financial support for agriculture are increasing.

The experience of developed countries in the field of financial support of the national economy and the creation of new competitive industries deserves a lot of attention including the agro-industrial complex. Each country chooses its own way of regulating the economy, developing and determining for itself the most optimal forms and methods. However despite the wide attention to the problems of regulation of the agro-industrial complex the main issues on the direction of sustainable development of agricultural production in Kazakhstan have not yet been fully explored.

1. Literature Review

Awareness of the importance of agrarian policy in the modern economy was reflected in the next President Nazarbaev's Message from January 10, 2018 "New Opportunities for Development under the Conditions of the Fourth Industrial Revolution " which noted that agrarian policy should be aimed at dramatically increasing labor productivity and increasing exports of processed agricultural products (Nazarbayev 2018). All this will require the technical re-equipment of agricultural production, the modernization of modern technologies, the use of advanced technologies, and therefore require significant infusion of financial resources into the industry.

During the period of economic reform in the agrarian and industrial complex of the Republic of Kazakhstan the foundations for the development of a multistructure economy, socio-economic transformations in property relations were laid, the corresponding legislative base was created, as evidenced by numerous studies of Kazakhstani authors: Kaliyev G.A. (Kaliyev 2013), Khan Yu.A. (Khan 2017), Alenova K.T. (Alenova 2013), Nurumov A.A. (Nurumov 2014), Nitalina, G.K. (Nitalina 2017), Utibaeva G.B. (Utibaeva 2011) and other scholars of agrarians and economists.

Although in recent years there has been an increase in the production of agricultural products at the same time the level of efficiency of the industry is still insufficient. The agricultural production of the country remains still small-scale and technologically backward. Problems in the agrarian sphere are further aggravated by Kazakhstan's accession to the WTO (Bakhtiyarova 2017).

2. Methodology

At agricultural enterprises there is a much ramified system of monetary and financial relationships. At each enterprise there is a circulation of funds which includes three stages: the acquisition of material assets necessary for production, or the supply process, the production process and the process of implementation. At the first stage of the circuit agricultural enterprises enter into a settlement relationship with suppliers to acquire the material assets necessary in the production process: oil products, mineral fertilizers, spare parts, etc. on the contracts concluded with the suppliers there are corresponding relationships for the delivery (receipt) of material assets, their payment, control over the established prices, compliance with the terms of supply and settlement.

At the second stage of the circuit in the labor process there is a productive consumption of means of production and the creation of a finished product with an increased value. Here a variety of relationships arise both with direct participants in production, various institutions and organizations, and specific monetary and financial relations associated with the change in forms of value. At this stage the relationship of the enterprise with employees on wages and their associated payments, accruals and deductions (accrual and payment of wages, the withholding and transfer of taxes, the calculation and transfer of amounts for social insurance and pension funds, the calculation and payment of premiums, benefits, etc.). In connection with the withholding of taxes from wages there are relationships with financial authorities on payments to the budget.

In the production process various funds and reserves are created in each farm the purpose of which is to ensure a continuous circuit. So to restore the consumed means of production, an amortization fund is created. To ensure various expenses with uneven payments, the reserves of forthcoming payments are created: for the payment of holidays, for the upcoming expenses for the repair of fixed assets, for the payment of remuneration for long service, etc.

At the third stage of the cycle the sale of manufactured goods, their payment, distribution and use of the increased value for the intended purpose takes place. Here there are various monetary relations and financial relationships with procuring organizations and various buyers. Farms conclude contracts with procurement

organizations (contracts) in which the volume, terms of sale, quality, and prices for products supplied, and settlement conditions are stipulated.

Formation of working capital in agro-industrial production also has some features. It is necessary to keep large reserves for a long time since the production cycle here is sufficiently large. The seasonal nature of agricultural production causes sharp fluctuations in the volume of circulating production assets for the periods of the year which calls for borrowing. The problems of financing that arise in agro-formations can be solved by attracting additional financial resources. Financial resources (profits, subsidies and compensations, investments, insurance, credit resources) in the system of reproduction in the industry and at the enterprise level are beginning to play an increasing role. However, at the present stage of development they do not provide sustainable economic growth (Aimurzina 2017).

The specifics of the financing of agricultural enterprises are determined by the specifics of agricultural production. The seasonal nature of agricultural production causes sharp fluctuations in the volume of circulating production assets for the periods of the year which calls for borrowing. Agriculture is also characterized by a large gap between the time of production and the working period, pronounced seasonality, a considerable duration of the production cycle. This determines the features of the circulation of funds in the agricultural enterprise, its relative slowness, the gradual increase in costs during the circuit, the release of funds from the circuit during the period of output and sale of products.

