Foods and Raw Materials, 2018, vol. 6, no. 2

ISSN 2308-4057 (Print)
ISSN 2310-9599 (Online)

Research Article
Open Access

DOI: http://doi.org/10.21603/2308-4057-2018-2-467-473
Available online at http:jfrm.ru

Informational support as an element of state control of agriculture

Svetlana M. Bychkova[a,*], Elena A. Zhidkova[b], and Dmitrii V. Eliashev[a]

[a] Saint-Petersburg State Agrarian University,
Petersburg Highway Str. 2A., Pushkin 196601, Russian Federation

[b] Kemerovo Region Administration
Sovetsky Ave. 62, Kemerovo 650043, Russian Federation

* e-mail: smbychkova@mail.ru

Received January 17, 2018; Accepted in revised form April 11, 2018; Published December 20, 2018

Abstract: This article substantiates the importance of informational support in the agricultural sector for controlling authorities and for agro-industrial organisations in enhancing their monitoring and competitive strategies. It identifies specific features of the agricultural sector that determine its needs for information, namely its dependence on climatic conditions and the state of natural resources available to economic entities, a large territorial expanse, the location of major production facilities in rural areas, the development of interregional and international contacts, and an active growth of agricultural exports. By studying the current regulatory and legal database of the Russian Federation, the authors established the regulatory framework of a state information system and identified its key data groups. Finally, the paper looks at those information resources which were created by the federal authorities and regional bodies in the Northwestern and Siberian Federal Districts, reflecting the tasks of state informational support in agriculture.

Keywords: Agriculture, information management, agro-industrial complex, informational support, controlling, sector-specific information system, state regulation

Please cite this article in press as: Bychkova S.M., Zhidkova E.A., and Eliashev D.V. Informational support as an element of state control of agriculture. *Foods and Raw Materials*, 2018, vol. 6, no. 2, pp. 467–473. DOI: http://doi.org/10.21603/2308-4057-2018-2-467-473.

INTRODUCTION

In the context of modernising Russian economy, one of the key tasks for achieving highly competitive development indicators is to ensure a qualitatively new level of informational interaction between various economic agents and enable their integration into a data exchange system based on dynamically developing telecommunications. Today, having instant access to economic information is a prerequisite for effective interaction between economic agents, for making managerial decisions by individual organisations, their associations and state regulators, as well as for economic research.

One of the sectors of the Russian economy that could benefit from introducing information and telecommunication technologies and improving informational support of its agents is the agro-industrial complex, in particular agricultural production.

Informational support in this sector is directly related to management processes, since hardly any managerial decision can be made without having timely access to objective, complete and up-to-date information. It plays an important role in regulating and controlling business processes, establishing criteria for key performance indicators and measuring performance with a view to further improvement, i.e. in the system of controlling agro-industrial organisations [1]. In this regard, information is especially important for the subsystem of monitoring and developing competitive strategies within the framework of the project controlling system.

STUDY OBJECTS AND METHODS

This article aims to identify those peculiarities of the agricultural production sector which determine its need for informational support and to substantiate the importance of informational support in agriculture from the point of view of management and controlling systems.

Having identified the existing information resources provided by state authorities to the agricultural sector at the federal level and in the Northwestern and Siberian Federal Districts, the authors seek to show their adequacy and necessity not only for controlling, but also for stimulating agricultural production.

We believe that informational support of agriculture should be organised in accordance with its three main features to improve the performance of the agro-industrial complex. Firstly, the sector is dependent on natural phenomena and climatic conditions, the state of

Copyright © 2018, Bychkova et al. This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (http://creativecommons.org/licenses/by/4.0/), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

soils and other natural resources affecting its efficiency, and it is therefore vital for agricultural producers to have immediate access to up-to-date information on any possible changes of the above. Secondly, a considerable territorial expanse typical of most agricultural production creates an increased need for information on logistics centres, transport infrastructure, and customer location. And thirdly, it is common practice in agriculture to locate production facilities in rural areas that do not have direct access to the information and telecommunications infrastructure. Those three features of the agricultural sector should be taken into consideration when providing any kind of informational support to agro-industrial enterprises, since it is the information on the state of, and changes in, natural resources and the possibilities to overcome geographical remoteness that can enable agricultural producers to use those resources more effectively and profitably. At the same time, it is important to involve those rural areas that lack the support of information and telecommunication systems.

