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*O. M. Beketov National University of Urban Economy in Kharkiv***IMPROVING THE COORDINATION AND EFFECTIVENESS OF AN INTEGRATED APPROACH TO MANAGEMENT OF LAND AND OTHER NATURAL RESOURCES**

*The development of new, more effective methods of caring for soil conservation, pest control, management, conservation and improvement of soil fertility, reduce the anthropogenic impact on the soil and reduce its pesticides, agrochemicals, sulphates, heavy pollution of metals. The problems of the deterioration of water bodies, resulting in flushing pollutants into rivers, lakes and reservoirs. In reservoirs, lakes and rivers the small levels of pollution, especially nutrients that significantly accelerate the processes of water bloom is much higher than in large flowing streams. Because of the "blooming" of water, quality is deteriorating, which complicates the use of water bodies for drinking water and recreation. Water bloom, dense aquatic population of microscopic photosynthetic organisms produced by an abundance of nutrient salts in surface water, coupled with adequate sunlight for photosynthesis. The microorganisms or the toxic substances that they release may discolour the water, deplete its oxygen content, poison aquatic animals and waterfowl, and irritate the skin and respiratory tract of humans. The framework of research authors suggested new methods of management and other natural resources, a regional program to improve the state of natural resources.*

**Key words:** soil cover, management of projects and programs, management of natural resources, degradation, erosion.

**Statement of the problem**

The problem of land protection, the fight against their degradation raised today to the level of major, global, since land degradation occurs all over the world. The main criterion of land degradation is soil cover, as one of particularly vulnerable objects of nature. The results of monitoring of soils indicate that in the last decade soil has deteriorated and if we do not take the necessary measures degradation processes will continue and fertile black soil will degradate to unproductive, degraded one. Thus, the average annual soil loss from water and wind erosion accounted for 15 t/ha. This means that the soil cover of the country loses annually about 740 million tons of fertile soil, which contains about 24 million tons of humus, 0.7 million t of mobile phosphates, 0.8 million tons of potassium, 0.5 million tons of nitrogen and large amounts of trace elements.

The Message of the EU Commission "Towards a thematic strategy of soil protection" the 8 main threats to soil degradation are identified: erosion, quantitative and qualitative reduction of organic matter (humus), contamination, salinization, compaction, landslides and floods, loss of biological diversity, covering the soil [1]. Therefore, the problem of soil conservation in our time has become one of the most important environmental problems.

**Analysis of recent researches and publications**

The issues of land degradation and ways of its reduction are considered in the works of domestic

scientists, such as Medvedev V. V., Laktionova T. M., Miller L. G., Vaskevich VG.

It must be emphasized that so far the soil has not been a subject to corresponding protection policy at the EU level. But awareness of the importance of this natural resource, its value in improving long-term competitiveness of Europe, including food security, become a prerequisite for submitting this question in the agenda.

At the national level and at EU level — some aspects were scattered in the legal agreements for the protection of the environment from waste chemicals; the prevention of industrial pollution; control, climate change, water framework directive, the development of agriculture and rural areas. They include some provisions on soil protection, but they are neither intended nor effective for the protection of soils against all degradation processes. Therefore, the introduction of mutual responsibility, especially in respect of agricultural land, with the inclusion of comprehensive soil conservation in a changed common agricultural policy and the programme of rural development of the EU is becoming crucial. Therefore, the problem of rational use of soils and their protection in the EU remains topical and requires new integrated approaches for their solution.

By order of the Cabinet of Ministers of Ukraine dated 22.10.2014, № 1024-R approved the Concept of combating land degradation and desertification [1]. The purpose of the Concept is to increase the effectiveness of government policies to combat land degradation and desertification, identifying priorities, strengthening

institutional capacity and improving coordination of the competent authorities in the relevant field, as well as ensuring compliance by Ukraine, as a party Convents UN combat desertification in those countries which suffer from serious drought and/or desertification, particularly in Africa, of international obligations.

The purpose of this article is a development of methodical recommendations on improving the coordination and effectiveness of an integrated approach to land management at the national level at the stage of formation of the regional programs in terms of decentralization of power.