Features of the circulation of funds lead to specific forms in the organization of finance of agricultural enterprises which reimburse their costs by income. However, within a year they form a significant seasonal gap between the timing of costs and revenue which affects the organization of working capital enquires borrowing. The bulk of agricultural enterprises operate at the expense of loan funds before receiving income. The emerging problems of financing agricultural producers can be solved only by attracting additional financial resources.

3. Results

The aim of the research is that one of the directions of sustainable development of agricultural production and adjustment of Kazakhstan's agrarian policy should be an investment development strategy based on the current situation in the agro-industrial complex of Kazakhstan. Transfer of agro industrial complex to the industrial-innovative way of development on the basis of strengthening of its material and technical base, growth of competitiveness of agricultural production assumes an increase in financing of the agro-industrial complex.

Proceeding from the foregoing it can be noted that the intertwining of natural and economic conditions: the influence of natural and climatic conditions, the seasonality of production which is expressed in the discrepancy between the working period and the time of production of agricultural products, dependence on borrowed funds, uneven use of working capital and income of the agro-industrial complex requires a special approach to its financial provision and financial regulation. In our opinion the main task of financial security is the mobilization of financial resources by selecting sources of financing, attracting funds and using them. Financial resources formed from different sources make it possible for an enterprise to repay its obligations in a timely manner, invest in new production, provide expansion and technical re-equipment, if necessary finance research, development and implementation, etc. Features of the circulation of funds in the organization of finance of agricultural enterprises determine the search for the main sources of financial flows to the agricultural sector which are a set of relations with respect to the formation, distribution and use of funds of funds (financial resources) (Aimurzina, Kamenova, Omarova 2017).

Economic reforms in the agricultural sector of the Republic of Kazakhstan have led to significant changes for the period from 2010 to 2016 gross output of agricultural production grew almost 2 times or 76.1% as the situation shows. Despite the implementation of the "State Program for the Development of the Agro-industrial Complex of the Republic of Kazakhstan for 2017-2021" the expected effect of measures taken by the government has not yet been achieved. Although in recent years there has been an increase in the production of agricultural products, the level of efficiency of the industry is still insufficient at the same time. The agricultural production of the country remains still small-scale and technologically backward. One of the main factors negatively affecting investment activity is the financial instability of the majority of agricultural producers, low level of its profitability and significant risks as practice shows.

The factors of profit growth in the agricultural sector are associated with the peculiarities of demand for agricultural products and with the specific features of this industry. Table 1 shows that the profitability of livestock production in 2013 remained at the same level compared to 2009 while the profitability of crop production decreased in 2013 compared to 2011 by almost 2 times. Only in 2016 there is an increase in the profitability of crop production to 46.6% and livestock almost twice.

Table 1. Profitability of agricultural production for the period 2009-2016, in %

Indicator	Years							
	2009	2010	2011	2012	2013	2014	2015	2016
profitability of crop production, %	19,8	19,1	44,1	29,7	22,4	35,3	38,7	46,6
profitability of livestock products, %	8	15,2	15	14,3	7,6	16,6	9,9	16,8

Source: compiled and calculated by authors according to Committee of Statistics of the Republic of Kazakhstan

The GDP growth of the Republic of Kazakhstan testifies to the possibilities of a larger direction of investments in the economic development of the agricultural sector of Kazakhstan. In 2011-2015 720.2 billion tenge was invested in the fixed capital of agriculture which averaged 2.4% of the total investment (Table 2). However, the total increase in investments in fixed assets is formed as a result of only a significant contribution of own funds as well as the state budget while the contribution of borrowed funds has practically lost its significance.

Table 2. Investments in fixed capital of agriculture of Kazakhstan for 2011-2016, in billion tenge

Indicator	Years					
	2011	2012	2013	2014	2015	2016
including agriculture, forestry and fisheries	109,4	134	139,6	173,3	163,9	253,7
Investments in fixed assets, in billion tenge, total	5010,2	5473,2	6072,7	6591,5	7024,7	7762,3

Source: compiled and calculated by authors according to Committee of Statistics of the Republic of Kazakhstan

The situation shows that high risks limit the inflow of domestic and foreign investments. The financial instability of the majority of agricultural producers leads to the fact that foreign investors are reluctant to invest in the agricultural sector due to the low level of its profitability and significant risks. In this regard investment policy in agriculture has become short-term and to a greater extent represents short-term lending than full-fledged investment activity. In this regard one of the areas of support for agricultural producers is the intensification of financial support for agricultural producers by the state whose share in 2012 amounted to almost half of the financial resources 45.1% of the total funds. There is also an increase in financing from local budgets from 27.8% in 2012 to 41.1% in 2016 as well as the dependence of agricultural enterprises on investments in fixed assets whose share increased from 26.5% to 33.0% in 2016 (Table 3).

