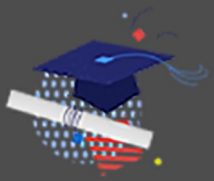
SUSTAINABLE DEVELOPMENT: MODERN THEORIES AND BEST PRACTICES



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Sustainable Development: Modern Theories and Best Practices

Materials of the Monthly International Scientific and Practical Conference (February 24-26, 2021)

Tallinn
2021

Sustainable Development: Modern Theories and Best Practices : Materials of the Monthly International Scientific and Practical Conference (February 24-26, 2021) / Gen. Edit. Olha Prokopenko. Tallinn: Teadmus OÜ, 2021, 79 p.

ISSN 2733-2942

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The collection consists of materials from the Monthly International Scientific and Practical Conference “Sustainable Development: Modern Theories and Best Practices”. They represent scientific research results in such scientific areas as financial and economic, managerial and legal, social and cultural, ecological and technical issues of sustainable development on local, regional and international levels. It is for scientists, lecturers of higher education institutions, students, graduates, and everybody interested in modern scientific and practical sustainable development problems.

Keywords: Sustainable Development, Financial Issues of Sustainable Development, Economic Issues of Sustainable Development, Managerial Issues of Sustainable Development, Legal Issues of Sustainable Development, Social Issues of Sustainable Development, Cultural Issues of Sustainable Development, Ecological Issues of Sustainable Development, Technical Issues of Sustainable Development, Regional Features of Sustainable Development, International Cooperation for Sustainable Development.

ISSN 2733-2942

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Zhaoli Wang, Jun Li, Chengguang Lai, Raymond Yu Wang, & Xiaohong Chen, Yanqing Lian (2018). Drying tendency dominating the global grain production area. Global Food Security, 16, 138-149.

INTRODUCTION OF SPRINKLER IRRIGATION IS A GUARANTEE OF STABILITY OF DEVELOPMENT OF THE SOUTHERN REGION OF UKRAINE

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The article analyzes and shows aspects of sustainable development of agriculture in the southern region of Ukraine on the basis of irrigated agriculture. The advantages and disadvantages of modern irrigation systems in production are presented. It has been determined that modern sprinkler systems require the introduction of energy-saving technologies based on the automation of the irrigation process and autonomous renewable power sources.

Key words: *regional development, agriculture, irrigation, energy and resource conservation.*

Agriculture in Ukraine is a key sector of its economy. The main branch of specialization of the country's agriculture is crop production, especially technical and fodder (sugar beets, sunflowers, etc.).In terms of their physical, mineralogical, chemical and agrochemical properties, the Ukrainian black lands are considered the best in the world.

In Ukraine, black land covers an area of 60.4 million hectares, of which almost 42 million hectares (about 69 %) are cultivated, of which about 33 million hectares of black land, i.e. one third of Europe’s arable land

According to FAO, Ukraine's agricultural potential can feed 450-500 million people. However, today its capabilities are used only by a third. This is due to a number of factors, primarily related to climate change, which is characterized by virtually unchanged rainfall, causing the growth of drought and the development of desertification in the steppe zone.

Since 1991, the area of dry and very dry zone in Ukraine has increased by 7%. At the same time, the area with excessive and sufficient atmospheric moisture decreased by 10% and occupies only 7.6 million hectares. Thus, almost 25 million hectares need constant irrigation.

According to forecasts, further climate change will worsen the conditions of natural moisture supply.

As a result, the role of irrigation in agricultural production will only increase. Irrigation, in the complex of water land reclamation, is one of the global strategic directions of intensification of agriculture in different countries, including Ukraine,

ensuring sustainable production of crop products, especially in years with adverse climatic conditions.

Food security, economic and environmental aspects depend to a large extent on the efficient use and conservation of irrigated land. In arid regions of the world, including the Southern Steppe of Ukraine, the most effective and reliable measure to stabilize agriculture is artificial wetting, which stabilizes crop productivity and prevents a catastrophic decline in gross crop yields in years with adverse weather conditions (no precipitation, high rainfall). air temperature, dry winds, etc.)

