

LEASECON 2020
International Conference «Land Economy and Rural Studies Essentials»**PROSPECTS FOR AGRICULTURAL PRODUCTION
DEVELOPMENT**

Larisa N. Kondratenko (a)*, Natalya V. Tretyakova (b), Elizaveta A. Shevchuk (c)
*Corresponding author

(a) Kuban State Agrarian University named after I.T. Trubilin, Kalinina street, 13, Krasnodar, Russia,
kondratenko.larisa@inbox.ru

(b) Kuban State Agrarian University named after I.T. Trubilin, Kalinina street, 13, Krasnodar, Russia,
n-tretkimpim@mail.ru

(c) Kuban State Agrarian University named after I.T. Trubilin, Kalinina street, 13, Krasnodar, Russia,
activovich36@gmail.com

Abstract

Sustainable development is a process of changes aimed at strengthening the current and future potential, focused on scientific and technological development, personal development and institutional variations. The economic and environmental problems and tasks of social development are interrelated. Economic prosperity, environmental quality and social justice issues should be solved in their combination. The economic aspect of sustainable development presupposes a change in production and economic activities, i.e. improvement through the use of new technologies. The ecological aspect involves the use of production technologies focused on the economical use of natural resources. The social aspect reflects social problems, improvement of the professional and educational levels. The importance of agricultural production is obvious: it is a determining and connecting factor for many other sectors of the national economy. Economic growth destroys the natural environment, leads to the environmental degradation, which prevents the economic growth. Rural development is facing numerous challenges. To solve these problems, including unemployment, poor food security and quality of food products, it is necessary to reorient agricultural production to the domestic market. Further improvement of the agriculture and ecological situation requires the use of modern technologies of soil cultivation, new irrigation systems. The work provides recommendations for improving the use of land resources, developing a model for managing the regional market.

2357-1330 © 2021 Published by European Publisher.

Keywords: Development, fertility, improvement, land management, management, resources



This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

Sustainable development should meet the needs of the population without compromising the ability of future generations to meet their own needs. Sustainable development reflects social, economic and environmental aspects of the development of society. Thus, there are three main concepts of sustainable development: socio-cultural, economic and environmental.

The economic aspect of sustainable development coordinates the transition from the existing "resource use economy" to the economy of systemic reproduction. The primary basis of the ecological concept of sustainable development is to ensure the stability of biological and physical systems (Petunina & Rudnev, 2019b). Special attention is paid to the stability of individual ecological systems, which act as the most important condition for life support.

The social aspect of sustainable development includes:

- provision of an access to land, inexpensive building materials for the poor and unemployed;
- use of local building materials that are safe for public health and harmless to the environment;
- development of energy-saving technologies based on natural resources – solar, water and wind (Prefix & Arinicheva, 2019);
- improvement of living conditions in rural areas, which can reduce the volume of population migration to big cities;
- organization of settlements in areas with the lowest risk of damage from natural disasters;
- assisting in the training of specialists in urban planning, sanitation, waste management, water quality, efficient energy and clean cost-effective transport.

2. Problem Statement

The leading prerequisite for the concept of sustainable development is the global development of international economic relations, a unified world economy aimed at both economic and social development, including the elimination of poverty, and environmental protection.

The main objectives of the state program for the development of agriculture for the period up to 2020 are:

- improving the living standards;
- employment of citizens living in rural areas;
- increasing the efficiency of regulation of domestic and foreign agricultural markets;
- stimulating the growth of production of agricultural products, including meat and dairy cattle breeding;
- creating conditions for the preservation and restoration of soil fertility, agricultural land reclamation (Petunina & Rudnev, 2019a)
- technical and technological improvement, stimulation of investment activities in the agricultural industry (Pyankova, 2017);
- support for small businesses (Arinichev et al., 2017).

3. Research Questions

This article examines the main concepts of sustainable development: socio-cultural, environmental and economic. The subject is:

- economic activities of people, principles for careful allocation of resources, resource-saving technologies, engineering and economic solutions which ensure the environmentally friendly sustainable development.
- the structure of relations between the environment and humans aimed protect the natural environment and vital interests of humans from negative impacts of economic activities and technogenic emergencies.

4. Purpose of the Study

The work gives recommendations on the organization of the national economic complex, the effective and careful use of land resources in order to increase the economic effect.

5. Research Methods

Studies of the state of lands, planning and organization of their rational use are the purpose of land management. In other words, it is a set of economic, engineering, technical, environmental and legal measures of land management and protection. Land management projects determine the economic activities of enterprises for the future.