Table 3. Composition and structure of the main sources of financial resources of the agricultural sector of the Republic of Kazakhstan for 2012-2016, in billion tenge

Name	2012	2013	2014	2015	2016
Republican budget	228,0	184,0	161,0	172,0	194,0
The share in %	45,1	38,3	28,9	29,5	25,2
Local budget	140,9	153,0	219,1	241,4	316,0
The share in %	27,8	31,9	39,3	41,4	41,1
Investments in fixed assets	134	139,6	173,3	163,9	253,7
The share in %	26,5	29,1	31,1	28,1	33,0
Loans	3,2	3,3	4,0	5,2	5,3
The share in %	0,6	0,7	0,7	1,0	0,7

Source: compiled and calculated by authors according to Committee of Statistics of the Republic of Kazakhstan

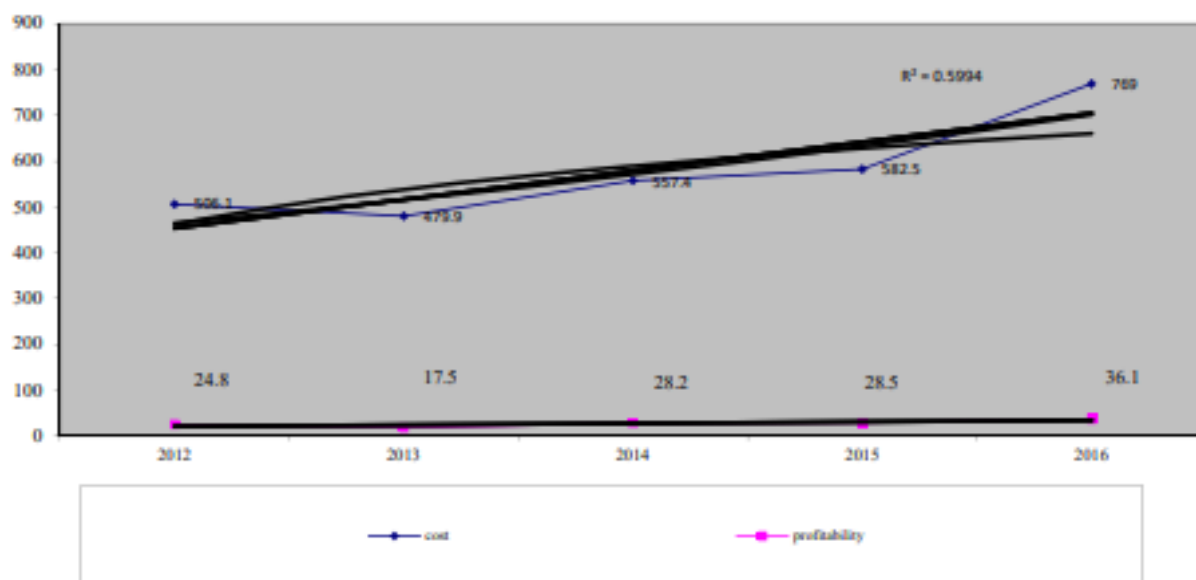
4. Application functionality

As the experience of developed countries shows further stabilization in agriculture largely depends on the level of its financial support. It is necessary to modernize and re-equip production through the development of institutional and industrial infrastructure, financial, insurance, information institutions as well as ensuring the safety and quality of products in accordance with international standards. The forms and types of investments used in Kazakhstan

should be actively complemented by effective financial mechanism instruments. For the "unloading" of budget expenditures is necessary to actively apply the mechanisms of public-private partnerships.

Analyzing the results obtained it can be concluded that more than 50% of the expenditure falls on the national budget. Thus the reliability of the approximation $R^2 = 0,7636$ at the equation $y = 62,84 x + 390,46$ shows a high dependence of the growth of profitability of agricultural production on costs, the following direct trend line allows you to predict a clear trend to increase profitability over the next years (Figure 1).