In the agro-economic aspect, the efficiency of production in irrigated agriculture depends on two groups of factors. The first group includes factors that are formed at the level of the state, local governments, local features of relations with public authorities and do not depend on producers. The main ones are: price, credit and tax systems, support for the industry at the state and regional levels, regulation of property relations, development of science and others.

The second group includes factors that depend directly on the manufacturer. These are the development, improvement and implementation of irrigated agriculture systems, modern irrigation methods, new agricultural and irrigation equipment, competitive crops, high-yielding, adapted to irrigation varieties, fertilizer and plant protection systems, soil moisture control and timely irrigation.

The development of irrigation in Ukraine requires a systematic approach with mandatory scientific justification and support.

Research on improvement taking into account energy, resource and environmentally friendly technologies and optimization of irrigation systems are priority areas of research in the Mykolaiv region, namely in the Mykolaiv National Agrarian University.

Currently, sprinklers are the most promising for the south of Ukraine, but in accordance with current regulations in Ukraine: the Verkhovna Rada of 22.02.2001. № 2274 – 111 (2274 - 14) "Energy Strategy of Ukraine for the period up to 2030"; Of the Cabinet of Ministers dated 03.04.2006 № 412 "On ensuring the efficient use of energy resources" and dated 22.10.2018 № 935 "On the organization of state control over the efficient (rational) use of fuel and energy resources", the industry of Ukraine must make a significant contribution in solving energy conservation issues and creating their own competitive products.

The existing irrigation systems in Ukraine, which currently cover an area of 2.17 million hectares, are operational and do not meet modern requirements for technological and operational reliability. Existing irrigation systems use mainly obsolete types of multi-part sprinklers, which have exceeded their planned service life by 2 times. Today, about 5.5 thousand sprinklers are in working order, which can provide irrigation on an area of about 600-700 thousand hectares. Today, foreign companies have started to operate actively on the Ukrainian market: Sigma (Czech Republic), R. Bauer (Austria), Valley (USA). Among the proposed models - stationary sprinkler systems with circular and frontal trajectories, a wide range of drum sprinklers. Such systems are characterized by wide functionality, provide sprinkling at low water pressure, supply through the pipeline with water intake from the open or closed network, as well as the use of a diesel generator or electric drive makes the system independent in use and reduces energy use.

At the same time, along with the positivity of solving this issue, there are also negative factors: the high cost of the latest sprinkler systems and complexes; lack of

regional centers for providing information on agroecological quality of rain, uniformity and quality of irrigation, organization of erosion-safe irrigation; lack of specialists in land reclamation and optimization of water resources in the south of Ukraine; lack of own production of competitive energy-efficient sprinklers.

These shortcomings lead to the environmental problem of irrigation, unregulated use of natural resources, energy consumption, increasing the cost of agricultural products and reducing guaranteed yields.

Sprinklers are a significant reserve for reducing water consumption, energy conservation and fertilization, as losses in the irrigation system are over 30%. Therefore, increasing the energy efficiency of sprinklers by even 10% is justified. One of the ways to solve the problem of reducing the cost of production is the introduction of energy-saving systems and complexes in the irrigation system.

A promising direction is the creation of new irrigation systems and sprinklers of a new generation based on autonomous renewable power sources, automated irrigation systems. Such systems and machines must be low-pressure, provide high-quality irrigation by optimizing the algorithm of water supply with simultaneous supply of water, fertilizers and chemical ameliorants for soil structuring.

Conclusions. Sustainable development of the agro-industrial complex in the southern region of Ukraine is possible under the following conditions: stimulation of higher education institutions for the training of quality specialists to work in the agro-industrial complex; creation of regional advisory centers to provide information to farmers on the latest technologies for growing agricultural products, agroecological quality of rain, uniformity and quality of irrigation, organization of erosion-safe irrigation, which will increase yields and product quality; creation of own production of competitive, energy-efficient equipment for irrigation systems of sprinklers; introduction of automated irrigation systems and energy-saving technologies based on autonomous renewable energy sources.

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Scientific edition

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Publisher:
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