Economic and mathematical modeling, whose methods are subject to the following requirements, is a universal and effective tool for understanding the internal laws inherent in the phenomena and processes under consideration.

1. Quantitative and qualitative analysis.

The basis of economic and mathematical modeling is created by quantitative methods of analysis, used to study design objects, identify various dependencies and relationships, perform mathematical analysis using variables, equations, and inequalities (Vakhrusheva & Bukhartsev, 2019).

2. Accounting for economic, technological, land management, technical and other conditions.

For example, economic conditions are: the size of industries, the combination of industries, the nature of resources, the volume of production, the conditions for the sale and distribution of products; technological conditions - agrotechnical features of agricultural crops cultivation, veterinary and zootechnical requirements for animal breeding; land management conditions - location of settlements, land tracts, land arrangement, and land quality (Pyankova & Tretyakova, 2019).

3. Using a reliable information base in accordance with the objectives of the problem being solved and the computational accuracy (Goldman, 2018; Molchanova, 2017; Reznichenko, & Pyankova, 2017).

It is important to take into account which indicators can be obtained based on the available statistical, experimental and regulatory materials.

4. Analysis and adjustment of models and results of solutions obtained by the mathematical methods to bring the mathematical and economic optima into conformity (Kuzmina et al., 2020).

5. Unification and, if possible, simplification of models in order to solve the land management problem with a given accuracy.

The maximum simplification and unification are carried out when maintaining a sufficient number of variables and constraints, which will make it possible to obtain an acceptable solution. You should not create cumbersome mathematical models, because the opposite effect is possible (Varakin & Arinicheva, 2020). The results obtained should be carefully analyzed.

6. Application of mathematical methods and models. The main task is to determine the most rational options, which is feasible thanks to economic and mathematical methods (Ponamarev & Vakhrusheva, 2019).

6. Findings

In recent years, Russia has experienced the invasion of foreign technologies in agricultural production. Almost every region is divided into districts in which German, French, and Italian technologies are applied with the complex mechanization of cultivation and harvesting of agricultural crops. However, such agricultural production technologies provide for the use of their seeds and means of protection, which leads to the total dependence on foreign beneficiaries. Agricultural production is a determining and connecting factor for many other sectors of the national economy. With the existing structure, seed growing, plant protection, and production of agricultural machinery are poorly developed in Russia.

It would be advisable to focus on partners that allow the implementation of the integration and development of their own technological complex of agricultural production. It is appropriate to mention the positive experience of the Soviet economic complex. The advantages of cost planning, forecasting and staff training are indisputable.

The next example concerns grain exports. Krasnodar Territory exports 10 million tons of grain. The state does not receive special income from taxes when exporting grain. However, such a ratio between consumption in the domestic market and exports creates an imbalance in the economy and dependence on the world grain market. Moreover, wheat is a raw material for the processing industry. Lobbying for an increase in grain exports increases the share of grain crops in the crop rotation, intensified exploited land resources and decreases the share of grain crops that contribute to the structuring and natural enrichment of soil, which will inevitably lead to a decrease in fertility.

The reorientation of agricultural production to the domestic market will make it possible to develop the processing industry, increase the number of jobs, ensure food security, control the quality of food products, and balance the pricing policy. In addition, the introduction of economically and environmentally efficient crop rotations while maintaining soil fertility should be beneficial for land users.

Further optimization and intensification of agriculture using digital technologies and precision farming, taking into account the heterogeneity of soil, will be more futile in comparison with the

optimization of regional agricultural complexes focused on the Russian domestic market. This, in turn, will stimulate the development of the processing industry and animal husbandry.

The state program for the development of agriculture and regulation of agricultural markets, raw materials and food is aimed at:

- sustainable development of rural areas;
- creation of general conditions for the agriculture;
- development of the most important subsectors;
- financial stability of farms;
- regulation of agricultural markets.

In order to further improve the agriculture and the ecological situation, it is necessary to apply modern technologies of soil cultivation and develop new irrigation systems.

Indeed, the progress of new production materials and equipment, as well as changes in the pricing policy, make it possible to further improve irrigation systems. For example, in the rice irrigation systems, it is possible to replace the irrigation part of open canals made in an earthen bed with plastic pipes with gravity water supply. This change in the rice irrigation system design will increase the land use factor (CUI), reduce filtration losses of water and operating costs by eliminating the maintenance costs for the open irrigation canals. The intra-check pipeline will allow a uniform water flow without soil erosion and high water consumption, i.e. it will allow us to fill the checks with water in a short time.