The on-going development of interregional and international economic relations and an active growth of agricultural exports raise the importance of providing managers of agricultural companies with access to information on prices in various territorial segments of the agricultural market, as well as information on how to reach those segments. According to V.V. Berdnikov, when studying management systems in the agro-industrial complex, it is extremely important for the researcher to 'form an integrated information field for the key groups of stakeholders and develop appropriate analytical tools that would enable them to understand the current situation in the markets, substantiate and support (or monitor) industrial, financial, investment and other kinds of initiatives aimed at achieving the best results in the current conditions' [2].

RESULTS AND DISCUSSION

Providing informational support is an important task in agriculture and, to some extent, it involves all stakeholders in the sector. All agricultural producers – from farms to large enterprises and agroholdings – take part in collecting and processing information in some form. Contractors that supply agricultural producers with goods or buy their products also need access to relevant information. Insurance companies and lenders create their own systems for monitoring sectoral information. Finally, the most important functions in providing informational support to agriculture are performed by state authorities, and a number of these functions are assigned to them by law. The main problem of all the systems for monitoring sectoral information is their inconsistency with each other, as they use different sources of information and therefore pursue different objectives. To ensure better state management of the industry, the system of monitoring indicators and other information resources should be targeted not so much at controlling the use of natural resources as at their redistribution, considering the sector's large territorial expanse and limited resources.

The Federal Law 'On the Development of Agriculture' [3] stipulates the availability of information on the state agricultural policy as one of its key principles. Therefore, a major means of implementing this policy is providing informational and consulting support to agricultural producers and other stakeholders in the market of agricultural products, raw materials and foods. Article 17 of this law sets a regulatory framework for the system of state informational support in agriculture and its functioning. According to the article, this system includes information on:

– federal and sectoral targeted programmes;
– crop and livestock sectors;
– agricultural machinery (quantity and condition), fuel supply, and energy consumption;
– chemicalisation and land reclamation;
– monitoring agricultural land;
– financial and economic standing of agricultural organisations;
– phytosanitary and epizootic situation in Russia and its current measures to identify, eliminate and prevent the spread of animal and plant diseases, agents of infectious animal diseases, and plant pests;
– employment figures and staff structures in agricultural organisations;
– food and processing industry;
– hunting resources and their use; and
– monitoring the prices of basic foods, as well as materials and resources purchased by agricultural organisations, at the markets of agricultural products, raw materials and foods.

According to the law, such information must be free and accessible to all stakeholders on equal conditions. And although it is true, the question is whether this information is really useful to all agricultural producers. Practice shows that this type of informational support is either intended for reference purposes only or it needs to be adjusted.

The RF Government Decree No. 157 of March 7, 2008 'On developing a system of state informational support in the sphere of agriculture' [4], which stipulates a procedure for creating and maintaining a system of state informational support in agriculture, defines this system as an 'integrated database of all information on the state of agriculture and its development trends, as well as information technologies and processing facilities, contained in the databases of the federal executive authorities, constituents of the Russian Federation, other state bodies and local authorities.' The purpose of such a system is to develop state information resources in agriculture, make them accessible to all stakeholders and use them as a basis for providing public services with telecommunication technologies.

The information system is operated by the RF Ministry of Agriculture, with its information resources formed by:

– the Ministry of Agriculture;
– the Federal Service of State Statistics;
– the Federal Customs Service; and
– the authorised bodies in the RF constituents and local authorities.

