

THE OPTIMAL RATIO BETWEEN THE PRODUCTION AND THE ECOLOGY
IN TERMS OF SUSTAINABLE RURAL DEVELOPMENT

The actual state of operation of agricultural production, rural social sphere as well as condition and problems of the environment are analyzed. Economic mechanisms to ensure environmental safety in rural areas of Ukraine are proposed.

Keywords: agricultural policy, production, ecology, environment, management, rural, agricultural products, sustainable development.

Лутвин Ю. О. Оптимальне співвідношення між виробництвом та екологією у концепції сталого розвитку сільських територій

Проаналізовано фактичний стан функціонування сільськогосподарського виробництва, соціальної сфери села, а також стан і проблеми навколишнього природного середовища. Запропоновано економічні механізми забезпечення екологічної безпеки сільських територій України.

Ключові слова: аграрна політика, виробництво, екологія, природне середовище, регулювання, сільська територія, сільськогосподарська продукція, сталий розвиток.

Лутвин Ю. А. Оптимальное соотношение между производством и экологией в концепции устойчивого развития сельских территорий

Проанализированы фактическое состояние функционирования сельскохозяйственного производства, социальной сферы села, а также состояние и проблемы окружающей среды. Предложены экономические механизмы обеспечения экологической безопасности сельских территорий Украины.

Ключевые слова: аграрная политика, производство, экология, природная среда, регулирование, сельская территория, сельскохозяйственная продукция, устойчивое развитие.

Introduction

At the current stage of the development of Ukrainian economy one of the main areas of regulation of rural development is the government regulation, based on which the program-target approach is being approbated and mechanisms of ensuring sustainable development of rural areas are being approved.

Overcoming the problems of low efficiency of agricultural policy, deficit in the country's budget for social spending, slow formation of rural self-government, distant location of the farmers from the markets for agricultural products, limited access to logistical, financial and information resources requires substantial strengthening of the state influence on rural areas. Regulation of the rural development differs significantly from the regulation of agriculture, because we are talking not about the industry sector, but the component of territorial organization of rural society, therefore other methods and approaches are required. Thus, rural areas should be singled out as an independent object of state regulation.

Analysis of recent research

Significant contribution to the formation of ideas about approaches of managing the country's regional development, principles of designing and implementation of regional policy, identifying features of regional policy and the policy of the regions, identifying their subjects and objects made such leading scientists as E. B. Alayev, O. Amo-sha, G. V. Balabanov, P. T. Bubenko, Z. S. Var-naliy, S. G. Fields, Z. V. Gerasymchuk, A. P. Go-likov, G. K. Provinces, M. I. Lower, L. M. Zait-sev, Y. Ipatov, B. T. Kliyanenko, V. S. Kravtsiv, A. P. Kraynyk, N. G. Kuznetsov, L. M. Kuz-menko, A. G. Mazur, T. S. Maximov, A. Mar-shall, M. G. Chumachenko, B. M. Shtulberh, M. D. Yankiv and others. Scientists who research the development of rural areas are M. K. Orlatyy, I. V. Prokop, P. T. Sabluk, V. Yurchyshyn and others.

Statement of research objectives

– to analyze the actual state of functioning in agricultural production, social sphere of rural areas as well as the state and problems of the environment;

– to offer economic mechanisms in order to ensure environmental safety in rural areas of Ukraine.

Results

Under certain requirements, the agricultural sector makes a significant contribution to the vitality of rural areas, preserving the agricultural landscape and cultural heritage, to the preservation of agro biological diversity. Agriculture plays a vital role in maintaining the soil fertility and protection of land against erosion and other negative effects of natural and man-made disasters.

Pollution and soil erosion. Territories, which are not affected by human activities, remain not so much in the world- only 39% of the total area of the Earth [6, p. 153].

For example, in the Russian Federation, whose total area is 17.1 million km², the area of untouched by the economic activity land is 7.8 million km² (41-47 % of the total area); in Canada respectively – 9.98 million km² and 6.4 million km² (64.1 %); in Australia – 6.2 million km² and 2.5 million km² (40.3 %); in Brazil – 8,460,000 km²; and 2.4 million km² (28.4 %); in China – 9.33 million km² and 1.8 million km² (19.3 % of the total area). In Ukraine, whose total area is 603.5 thousand km², the area which is preserved in its natural state is only 50 km², or 8.3 % of the total area and this margin is very close to be critical [4, p. 43].

Nowadays the state of land in Ukraine in general terms can be described as unsatisfactory. Agriculture remains extensive with a very high level of agricultural development of the territory and, in particular, its plowedness.

The high rates of tilled soil of agricultural land under the circumstances of low yields indicate the inefficient use of land resources and increasing of water and wind erosion. In some regions the level of agricultural tilled soil land even exceeded 90 % (Kirovograd – 95.9 %, Kherson – 94.0 %, Cherkasy – 93.6 %, Dnipropetrovsk – 92.9 %, Mykolaiv – 90.8 %, Vinnytsia – 90,5 %) [5, p. 14].

