

The Formation of Integrated Accounting and Analytic Space in the Agro-Industrial Cluster of the Region

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ABSTRACT

The present article is devoted to the solution of one of the most actual problems the agro-industrial cluster has to deal with nowadays. Aiming to get the competitive advantage it is absolutely necessary to modernize the accounting- and- analytic space in the context of joint activities involving interaction of all possible types of resources. As an upgrade option the authors of the article try to consider the complex use of Supply Chain Management and Activity-based Costing Systems methods. Analyzing the agricultural economy of the Altay region(Russia) the necessity to increase the efficiency of management decisions and to form an integrated and reliable decision making basis has been confirmed. The introduction of the proposed by the authors management accounting methods into the information system of cluster organizations will allow, on the one hand, to ensure effective and safe information exchange, and, on the other hand, to increase the reliability and analytical capabilities of the generated accounting data.

Keywords: *management, information system, management accounting, agro-industrial cluster, agriculture*

1. INTRODUCTION

In modern conditions, the creation of an effective management information system is a priority task in the context of the formation of agro-industrial clusters. Having differences in production technologies, in focus and approaches to monitoring and cost control, organizations and institutions face the need to develop a single information space model. The number and variety of management decisions taken by managers in these organizations is growing every year. At the same time the instability of the general economic situation, regional markets and economic conditions leads to an increasing number of risk and uncertainty situations, which also affect the complexity and multidimensional justification of management decisions.

The importance of the information for the management is determined by its increasing impact on the effectiveness of all spheres of the company activity. The data of foreign studies [1, p. 355] suggest that about 50% of all necessary information is mainly occupied by accounting management data. The authors suppose that the share of accounting data demand for the management structures in Russian organizations is no less.

1.1. Related Work

The necessity to improve the traditional approach to accounting and costing is confirmed by a big number of economists [2]. Meantime the absence of a comprehensive,

detailed and systematic accounting and costing methodology in the agro-industrial complex is mentioned in the works of both foreign and domestic authors [3, 4, 5.6].

R. S. Sharma, considering the organization of accounting in crop production, confirms the high relevance of the conducted research namely in this industry, as agriculture plays a big role in the economy and supplies raw materials for other industries. While creating the accounting system it is proposed to pay special attention to the efficiency indicators of different crops production, and therefore to the distribution of costs between them [4, p.63].

G. Petelin names the decrease in the efficiency of the accounting service due to the increasing amount of information and the need for a holistic comprehensive picture of the organization 's activities [5, p.24]as the main reasons to improve accounting in agriculture.

The current state of accounting in domestic agricultural enterprises is marked by a significant lack of quality information. In this regard, in agricultural enterprises it is possible to interpret only certain events, or long-standing facts of economic life, and it is impossible to determine the development trends in the activity of the enterprise [6, c.38].

The postulate that effectiveness depends directly on up-to-date, accurate and complete information is also confirmed in Iacob and Karim studies [7].

In present economic conditions it is necessary to pay the most attention to reliable calculation of the cost of agricultural products, as well as to the ways to reduce it [8, c. 232]. This is due to the fact that for most agricultural

organizations the cost of produced products is the main strategy of survival in the market of agricultural producers.

1.2. Our Contribution

However, the formation of the information system of the organization at present should take into account not only the peculiarities of the technological process and internal risks, but also the conditions of the external environment of the organization.

The interaction of agricultural enterprises in the structure of the agro-industrial complex defines new requirements to the organization of information flows and to the choice of a methodological basis for their creation. This study is devoted to finding the ways to solve the above given problem of accounting-and-analytic space of organizations in the agro-industrial cluster.

The present article proposes the way to improve the information space of organizations, taking into account the need for interaction of information resources within the framework of cluster functioning.

1.3. Paper Structure

The purpose of this article is to find the main directions to create the information system of agricultural organizations, taking into account the peculiarities of the technological process and modern requirements of the management of the agro-industrial cluster in the region. The research object is the economy of the agricultural industry of the Altay Region (Russia).

The study carried out includes two stages. Firstly, the competitiveness of the Altay region agricultural industry was assessed using the techniques of quantitative and qualitative analysis. The results of the analysis confirm the

postulate that effectiveness depends directly on up-to-date, accurate and complete information.