In addition to the data required by Article 17 of the Law 'On the Development of Agriculture' (see above), the RF Ministry of Agriculture provides information on its decisions and new regulatory acts on state support of agriculture, customs duties, tariff quotas and their application, on federal intervention stocks of agricultural products at year-end and after purchases or sales of intervention stocks, on tenders for purchasing agricultural products, raw materials and foods for public needs, on planned vs. actual production indicators for the main types of agricultural products, raw materials and foods, and their stocks at end-year, and finally on the results of measuring functional performance and efficiency of agricultural machinery and equipment relevant to the provision of state support.

All this information is available on the Ministry's website; however, if we consider informational support as an element of state control, making it accessible per se is not sufficient – it needs to be followed up to ensure that the information does reach the intended user. Unfortunately, the RF constituents are not fully responsive to this need, which leads to a certain contradiction, i.e. the Ministry of Agriculture is ready to provide important information to improve the sectoral performance, but this information gets to intended users either too late or in a distorted form (which is not reflected in their feedback to the Ministry though). We believe that this problem can be solved by making information resources clearly targeted at the intended users and reducing the amount of information open to general use. All the information provided by the Ministry should refer to particular administrative units (regions), while measuring their fulfilment of governmental assignments for food supplies should be based on the same indicators as those provided by the information resources.

At the regulatory level, priority is given to food security. Presidential Decree No. 120 of January 30, 2010 'On adopting the doctrine of food security in the Russian Federation' stresses the need for developing state information resources as part of a mechanism to ensure food security in the country. The document also stipulates the need for monitoring (along with forecasting and controlling) food security indicators at the federal and regional levels, as well as monitoring the unemployment rate and real income of the rural population in an effort to ensure sustainable development of rural areas as one of the key priorities of the state economic policy.

In addition, the decree specifies a system of indicators to be used in assessing food security, including [5]:

(a) consumption:
– disposable household resources by population groups;
– premises available for trade and foodservice (per 1000 people);
– consumption of food products per capita;
– targeted assistance to the population;
– daily caloric intake;
– the amount of proteins, fats, carbohydrates, vitamins, and macro- and microelements consumed by a person per day;
– consumer price index for food products;

(b) production and national competitiveness:
– production of agricultural and fish products, raw materials and foods;
– import of agricultural and fish products, raw materials, and foods;
– state support of producers of agricultural and fish products, raw materials, and foods (per 1 rouble of sold products);
– productivity of land resources used in agriculture; and
– food sales in trade and foodservice;

(c) management and controlling:
– volumes of foods in the state material reserve formed under the RF regulatory acts; and
– stocks of agricultural and fish products, raw materials, and foods.

Furthermore, the decree sets a criterion for assessing food security as a proportion of domestic agricultural products, fish products and foods in the total volume of commodity resources in the domestic market of the corresponding products, in particular:
– grain: at least 95 percent;
– sugar: at least 80 percent;
– vegetable oil: at least 80 percent;
– meat and meat products (in terms of the equivalent amount of meat): at least 85 percent;
– milk and dairy products (in terms of the equivalent amount of milk): at least 90 percent;
– fish products: at least 80 percent;
– potatoes: at least 95 percent; and
– salt: at least 85 percent.

The list of monitoring indicators developed by the RF Government forms a methodological basis for organising informational support. According to the RF Government Order No. 2388-r of November 18, 2013 'On adopting the list of indicators in the sphere of food security of the Russian Federation,' the state automated information system should contain the following sections of information on food security [6]:

(1) Target indicators for:
– food consumption;
– physical accessibility of food for the population;
– food independence of the Russian Federation;

(2) Monitoring indicators for:
– consumption;
– circulation of agricultural and fish products and foods;
– processing of agricultural and fish products;
– production of agricultural and fish products;
– exports and imports of agricultural and fish products and foods;
– stocks and reserves;
– population and employment figures and structure in the RF;

(3) Predictive indicators:
– scenarios for ensuring food security;
– sectoral macroeconomic indicators; and
– food balance sheets.