The main changes in agricultural soils are related to the mechanical application of a fertilizer on them. Plowing the soil changes its profile, destroys its structure, leading to depletion of the upper horizons by water and wind erosion while agricultural machines compact the soil. Mineral and organic fertilizers also have a great influence. They are sometimes excessive and pollute groundwater and surface water. Particularly it is the case for developed economies, where inten-

sive technologies are applicable and fertilizer is being brought more than 100 kg / ha.

Obtaining high yields is currently impossible without the use of different pesticides to protect plants. Now there is a tendency of reducing their use because many pests have adapted to them. There is also a loss of beneficial soil microorganisms, contamination of finished vegetable production and accumulation of harmful substances in the water, animals and humans.

One of the main conditions of soil contamination from pesticides is through creating a less toxic volatile compounds and the reduction of norms of chemical treatment. There are ways to reduce the volume of processing plants by pesticides without the loss of efficiency:

- A combination of agro technical pesticides with biological ways of combating pests. The aim of it is not to completely destroy the pests, but to protect the agricultural spices;

- The use of new pesticides. The use of new forms of pesticides allows to reduce the rate of active substance and to minimize soil contamination;

- An application of 2-3 pesticides with varying mechanisms of action in turn. This prevents the adaptation of pests.

The low culture of livestock farming leads to an accumulation of huge amount of manure near cattle farms, which is a dangerous factor in contamination of soil and water. They pile up a large amount of harmful bacteria which may be causative for dangerous diseases – tetanus, brucellosis, anthrax, tuberculosis and others.

To particularly dangerous consequences of the negative impact of humans on earth belongs accelerated erosion. Under erosion one should understand processes of destruction and removal of fertile layer of water or wind. Natural erosion occurs very slowly, and the processes of leaching and soil blowing are balanced by natural soil. Under the condition of accelerated erosion the damage on soil processes many times faster. Natural erosion processes and human activities contribute to the economic loss of humus layer, reducing the thickness of which on 1 sm leads to the yield losses of 1 kg / ha. In Ukraine for the past 30 years humus content has decreased by 30 %. The situation is being complicated by the fact that for the recovery of the soil layer with the thickness of 1 cm by natural way at least 100 years are needed [1].

Water pollution. An untreated effluent of agricultural production is one of the sources of water

pollution. Wastewater contains dangerous chemicals, pathogens, insecticides and herbicides. This problem provokes worries about health and lives of the population. An environment is so much polluted that it is impossible to completely eliminate the infection. Pesticides and fertilizers used in agricultural production are washed into rivers, lakes, seas with rain water and become the food for bacteria. Bacteria consume dissolved oxygen in water, which results the start for a suffocating of fish. Untreated sewage is appearing into the rivers and to the sea, which causes diseases, and sometimes even death of animals and humans.

Unfortunately our state, being in poor conditions in regards to renewable water resources, does not implement stringent target programs for the conservation and economical use of drinking water. It is known that out of 50 water objects in our country, in which hydro biological and chemical research reveals had been made no watercourse or lake, which would correspond to the requirements of the background state or could be characterized as «pure water» have been found [4, p. 47].

Despite to the decline in agricultural production, which led to some reduction in the amount of the wastewater, water objects of Ukraine were contaminated mainly by nitrogen compounds, petroleum products, heavy metals (increase of these substances has been recorded in the basins of the rivers Danube, Dniester, Southern Bug, Seversky Donets). Due to an unfavorable situation in the sphere of public water supply and water conservation, Ukraine's population is exposed to a risk of various diseases associated with the consumption of a poor quality water and products made from fish and crustaceans, which are being fished in polluted waters, rivers, estuaries and seas. For water conservation and efficient use of water in rural areas the necessary measures should be ensured:

- Provision of rural population with quality drinking water;
- State regulation of water supply;
- Secure and reliable water supply.

Environmental pollution by solid wastes. Rural areas are polluted by construction, industrial and household waste; scrap metal, packing materials, glass, most of which are chemically inert and don't have an ability to self-utilize. In the rural area there are 12,254 unorganized landfill of waste, 8,220 unorganized dumps, which occupy the territory of 4,722 hectares and 2,108 water objects contaminated by solid waste [2].

In Ukraine there are 5,913 villages that have unorganized dumps of the waste of industrial, residential and construction matter; 4,045 villages where the stations (points) for fueling cars and tractors are situated; 2,847 villages with the storage of fertilizers and pesticides; 1996 villages with contaminated surface water bodies.

Air pollution. Atmospheric air is polluted by the oxides of carbon the most. The main «suppliers» of carbon monoxide in the world are the U.S., Russia, Japan and Germany. Ukraine pollutes the air relatively a little, but it is not due to the observance of the environmental norms, rather the crisis of production in virtually all sectors of the economy.