These activities can improve the ecological situation and save water resources. In addition, they will increase the culture of agriculture and simplify the accounting of water consumption (Spitsov et al., 2020).

7. Conclusion

The ideas of sustainable development as a model for the efficient use of resources, whose purpose is to satisfy human needs while preserving the environment, are consonant with Russian mentality and traditions. To achieve success in understanding, methodological support and practical implementation of the principles of sustainable development, it is necessary to use knowledge about the structure and functions of the socio-ecological and economic systems. The most important factor in solving environmental problems is science (Kondratenko & Shevchuk, 2016).

In the agriculture, it is necessary to apply an integral approach based on the concepts of accessibility to each person and reflecting cultural traditions of the people. It is advisable to develop and implement scientifically grounded standards, new environmentally friendly technologies, programs warning about irreversible changes.

References

- Arinichev, I. V., Bogdashev, I. V., & Arinicheva, I. V. (2017). A strategic approach to managing small and medium-sized enterprises. *Economics and Entrepreneurship*, 1(78), 592-596.
- Goldman, R. B. (2018). *Mathematical model of plant seed stimulation. The results of research work for 2017* (pp 229-230). Krasnodar: Kuban GAU.

- Kondratenko, L. N., & Shevchuk, E. A. (2016). *The advantage and popularity of the applied bachelor's degree as a higher education. Regional features of market socio-economic systems (structures) and their legal support* (pp. 531-532). Moscow University. S. Yu. Witte.
- Kuzmina, E. V., P'yankova, N. G., Tret'yakova, N. V., & Botsoeva, A. V. (2020). Using Data Analysis Methodology to Foster Professional Competencies in Business Informaticians. *European Journal of Contemporary Education*, 9(1), 54-66.
- Molchanova, E. V. (2017). Innovation and information technology: search for ways of practical implementation. *Concept*, 31, 656-660.
- Petunina, I. A., & Rudnev, S. G. (2019a). *Energy efficient basic tillage. The role of agrarian science in sustainable development of rural areas* (pp. 177-180). Novosibirsk: IC NSAU "Golden Ear".
- Petunina, I. A., & Rudnev, S. G. (2019b). *Multilayer crumbling of the soil layer during plowing. Scientific support of the agro-industrial complex* (pp. 199-200). Kuban GAU.
- Ponamarev, V. E., & Vakhrusheva, N. V. (2019). *The mathematical component of the analysis and forecasting of the rational use of land resources*. Student scientific work of the Faculty of Land Management (pp. 3-11). Kuban SAU.
- Prefix, I. E., & Arinicheva, I. V. (2019). *On the problem of using natural resources. Youth and Science: A Step to Success* (pp. 170-174). University Book.
- Pyankova, N. G., & Tret'yakova, N. V. (2019). Mathematical modeling of agroecosystems. *Economics and Management: Key Problems and Development Prospects* (pp. 210-214). Krasnodar; Federal State Budgetary Institution "Russian Energy Agency" of the Ministry of Energy of Russia Krasnodar Center for Scientific and Technical Information - branch of the Federal State Budgetary Institution "REA" of the Ministry of Energy of Russia.
- Pyankova, N. G. (2017). Optimization of business processes of the organization's procurement activities. *Seventeenth Kaigorodov Readings. Culture, science, education in the information space of the region* (pp 188-191). Krasnodar: Krasnodar State Institute of Culture.
- Reznichenko, A. M., & Pyankova, N. G. (2017). Information technology in small business. *Scientific support of the agro-industrial complex* (pp. 277-278). Kuban GAU.16.
- Spitsov, D., Nekrasova, L., Kondratenko, L., Pushkin, S., & Klyuchnikov, D. (2020). The Effect of Agricultural Practices on the Drinking Water Quality: A Case Study. *Asian Journal of Water, Environment and Pollution*, 17(2), 73-80.
- Vakhrusheva, N. V., & Bukhartsev, M. S. (2019). *Methods for mathematical modeling of problems in the agricultural sector. The role of agrarian science in sustainable development of rural areas* (pp 313-316). IC NSAU "Golden Ear".
- Varakin, G. S., & Arinicheva, I. V. (2020). Mathematical modeling: its application in industry and agriculture. *Modern intellectual transformation of socio-economic systems* (pp. 14-18). Institute for Research and Development of Professional Competencies.