### The main material

Consequently, land degradation and desertification are among the most serious challenges for the sustainable development of our country, which cause significant environmental and socio-economic problems [2].

The most ambitious degradation processes are water and wind erosion of soil (about 57 % of the country), and land inundation (about 12 %), acidification (almost 18 %), salinization and alkalization of soil (more than 6 %).

According to different criteria, about 20 % of Ukrainian lands are contaminated. Every year almost 23 thousand cases of landslides are fixed. As a result of abrasion nearly 60% of the coast of the Azov and Black seas and 41% of the shoreline of the Dnieper reservoirs are collapsed. More than 150 thousand hectares of land are destroyed by mining and other activities. The number of groundwater and surface karst erosion is about 27 thousand.

As a result of land degradation during 1986 -2015 years, the humus content has decreased on 0,22 % and now it is 3,14 %. During this period, losses of humus in arable layer amounted to 5500 kilograms per hectare. Annually with the harvest of crops per hectare irrevocably alienated 77 -135 pounds of nutrients (nitrogen, phosphorus, potassium).

The main reasons for the decline of agronomic properties of the soil are water and wind erosion, re-cultivation of heavy and powerful tractors and harvesters. In Ukraine there are 57,5 % of the soil suffering from erosion. This process increases dramatically due to the low culture of farming, outdated methods of soil treatment, etc.

Under the influence of human activities, the soil is destroyed 100-1000 times faster than in natural conditions.

Water and wind erosion is a very serious factor in reducing land productivity and degradation of agricultural lands. Every year due to erosion the amount of eroded land in Ukraine increased by 80-90 thousand ha. It lost approximately 11 million tons of humus. Most

of eroded agricultural land is in Donetsk (70.6 per cent), Lugansk (61,6 %) and Odessa (55.8 %) areas.

Zaporozhye, Lugansk, Kherson regions suffer from wind erosion and dust storms.

Prolonged unsustainable exploitation of land resources, the lack of an adequate colonizing land use and modern, not ecologically balanced agriculture have threatened soil of Ukraine. A huge proportion of land under intensive treatment with a high percentage of tilled crops, consolidation of farms and fields led to the development of the unprecedented and progressive erosion of the richest Chernozem soils.

About a third of the arable land of the country falls under the threat of water and wind erosion. Poor land management, particularly cultivation of crops on steep slopes, excessive forest cutting, shrubs and bushes and overgrazing accelerates erosion process.

Serious problem is posed by water erosion, including agricultural lands located on slopes.

Deflating dangerous ground owned 33.4% of the total area of agricultural lands, including those subject to water erosion of 22.9 %, wind 2.9% and wind and water – 3,5 % [3].

In the lands of Kharkiv the process of erosion is rapidly developing. Erosion processes are detected in the form of sheet erosion and gullyng. Annually 10-15 t/ha of topsoil is removed from arable land in the region. 12.8 million Ha of eroded lands destroyed and need immediate reclamation by afforestation and grassing. The most fertile Ukrainian black soil (70 %) was destroyed, among which the part of completely destroyed soil increased over the past 15 years to 26 %, and the part of semi destroyed soil (this land, which, in fact, should be withdrawn from intensive land use) increased to 23 %.

Water erosion is spread in the region, primarily due to the runoff of melt water. Wind erosion occurs predominantly in the spring. Strengthening of the processes of degradation of soil cover is also due to anthropogenic pollution.

Problems of land degradation and desertification are exacerbated due to the rapid pace of climate change, which is accompanied by increase of average temperatures, the frequency and intensity of extreme weather events, including droughts, covering from 10 to 30 percent of the country every 2- 3 years, and 50 to 70 % of its total area every 10 – 12 years.

Land degradation and desertification leads to biodiversity loss, deterioration or disappearance of water bodies, increasing problems of water supply of the population and sectors of the economy and, as a consequence, the deterioration of living conditions of people.

The level of poverty in rural areas, which traditionally depends more on the state of use and protection of land and other natural resources in the last

10 years is 2-11 % higher than the average in the country, which leads to overexploitation of natural resources, their further depletion and degradation.