Secondly, in order to implement approaches to the creation of a single information-and- analytic space of cluster agents, it was proposed to improve the information management system of cluster-forming organizations of the Altay region agro-industrial complex on the basis of the integrated implementation of Supply Chain Management and Activity-based Costing Systems methods.

2. BACKGROUND

2.1. The Competitiveness Assessment of Altay Region Agriculture

The Altai region is an agrarian region due to the specifics of climatic and natural conditions. The competitiveness assessment of the agricultural sector is of great importance to determine the ways and directions for the region development.

The level of agricultural development in the Altay region is currently decreasing, despite its decisive role in ensuring food security of the State. Historically, the region is the largest supplier of agricultural products to all regions of the country, so the problems in the agricultural industry demand a thorough economic analysis, including the competitiveness analysis.

The competitiveness assessment of the agricultural sector in the region is carried out on the basis of performance indicators in the organizations of all categories. The production competitiveness index is integral (Table 1).

Table 1 Performance indicators in the organizations of all categories of the industry "Agriculture, hunting and forestry" of the Altay Region 2013-2017.

Indicators	2013	2014	2015	2016	2017	2018
Index of agricultural production to the previous year,%	122,7	88,7	107,1	112,5	101,8	103,3
Growth rate of gross crop collection to the level of the previous year,%:						
- grain	195,7	66,9	119,6	122,6	103,0	100,7
- potatoes	130,5	96,7	95,0	116,8	88,8	98,6
- vegetables	96,2	95,2	102,2	117,5	83,1	89,8
Growth rate of livestock production to the level of the previous year,%:						
- livestock and poultry	101,6	102,2	98,7	95,9	97,1	103,8
- milk	94,5	103,7	100,0	99,0	100,1	98,8
- eggs	95,9	105,9	101,1	101,8	99,4	101,4
Competitiveness Index of the Altay Region on Agricultural Productivity Indicators	1,196	0,942	1,034	1,094	0,962	0,995

Based on the data given in Table 1, it can be concluded that in 2013-2018 the competitiveness index of the Altay

region on indicators of agricultural production performance has a value close to one.

At the same time, the highest value of the competitiveness index was observed in 2013. Since this period of time the level of competitiveness of the agricultural industry in the analysed region has been decreasing. It should be noted that the index in 2018, although it increased, never exceeded the limit level (100%), which indicates the possibility of reducing the level of competitiveness in subsequent periods.

It should also be noted that the strategic positions of agricultural production in the region are ambiguous. The weakest sides are vegetable production, the gross collection growth rate of which was 89.8% in 2018. For livestock products it is milk - 98.8%. The decline in the growth rate of the main livestock products is a negative factor in the development of agriculture in the region.

The region's strengths are in gross grain collection, potatoes and egg production.

Nevertheless, the region is experiencing an unsustainable trend in the production of basic agricultural products. This indicates the instability of agricultural production and the risks of production decline. In this regard, the efficiency of management decisions made by agricultural producers becomes a priority to ensure the competitiveness of the region.

2.2. Directions to improve the information system of the agro-industrial cluster

The implementation of cluster policy is one of the main directions in the system of sectoral development in the Altay region. Five cluster associations are currently operating in the region, and the formation of cluster entities is only gaining momentum. Members of cluster entities will inevitably face the need to modernize all types of resources, including information resources.

The operation of agricultural organizations in the context of the agro-industrial cluster poses new challenges to the management accounting system which aim at coherence of production plans throughout the cluster chain and optimization of the used resources and the costs involved.

One of the ways to increase the efficiency of the management solutions being developed while minimizing costs is to implement SCM - Supply Chain Management. The main idea of SCM is that long-term competitiveness is possible when managing and controlling the entire value-added chain. The mentioned methodology uses the following tools:

- electronic data exchange between the chain participants;
- analysis of business processes;
- activity-based costing (ABC);
- information support of the management.

That is, the key to SCM is fast, standardized, and secure data exchange and communication. The interaction of planning procedures throughout the product creation chain is shown in Figure 1. This interaction is based on the consistency and transparency of information flows between seed producers, agricultural organizations and processors.