Figure 1. Relationship between agricultural production costs and profitability for the period 2012-2016



To calculate points using the least squares method, a straight trend line uses the following equation:

$$y = mx + b \quad (1)$$

where: m — costs;

b — profitability

The direct trend line shows the growth of profitability of agricultural products while the magnitude of the reliability of the approximation indicates a good coincidence of the calculation line with the data. That is the task is to attract additional financial resources to the industry in this regard. The implementation of the tasks of stabilization of economy of Kazakhstan transferred to the regional level of management which requires the expansion of the economic activities of regions and requires a new approach to the issue of relations between the Republican budget and local budgets, a correct assessment of the needs of the latest and state funding and regulations for its implementation. Therefore, one of the most difficult problems of budget reform is the development of an effective mechanism to provide local authorities with sources of financing for regional programs.

When studying the economy of the region as a whole or separate regional economic processes and phenomena often there are problems of analysis and assessment of the effects of various factors, conditions on the object of study, identification of economic objects and identification of homogeneous typical groups, modeling and forecasting their state. However, there is an objective difficulty in the fact that the economic processes and phenomena are characterized by a large number of different and stochastically related parameters in solving the above problems. This leads firstly to the duplication of information *i.e.* the same parameter is used multiple times, each time with different weights, and second to the spuriousness of the parameters changing a little in the transition from one object to another. Therefore, the initial parameters should be preliminarily subjected to the process of correlating with ensuring moreover a minimal loss of information. This solution can be achieved by reducing the dimension which includes in particular the principal component analysis (PCA). In addition, the PCA provides an opportunity for a concise and simpler explanation of multidimensional structures, reveals objectively existing not directly observed patterns with the help of the obtained main components.

Principal Component analysis — one of the main ways to reduce the dimension of the data losing the least amount of information. Invented by K. Pearson in 1901, the computation of principal components is reduced to the computation of eigenvectors and eigenvalues of the covariance matrix of the original data or to the singular

decomposition of the data matrix. Sometimes called the principal component transformation Karhunen-Loeve or the Hotelling transform.

The analysis of principal components is one of the ways to reduce the dimension consisting in the transition to a new orthogonal basis whose axes are oriented along the directions of the maximum variance of the set of input data. Along the first axis of the new basis the dispersion is maximal, the second axis maximizes the dispersion under the condition of orthogonality of the first axis, etc., the last axis has the minimum variance of all possible. Such a transformation allows you to reduce information by discarding coordinates corresponding to directions with minimal variance. The basis of this method is the reduction of a set of characteristics to several uncorrelated variables (the main components) representing a linear combination of the original variables. This means that objects can be represented as points in n -dimensional space, where n is the number of traits analyzed. Through the resulting cloud of points a straight line is drawn so as to take into account the largest proportion of the variability of the characteristics. The second line is then perpendicular to the first so as to take into account the largest remaining proportion of the variability of the characteristics (the second main component). These two components form a plane onto which all points are projected.

The initial data for the analysis is a table of collected statistical data the objects of which are the regions of Kazakhstan, and parameters - indicators for assessing the effectiveness of the use of financial resources: profit, profitability and costs. The aggregate of these indicators reflects the financial situation of agricultural enterprises, depending on the investment of financial resources. The multiplicity and interdependence of indicators predetermine the need to search for indicators of the effectiveness of the use of financial resources on the basis of the ideas that form the basis of the method of the main components taking into account the features of economic time series.

To analyze the effectiveness of investments the following methodology was used:

1. It is necessary to fill in the Table 4:

Table 4. Effectiveness of investments

Y	2012 year	2013 year	2014 year	2015 year	2016 year	Y max	Y min	R/2	av
Expenses	83709	95759	118323	160820	74422	160820	74422	43199	106606.6
Profitability	15,6	9,5	20,1	56,2	41,5	56,2	9,5	23,35	28,58
Profit	13058,6	9097,1	23783	90381	30885,1	90381,0	9097,1	40642,0	33441,0

Source: compiled and calculated by authors

2. Calculate $R / 2$ - the average value between the maximum and minimum indicators Y_i .

The sweep of the sample is the difference between the maximum and minimum values of X from the available statistical population:

$$R / 2 = \frac{Y_{\max} - Y_{\min}}{2} \quad (2)$$

3. Calculate av - the average value of indicators for a given period

$$av = \frac{1}{N} \sum_{i=1}^N Y_i \quad (3)$$

where: Y_i – indicators of costs, profitability and profit;

N – number of time periods.