The problem is caused by:

- unreasonably high level of economic (especially agricultural) development of the area and the unbalanced ratio between land area;

- a violation of scientific principles of land use and agriculture, including the failure of crop rotations, reduction of the amount of any agrochemicals, above all fertilizers, including organic;

- irrational placement of industrial and residential objects, in particular violation of the principle of placing water-intensive industries based on local water resources;

- the insufficient area of land for environmental, recreational, health and historical-cultural purposes;

- unsatisfactory condition of providing land for the development of documentation in the field of land protection and enforcement of its activities, and the insufficient provisioning system of the State land cadaster;

- lack of the state system functioning of monitoring of lands and the environment, early warning systems and drought monitoring and hydro-meteorological observation network;

- inadequate logistical and personnel support of state authorities in the sphere of management of land and other natural resources;

- need for wider use of modern technologies, including GIS and remote sensing, as well as the latest scientific developments for the adoption and implementation of managerial decisions;

- insufficient volume of financial resources allocated for the solution of problems in the sphere of conservation and balanced use of land;

- departmental and sectorial orientation and lack of coordination events in the field of combating land degradation and desertification without taking into account the multifactorial causes and consequences;

- lack of awareness, interest and ability of land owners and land users, whose number has exceeded to 25 million individuals who use the land and cause the problems of degradation.

The main solutions to the problem at the national level and at the stage of formation of the regional programs in terms of decentralization of power are:

- improving the structure of land and areas of economic activity with the aim of creating a balanced ratio between land and ecological safety and balance of the territory, in particular:

- increase of the area of agricultural land extensive use (hayfields, pastures), forests, forest shelter belts and other protective plantations in accordance with scientifically based indicators, taking into account regional peculiarities and natural-climate conditions;

- reduction of arable land due to erosion-dangerous, degraded, unproductive and technologically contaminated agricultural land, floodplains and coastal protective strips of water objects;

- creation of new areas and increase of the area of the existing territories and objects of natural reserve fund;

- creation of conditions to ensure the formation of the ecological network;

- provision of wide introduction of environmentally sustainable land use technologies, including those aimed at the development of special raw material zones and organic agricultural production;

- improvement of economic mechanisms to encourage landowners and land users to implement environmentally friendly activities, conservation of soils and renewal of their fertility;

- improvement of the state system of environmental monitoring, including land (including large-scale soil survey and agro chemists), forests and waters, the improvement of the functioning of the state land, forest and water inventories, the development of relevant documentation in the field of land protection and land utilization, enforcement of its activities, and forest management;

- ensure the proper functioning and improvement of the system of early warning and monitoring of droughts and hydro-meteorological observation network;

- the introduction of an integrated approach to the management of land and other natural resources, improvement of its coordination and efficiency.

The problem can be solved by performing the tasks in the following areas of activity:

- improvement of policies in the field of protection and sustainable use of land and other natural resources, preservation of soils and renewal of their fertility, including regulatory support;

- development and implementation of scientific and technological knowledge, implementation of evidence-based interventions;

- carrying out advocacy, awareness-raising and education;

- strengthening the institutional capacity of the competent authorities;

- creation of conditions for mobilization of financial resources.

A washout of pollutants into rivers, lakes and ponds becomes a side effect of the erosion. The most negative impact in this regard is observed in the Dnipropetrovsk, Donetsk, Kirovohrad, Luhansk, Odessa and Kharkiv regions.

In reservoirs, ponds and small rivers the pollution levels are much higher than in high flow watercourses; especially the pollution level of nutrients, which significantly speed up the processes of "flowering" of

water. Due to the "flowering", water quality is deteriorating, making the use of water bodies for drinking water and water recreation more difficult.

"Flowering" significantly affects the physico-chemical and biological characteristics of water. While "flowering", the water becomes turbid, the transparency significantly decreases. The water acquires an unpleasant odors and flavors.

In the period of active reproduction of blue-green algae musty, moldy, putrid smells and sulfur-hydrogen appear. During the mass development of algae other general sanitary characteristics of water change too.