These sections include 129 indicators, most of which differentiated by commodity group, RF constituent or other characteristics.

These two government documents demonstrate a clear attempt at controlling the state of food security, identifying specific indicators for every activity involved in food supplies, and examining possible risks of weakening the existing positions of our government on this matter. The practical application of these documents, however, necessitates a certain adjustment by correlating information on the above indicators, which is crucial to state control of agriculture, with performance indicators of a specific economic agent and a specific constituent of the RF.

The official website of the RF Ministry of Agriculture contains a section entitled 'The list of information systems of the RF Ministry of Agriculture' including [7]:

– the functional subsystem 'The electronic atlas of agricultural lands';
– the Federal state information system for registration of tractors, self-propelled machines and trailers;
– the System for monitoring and forecasting food security in the Russian Federation;
– the System for providing public services in electronic form by the RF Ministry of Agriculture;
– the Automated information system of registers and regulatory information that includes catalogues of pesticides and agrochemicals registered in the RF, the state pedigree register, a list of seed farms, decision statements attached to applications for state registration of appellations of origin, the register of vine plantations, information on departmental checks, lists of infections and other animal diseases, information on the availability of reclaimed land and crop acreage in the RF, employment figures and staff structures in agricultural organisations, information on young breeding cattle, etc.;
– the Information system for planning and controlling the State programme;
– the Integrated information system for collecting and processing accounting and specialised reports of agricultural producers, preparing summary reports, monitoring, controlling and reviewing subsidies to the agro-industrial complex;
– the Unified automated system of veterinary accompanying documents;
– the Central analytical information system of the State informational support system in agriculture; and
– the Register of federal property of the agro-industrial complex.

The functioning of the information systems used by the RF Ministry of Agriculture can be exemplified by the System for monitoring and forecasting food security in the Russian Federation (hereinafter referred to as 'the System'), whose purpose is to organise the collection, processing and storage of monitoring data concerning:

– the state of food security in the Russian Federation;
– purchase prices for agricultural products, raw materials and foods (daily monitored); and
– imports and exports of the main product groups according to the RF Federal Customs Service.

According to the RF Ministry of Agriculture, the purpose of the System is strategic planning for the development of the agro-industrial complex (AIC), and identifying risks and threats to food security. It is therefore tasked with monitoring and analysis of food self-sufficiency and producing food balance sheets; monitoring and analysis of imports and exports according to the Federal Customs Service; and monitoring producer prices and mapping objects of high importance for ensuring food security, i.e. elevators and vegetable storehouses.

The sources of information for the System are the RF Federal State Statistics Service, which provides statistics on the AIC, the RF Federal Customs Service, which provides data on customs statistics, as well as municipal and regional authorities that control the AIC in the RF constituents and are responsible for entering data based on reports from agricultural organisations. In addition, the system contains data on food balances and prices for agricultural products (Figs. 1 and 2).

An important part of basic information in the System comes from municipal and regional authorities controlling the agro-industrial complex in the RF constituents. However, the forms they use to provide their data are of a general nature and cannot fully reflect the real situation in the sector. Some data are completely invalidated by others and therefore cannot be used by stakeholders for making managerial decisions.

The advantages of the System boil down to providing:

– informational support on food security within the System's functionality;
– real-time information retrieval;
– a possibility of obtaining consolidated information;
– an opportunity for users to develop basic individual skills and accumulate their experience; and
– a possibility of creating user reports (Fig. 2).

However, the System has a few disadvantages, namely:

– lack of information on a number of food security indicators stipulated in the RF Government Order No. 2388-r of November 18, 2013;
– non-compliance with information protection requirements;
– inadequate tools for automated data prediction;
– lack of a tool for creating imitation models to track changes in the state of food security in the current geopolitical conditions;
– low productivity and technological limitations that impede efficient state control;
– inadequate compliance with the current user needs, e.g. a lack of access from mobile devices;
– lack of a tool for publishing materials for users; and
– a need for a more user-friendly interface [8].