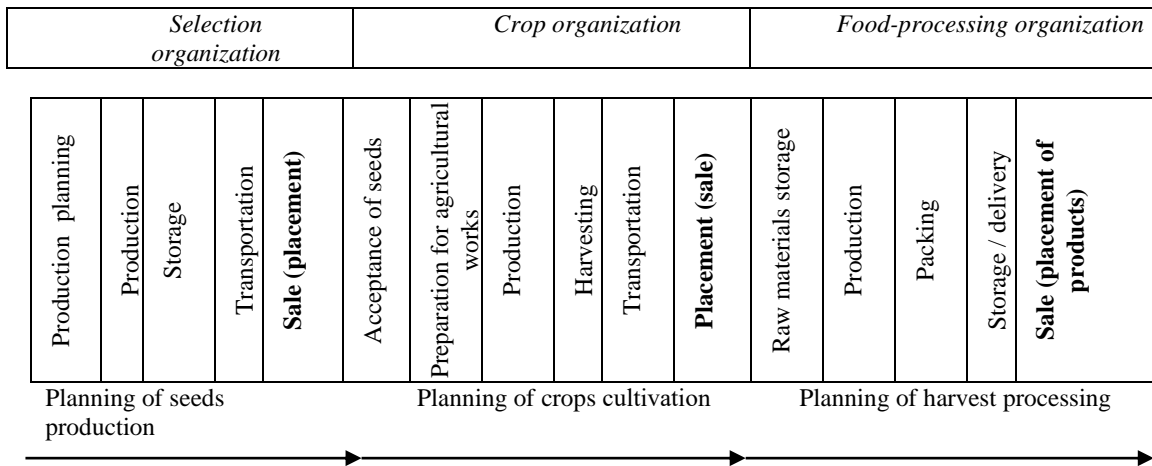


Figure 1 The Consistency Model of Chain Business Planning in Agro-industrial Cluster

The formation and control of cluster participants' (agents) indicators over the entire value-added chain should be carried out in conjunction with monitoring and evaluation of the efficiency of the costs involved. In this aspect, the implementation of the ABC technique is most promising. The effectiveness of its application in order to achieve competitive advantages of organizations in different industries is confirmed by studies of both domestic [12,13,14] and foreign authors [15]. The present study is supposed to clarify the way to use ABC for agricultural

enterprises in combination with SCM. Types of activities should be the subject to cost accounting in agricultural enterprises [16, c.4]. The first step of the ABC methodology is to define the process or activity itself, followed by the analysis and control of costs by processes (pools) of expenses. An activity can be defined as a system consisting of tasks with logical implications. Each activity has a measurable predetermined input and output and aims to create some value for the consumer. The focus of accounting on certain activities, in the authors' opinion,

leads to vertical and horizontal cost integration. Vertical integration emphasizes individual supply chain activities and identifies cost drivers. Horizontal integration is used to generate costs across variations in business processes (for example, production restrictions related to a consumer group).

ABC-data contain important information to monitor business processes throughout the supply chain, transparent planning and indirect costs control. They facilitate strategic calculation along the supply chain and the subsequent calculation of cost of products [17, p.12].

Process synchronization across the entire supply chain within the agro-industrial cluster is provided by early forecasts and accurate planning, which benefits all participants: planting material suppliers, crop organizations, processors, trade and dealer companies.

The improvement of the activity efficiency is achieved by means of the chain analysis of the processes from the supply of agricultural materials to marketing of finished agricultural products to end consumers.

The quality of the products produced is determined by the target requests of the consumer groups of the created chain. The performance of quality standards by all participants and transparency in monitoring their execution ensure successful SCM application.

3. CONCLUSION

Thus, numerous studies have established that the management accounting system of an agricultural organization should not only perform the function of recording costs, but also provide the management team with the information to justify management decisions of an operational and long-term nature [18, p. 650]. For the efficient organization of agricultural production in the conditions of the agro-industrial cluster, it is absolutely necessary to create a holistic, flexible and comprehensive information system that supports the functions of monitoring, controlling and budgeting costs. In this regard, the quality of the information used by the management to manage the agricultural enterprise within the agro-industrial cluster is of significant importance. The system of collection, synthesis and processing of this information should be presented as management accounting able to take into account the sectoral peculiarities of the organization of the production process of the produced products.

As a tool to ensure the competitiveness of agro-industrial cluster products the authors of the article proposed a comprehensive method of cost management throughout the entire production chain. This technique consists in the combination of Supply Chain Management and Activity-based costing systems methods and their adaptation to the management conditions of agricultural organizations. The main stages of the proposed methodology are standardization and the exchange of information within the established supply chain, analysis and management of the value-added processes and harmonization of budgeting procedures in the temporary series of production.

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