During the "flowering" blue-green algae causes deterioration of the oxygen balance of the water body. As a result of blue-green algae activities the conditions for development of pathogenic microflora are increasing. High concentration in water of blue-green algae is causing summer fish kills, creates conditions for the accumulation of a considerable quantity of various pollutants, many of which are dangerous to warm-blooded animals and humans (toxins, carcinogenic compounds, etc.). During the "flowering" there is a lot of algae (blue-green, diatoms, etc.) in water bodies that, interacting with other substances, such as iron, changing the color of the water. There a specific odor after the death of the algae in the water. The appearance of "flowering" is not accidental. It is a natural phenomenon that occurs as a result of human intervention in the formation of the natural processes in water bodies [1,4 – 7].

One of the areas of reduction of pollutants discharged into water bodies is a system of organized activities conducted by the environmental agencies within the watersheds: implementation of the system of regulation of wastes, organization of environmental monitoring in the waste management system, inventory of facilities and waste disposal sites, development of schemes of sanitary cleaning of cities and settlements, aimed at reduction of receipts in the environment of pollutants released from waste in natural resources management [8].

Not less important are environmental initiatives and the work carried out within the watersheds on the organization of the catchment surface, the re-establishment of sustainable grass cover and woody shrub vegetation, reducing erosion and polluting processes. Carrying out the works on the organization of the catchment surface, and correct landscaping will help to remove a large part of surface runoff into the underground with the purpose of cleaning it, using rocks of aeration zone and coastal floodplain areas as geochemical barriers [9 – 10].

So contaminated soil is a threat to human health both directly; or as the source of the infection products that are grown on it and as the source of the contamination of ground and surface waters.

The disastrous state of our lands requires urgent evidence-based interventions aimed at improving soil fertility, production of ecologically clean food and safe water environment.

## Insights

The most important measure for soil conservation is the proper shaping of cultural landscapes. In each ecosystem should have its own, science-based relationship between field, forest, meadows, marshes and ponds. This will give the highest economic effect and preserves the environment. No less important is the organization and adherence to field, forage and other crop rotations. To conserve soil we should change to the advanced forms of cultivation, efficient and lightweight machines and mechanisms, reduce repeated tillage and try the plowless cultivation. We should introduce the ultra-chemical method of managing organic (biological) farming without the use of pesticides and substandard fertilizers.

In this study, the author suggested an approach to the integrated approach to the management of land and other natural resources, the regional program for improving the conditions.

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## УЛУЧШЕНИЕ КООРДИНАЦИИ И ЭФФЕКТИВНОСТИ ИНТЕГРИРОВАННОГО ПОДХОДА К УПРАВЛЕНИЮ ЗЕМЕЛЬНЫМИ И ДРУГИМИ ПРИРОДНЫМИ РЕСУРСАМИ

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*Уменьшение антропогенного воздействия и загрязняющих веществ требует внедрения новых, более эффективных методов охраны, борьбы с вредителями, рационального использования, сохранения и повышения плодородия. Разработка нового интегрированного подхода к управлению предложенная автором в рамках исследования дает возможность внедрения новейших методов в управление почвенным покровом и другими природными ресурсами, опираясь на европейский опыт.*

**Ключевые слова:** почвенный покров, управление проектами и программами, управление природными ресурсами, деградация, эрозия

## ПІДВИЩЕННЯ КООРДИНОВАНОСТІ ТА ЕФЕКТИВНОСТІ ІНТЕГРОВАНОГО ПІДХОДУ ДО УПРАВЛІННЯ ЗЕМЕЛЬНИМИ ТА ІНШИМИ ПРИРОДНИМИ РЕСУРСАМИ

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*Розробка нових, більш ефективних методів догляду за збереженням ґрунтового покриву, боротьби зі шкідниками, раціонального використання, збереження та підвищення його родючості, зменшення антропогенного впливу на ґрунти та зменшення в ньому пестицидів, агрохімікатів, сульфатів, важких металів вимагає розробки нового інтегрованого підходу до управління ними. В рамках дослідження авторами запропоновано новітні методи управління та іншими природними ресурсами, регіональну програму з поліпшення стану природних ресурсів.*

**Ключові слова:** ґрунтовий покрив, управління проектами та програмами, управління природними ресурсами, деградация, эрозия.