Further development of the System should involve taking an inventory of agricultural production, processing and storage facilities; enabling a search for commodity exchange information and data from federal authorities; improving the food safety forecasting model; and ensuring integration with other information systems of the RF Ministry of Agriculture [7, 8].

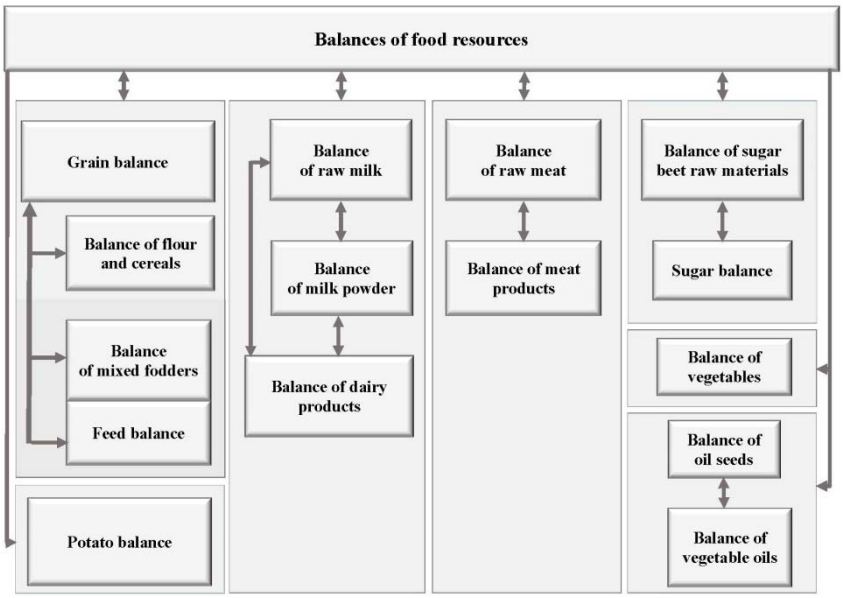

Fig. 1. Balance sheets in the System for monitoring and forecasting food security in the Russian Federation.