4. Calculate the relative values of the parameters:

$$\hat{Y} = \frac{Y_i - av}{R / 2} \quad (4)$$

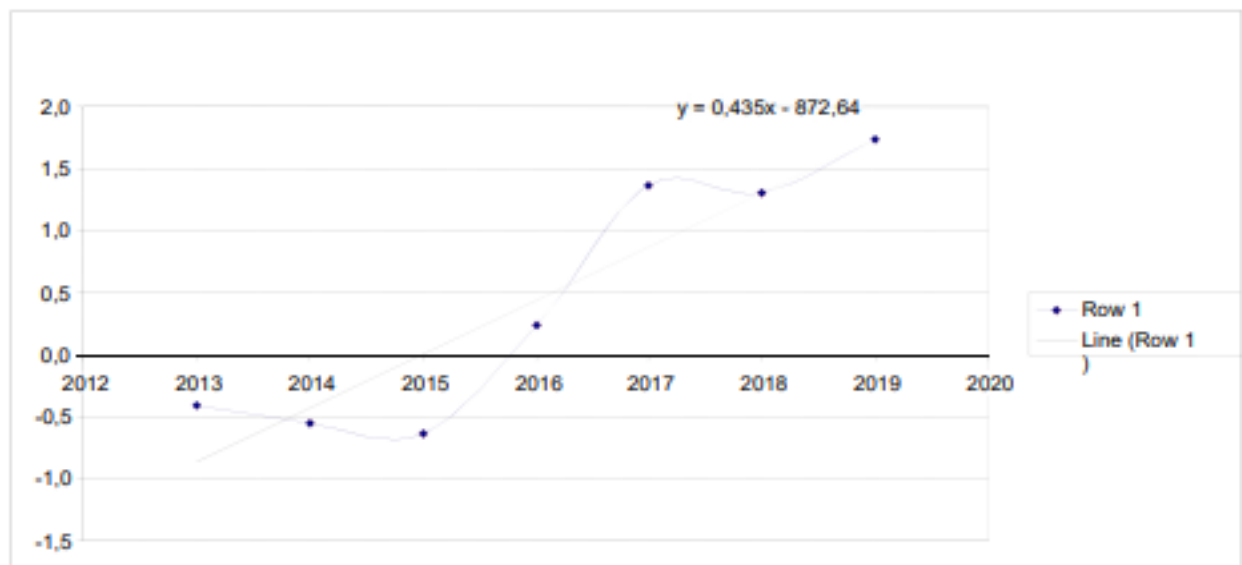
Table 5. Dependence between costs, profitability and profit of agricultural enterprises in the Republic of Kazakhstan

Name	2012	2013	2014	2015	2016	2017	2018
Expenses	-0,53005	-0,25111	0,271219	1,254969	-0,74503	0,008007	-0,04179
Profitability	-0,55589	-0,81713	-0,36317	1,182869	0,553319	1,553319	2,119058
Profit	-0,5	-0,6	-0,2	1,4	-0,1	0,9	1,3

Source: compiled and calculated by authors

The results show the closest dependence of profitability on the costs of agricultural production in 2013 and 2016. In other cases, the discrepancy is due to the influence of various factors such as the volume of products sold, the prices of products sold, the quality of products sold, weather conditions, etc. Forecast of the level of profitability is shown in Figure 2 which indicates that with the growth of invested financial resources in the development of agricultural production, the level of profitability will grow.

Figure 2. Forecast of growth in profitability of agricultural enterprises in the Republic of Kazakhstan



Conclusion

Thus it is necessary for the sustainable development of agricultural production: to assist investors in obtaining investment preferences in accordance with the Law of the Republic of Kazakhstan "On Investments"; creation of infrastructure facilities (industrial zones, business incubators, technology parks, engineering centers) in order to attract potential investors; preparation and holding of interregional and international conferences; conducting seminars on the development of direct contacts and cooperation with potential investors and financial institutions of the region.

It is necessary to create and develop rural cooperatives and large farms. In this direction the following activities should be carried out:

- assistance in uniting small commodity producers in cooperatives by providing the state with soft loans for the purchase of special technological equipment, vehicles, mini-workshops for the primary processing of livestock products and raw materials;
- participation in subsidizing the cost of mixed fodders, involving the livestock sector in the leasing program for technical and technological re-equipment;
- stimulation of the unification of agricultural formations through preferential crediting of cooperatives for harvesting, storage, processing and marketing of agricultural products.

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