Agriculture in comparance with other industries pollutes the air slightly. Emissions of harmful substances into the atmosphere from stationary pollution sources in agriculture in 2009 were up to 43.5 thousand tons, which is less than 1 % of the total emissions for all types of the economic activity – 4448.9 thousand tons [5, p. 18].

But still is the periods of mass introduction of herbicides and pesticides the majority of the farmers (not to mention the direct perpetrators) are at risk of harming the health. This especially concerns large agricultural enterprises working on the base of new intensive technologies.

Based on all the above, it is clear that agriculture makes a huge impact on the environment, including human health. And the impact may be both positive and (is is more likely) negative.

Despite the fact that the agricultural production is based on the use of cultivated plants and domestic animals administering this branch is not as easy as it may seem. The criterias for the optimal control are not only the maximization of the efficiency of agricultural production, but also the prevention of environmental pollution, the support of the normal functioning of natural landscapes.

Sustainable rural development implies the provision of targeted social mobilization in social, economic and environmental spheres. If the social development of rural areas should ensure the uniform growth of positive social indicators (living standards, education, health, etc.), the economic issues of rural areas just have to provide the necessary level of income for the social functioning of the village. It means that these two areas are complementary between each other and there is a direct proportional relationship: a higher level

of economic development leads to a stable quality of life of citizens and ensures their fuller infrastructure. Instead of that, the relationship between economy and ecology is inversely proportional: the rapid development of the economy leads to the environmental crisis and on the contrary, the crisis in the economy (such as in the 90s of the last century) – reduces the anthropogenic impact on nature: environmental situation improves. The interaction between ecological and economic spheres of rural areas in a simplified form can be understood as the relationship in order to involve natural resources into productive activities and environmental pollution. That is why it is very important for the sustainable development of rural areas for the optimal ratio (balance) between the production and the ecology to be found.

The strategy for sustainable rural development should include mutually agreed set of economic and environmental measures in order to achieve the main goal – the optimization of a sustainable ecological and economic mechanism of the respective territories.

One of the directions for the salvation of the environmental problems in rural areas should be the integration of environmental policy into the strategy of socio-economic reforms by the means of developing environmental programs as part of the economic and social development of rural areas.

Targeted environmental programs should be designed on a resource-territorial principle, which will help to generate and evaluate activities as of regarding specific rural and also resource areas of environmental protection. While working on the environmental programs for the rural area primary attention should be paid to the most significant and immediate measures, which have a significant environmental effect.

Environmental problems can not be separated from the economy – they are inextricably linked. We offer the following economic mechanisms of ensuring environmental safety in rural areas of Ukraine:

1. Environmental taxes. For the tax base it is intended to consider the amounts of pollution in rural areas. In order to simplify the administration of these taxes they can be included into the price of fertilizers, herbicides, pesticides and other resources which are used in agriculture and are environmental pollutants. Revenues from these taxes should be allocated to the local budgets and used only to financing environmental programs.

2. Licenses on pollution. This is the introduction of the market quotas for the pollution in the rural

areas. For example the village council may sell the pollution limits for agricultural, industrial, construction, transport, service and other companies operating in its territory or in the immediate vicinity. If the company has leveraged its limit, the quota can be outbided from other business entity. That means that for the company that uses new energy and low-waste technology this is not only the savings of the costs, but also additional revenues.

3. The system of benefits for the environmentally sound production. Among them separately can be distinguished:

- Higher purchase prices for agricultural products, grown without pesticides (under the circumstances of higher income of the population the demand for such products will expand)

- Tax incentives;

- Accelerated depreciation of capital goods;

- Subsidy for the payment of interest on loans for the implementation of environmentally sound technologies and acquisition of appropriate equipment.

Besides economic mechanisms of ensuring the environmental safety, one must also use the legal, technical, medical, humanitarian activities of government influence, which in this case is beyond the scope of our study. The combination of these measures is the national system of environmental safety.

The state system of ecological safety of Ukraine is a set of state measures (legal, economic, technical, humanitarian, medical), aimed at maintaining a balance between its ecosystems and man-made and natural loads [3, p. 11].

For the realization of the state system of ecological security various ministries, departments, institutions and organizations, and local authorities should be involved. Based on the general state of modern ecological and economic mechanism for the rural development, we can conclude that the environmental situation in Ukraine puts an urgent ecological efficiency and economic development of rural areas on its agenda.

Conclusions

Thus, the relationship between the economy and ecology is inversely proportional: the rapid development of the economy leads to an environmental crisis and on the contrary, the crisis in the economy is reducing the anthropogenic impact on nature: environmental situation improves. The interaction between ecological and economic spheres of rural areas in a simplified form can be understood as the relationship in order to involve natural resources into productive activities and environmental pol-

lution. It's very important for the sustainable development of rural areas to find the optimal balance between production and ecology.

Environmental problems cannot be separated from the economy – they are inextricably linked.

Therefore, we proposed economic mechanisms of ensuring an environmental safety in rural areas of Ukraine. Besides the economic mechanisms one must also use the legal, technical, medical and humanitarian measures of state influence.

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