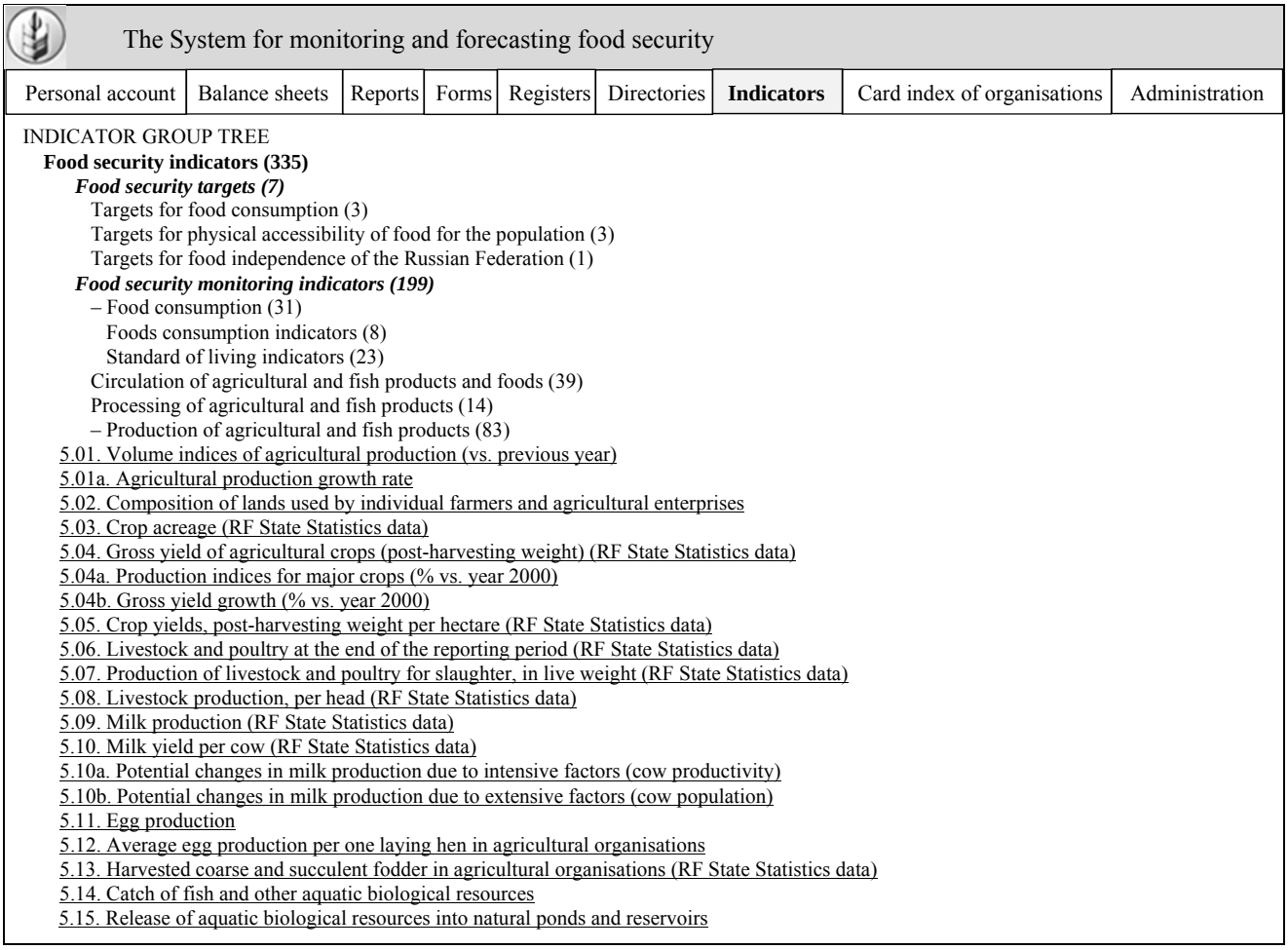

Fig. 2. An example of creating a user report in the System for monitoring and forecasting food security.

It is worth mentioning another information system, ‘VetIS’ developed by the Federal Service for Veterinary and Phytosanitary Surveillance (Rosselkhoznadzor). It is an umbrella system that covers a number of automated information systems, including [11]:

– ‘Argus’ intended to automate veterinary surveillance on the external border of the Customs Union;
– ‘Argus-Phyto’ designed to automate registration and maintenance of documents on phytosanitary surveillance;

– 'Mercury' for issuing electronic certificates for, and ensuring traceability of, goods that are supervised by the state veterinary surveillance bodies during their production, distribution and transportation through the territory of the Russian Federation to create a unified information environment for veterinary medicine and improve biological and food safety;
– 'Vesta' intended to collect, transmit and analyse data on laboratory testing of controlled product samples in diagnostic studies and research into food safety, food and feed quality, quality and safety of animal medicines, etc;
– 'Irena' for registering medicines, feed additives and GMO feeds;
– 'Assol' for collecting electronic reports from institutions accountable to Rosselkhoznadzor;
– 'Hermes' designed to automate the licensing of pharmaceutical activities and animal medicines production;
– 'Cerberus' intended to control and keep records of legally significant actions in veterinary surveillance, etc.

Apart from the databases and information resources listed above, the regional authorities responsible for the AIC in the RF constituents provide access to relevant legislation and development programmes, plans and results of state inspections in the field of seed and livestock breeding, as well as financial control. They also provide information on state support at the federal and regional levels, including subsidies and grants to businesses.

Additionally, information portals of the sectoral authorities give access to the registers of economic agents, small and medium-sized enterprises, including state support recipients, to monitoring data on regional markets for agricultural raw materials and foods, details of the progress made by the federal and regional development programmes, and up-to-date information on the AIC performance.

Some regional authorities also provide information on their state-supported crop insurance programmes, wages and vacancies in the regional agricultural sector, and plans for supplying farms with technological support and agricultural equipment.

Moreover, regional agricultural authorities have access to various kinds of information systems in their direct use, such as 1C software and Selax analytical systems designed to monitor and analyse farm performance, herd reproduction, (imported) livestock inventories, land evaluation data, annual reports, ets. [12].

Thus, the current framework of state support offers agriculture a number of functioning tools that can be used by the AIC stakeholders to monitor the sector's performance. However, it is important to understand that providing the regions with a long list of information resources not only helps them in managing the AIC, but, at the same time, hampers its controlling due to poor interrelatedness between numerous flows of information.

The current information system provides agricultural organisations with a considerable amount of disparate data about such sources of fixed and working capital as state subsidies or soft loans. Monitoring data on agricultural land, its chemicalisation and reclamation, as well as phytosanitary and epizootic information can help the managers of agricultural organisations make informed decisions on the use of biological assets, which are a key element of agricultural production and a major factor in achieving its environmental effectiveness, but they do not provide enough detail on every constituent of the RF and therefore fail to reveal their unique features.

Access to information on producers of agricultural machinery, prices for material and technical resources, livestock and seed farms, and consumer prices for agricultural products, although often poorly updated, helps agricultural organisations build good business relations with the key contractors and make managerial decisions.

Finally, information on agricultural organisations and their financial and economic performance enables managers to use a wide range of business analysis methods, namely to compare their indicators with those of competitors (external benchmarking), analyse their competitive advantages, identify key success factors and strategic economic zones, but such information needs to be verified as financial and economic performance indicators can relate to a particular agricultural enterprise and largely depend on its size.

CONCLUSION

To sum up, the needs of the agricultural sector for information are determined by its specific features, such as its dependence on natural and climatic phenomena and the state of natural resources available to economic agents, a large territorial expanse, and the location of major production facilities in rural areas with inadequate infrastructure. At the same time, some agricultural organisations and their stakeholders need informational support for controlling purposes.

These needs are reflected in the current RF legislation, where informational support is defined as one of the priorities of the state agrarian policy. Moreover, the laws stipulate the key categories of data to be included in the state information system. The main problem, however, is that the information provided by regional executive authorities does not always reflect the reality since it is presented in consolidated groups and in very general terms. As a result, such information can hardly help agricultural producers make managerial decisions.

Today, there are large information resources at the federal and regional levels that are directly related to the agricultural sector. They can be accessed mainly via the Internet, through the official website of the RF Ministry of Agriculture and its specialised information portals, as well as official websites of the Federal State Statistics Service, the Federal Customs Service, the Federal Service for Veterinary and Phytosanitary Surveillance and regional executive bodies controlling the AIC. In addition, there are some automated information systems developed by companies, rather than state authorities, that can be used for some specific purposes, e.g. to monitor livestock productivity, keep records and analyse accounting data, etc.

The abundance of information resources created for different purposes and with different requirements for data presentation leads to numerous inconsistencies in the indicators they use. Another negative aspect is that not all of the resources have a user-friendly interface or adequate integration possibilities. Furthermore, the data provided by these resources are largely collected for authorities to monitor the AIC performance, which sometimes makes them unable to adequately meet the information needs of those who make managerial decisions in agricultural enterprises.

Nevertheless, the current information system formed by the state in the agricultural sector is an extensive database that can help economic agents considerably in searching for sources of fixed and working capital, using biological assets, developing personnel motivation and management systems, and using a wide range of business analysis tools.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

The authors would like to thank all their colleagues who helped them with the research.

FUNDING

The study was supported by the Russian Foundation for Basic Research within the scientific project 18-010-01096 A ‘The neo-systemic approach as a factor of scientific justification for transforming basic foundations of controlling organisations in the agro-industrial complex.’

REFERENCES

1. Bychkova S.M. and Skobara V.V. Funktsional′nye problemy audita na sovremennom ehtape ego razvitiya [Functional problems of auditing at the present stage of its development]. *13-ya Mezhdunarodnaya nauchnaya konferentsiya po aktual'nym problemam elektronnoy priborostroyeniya* [13th International scientific conference on actual problems of electronic instrument engineering (APEIE)]. Novosibirsk, 2016, pp. 223–226.
2. Berdnikov V.V. *Kontrolling biznesa: modeli, razvitie, problemy, resheniya* [Business controlling: models, development, problems, solutions]. Moscow: Economic Newspaper Publ., 2012. 488 p. (In Russ.).
3. *Federal'nyy zakon ot 29.12.2006 goda No. 264 FZ – ‘O razvitii sel'skogo khozyaystva’* [Federal Law on the Development of Agriculture]. Available at: http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=LAW&n=286510&fld=134&dst=1000000001,0&rnd=0.6787386718669677#07763461236571845. (accessed December 2017).
4. Kolomeichenko A.S. Information support of innovative development of AIC. *Vector economy*, 2017, vol. 4, no. 10, pp. 20.
5. *Postanovlenie Pravitel'stva RF ot 07.03.2008 No. 157 ‘O sozdanii sistemy gosudarstvennogo informatsionnogo obespecheniya v sfere sel'skogo khozyaystva’* [The RF Government Decree No. 157 of March 7, 2008 (revised on June 30, 2015) ‘On developing a system of state informational support in the sphere of agriculture’]. Available at: http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=LAW&n=182205&fld=134&dst=1000000001,0&rnd=0.41221168113148665#09206530165763052. (accessed December 2017).
6. Altukhov A.I. Need of updating of the doctrine of food security of the Russian Federation. *Economics of Agriculture in Russia*, 2016, no. 1, pp. 2–11. (In Russ.).
7. Garkavy V.V. and Raeva S.A. Independence and security of Russia in grain production. *Grain Economy of Russia*, 2016, no. 6, pp. 67–71. (In Russ.).
8. *Ministry of Agriculture of the Russian Federation*. Available at: http://mcx.ru. (accessed December 2017).
9. *Ministry of Digital Development, Communications and Mass Media of the Russian Federation.* Available at: http://minsvyaz.ru. (accessed December–January 2017–2017).
10. Kibirov A.Y. Osnovnye napravleniya razvitiya organizatsionno-ehkonomicheskogo mekhanizma vosproizvodstva kapitala v sel′skokhozyaystvennom komplekse [General trends in developing an organisational and economic mechanism of capital reproduction in the agro-industrial complex]. *Theory and practice of world science*, 2017, no. 9, pp. 2–9. (In Russ.).
11. Tumansky A.Y., Prosvirnin G.S., Kan F.L., et al. Workflow in veterinary institutions with use of information and information and reference systems. *Issues of Legal Regulation in Veterinary Medicine*, 2016, no. 4, pp. 25–28. (In Russ.).
12. Fedorenko V.F. Formirovanie federal′nykh informatsionnykh resursov po innovatsionnomu razvitiyu sel′skogo khozyaystva [The formation of federal information resources for innovative development of agriculture]. *Innovations in agriculture*, 2016, vol. 2, no. 17, pp. 16–24. (In Russ.).
13. *The Pskov Region General State Department for Agriculture and Technical Supervision.* Available at: http://cx.pskov.ru. (accessed December 2017).

ORCID IDs
Svetlana M. Bychkova https://orcid.org/0000-0001-7684-9025
Elena A. Zhidkova https://orcid.org/0000-0002-7658-0254