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ECOLOGICAL AND ECONOMIC ANALYSIS OF ADAPTIVE LANDSCAPE SYSTEMS UNDER CONDITIONS OF SUSTAINABLE DEVELOPMENT

Abstract. The article considers the adaptive-landscape system, which consists of the natural, cultural and historical characteristics of a particular area. The article describes the main characteristics of the territory, landscape elements; the importance and negative or positive expression of each characteristic is determined; The assessment of the spatial conditions of the landscape is given. These indicators formed the basis of the environmental and economic analysis of the territory. A new systematic approach to the landscape, measures to revitalize spring areas, and measures to combat erosion: organizational, agricultural, technical measures are proposed.

Key words: landscape, landscape features, adaptive-landscape system, ecological and economic analysis of territories, systematic approach.

Introduction. The landscape character is made up of natural, cultural and historical characteristics of a particular place or area. The landscape character is influenced by human activity. The state, experts, legal and natural persons participate in the creation of the character.

According to Löw and Míchal, it is important to remember that the landscape is the environment in which one lives and one is the one who has been in control of the landscape for a long time. The image and quality of the landscape is therefore a direct reflection of the quality of human society (LÖW, 2003).

Methods. In the research process general methods of scientific knowledge were used namely empirical research methods (observation comparison measurement experiment) and theoretical research methods (abstraction analysis and synthesis idealization induction and deduction mental modeling ascent from abstract to concrete).

The empirical level of knowledge includes: observation of phenomena the accumulation and selection of facts and the establishment of relationships between them.

The theoretical level was associated with the predominance of mental activity with the comprehension of empirical materials its processing. At the theoretical level we have revealed the internal structure and regularity of the development of the territorial system and phenomena their interaction and conditionality.

Results. The landscape character is determined by the following indicators:

- defining the main characteristics of the territory
- differentiation of the territory into characteristic territorial units
- creating an inventory of essential landscape features: landscape components and features;
- determining the importance and negative or positive expression of each characteristic;
- evaluation of spatial conditions of landscape characterization characteristics;

• design of landscape protection (Bukáček 1999).

Landscaping is the most effective tool for landscape protection and restoration in the landscape planning system (Váchal 2011).

Man has transformed the natural landscape into a cultural landscape with different ecosystems that affect man to varying degrees. There is an imbalance in nature and its correction is very demanding.

Negative impact of agricultural activity with incorrect sowing excessive chemicalization land consolidation by plowing of boundaries drawers etc. brings with it a loss of stabilizing landscape features and landscape drainage that reduced the amount and quality of animal facilities disrupted runoff conditions in the landscape polluted water and degraded land. The growth of industrial production is causing global warming depletion and depletion of the ozone layer acid rain water and soil contamination caused inter alia by the huge increase in waste and hazardous substances contained therein. The negative impact of urbanization brings changes due to the increasing demands on the infrastructure production spatial settlement like.

In terms of human activity impact on the aquatic environment and in relation to the level of responses of biotic systems Helešic Adámek and Rulík identified these basic activities of human society with an impact on the aquatic environment and their impacts which are listed in table.

Landscaping measures landscape features. Landscaping measures are a never-ending process. The aim in the landscape is to break up large soil formations which are undesirable into smaller mosaic formations. The landscape elements are natural or man- made as bio-belts planting solitaires grassy herbaceous plants afforestation of agricultural land water bodies - pools pools shrubs alley boundaries etc.

Some activities of human society and their impact on water recipients

Climate change	Rise of UV radiation
Human population growth	Emissions from transport
Urban sprawl and waste	Acid rain
Water consumption in agglomerations	Use of biocides
Chlorination of water	Liquid waste production
Water tanks and power plants	Drying of recipients
Minimum flow rates	Milling of acidic rocks
Introduction of new species	Export of water between river basins
High flow - flooding	Floating wood
Motor shipping	Recreational fishing
Water sports	Commercial fishing
Source: (Adamek 2014).	

These landscape elements are an integral part of the landscape divide it and form its character. Man-made landscape features require landscaping change of management and subsequent care usually repeatedly to ensure their permanent existence. The landscape features then provide a number of *erosion control* functions to protect soil from erosion by humiliating soil erosion agents *increasing water retention* in the landscape through measures such as dry polders throughputs *maintaining or enhancing ecological stability by* maintaining or enhancing biodiversity; *flood control; landscaping* (*landscape* design and landscape protection); *nature protection* - protected landscapes national parks important landscape features (Ministry).

On Nature and Landscape Protection describes the Protected Landscape Area (PLA) as a vast area with harmonious landscape characteristically developed relief significant share of natural ecosystems of forest and permanent grasslands with abundant representation of tree species eventually with preserved monuments of historical settlement. The aim in these areas is to improve the natural state preserve and create the best ecological functions and the economic exploitation of these areas which is carried out according to the graded protection zones which are four I - IV with zone I representing the highest degree of protection. Recreational use is only permitted provided that the natural value of these areas is not impaired (Ministry 2017).

The protected landscape area its tasks and specific protective conditions are declared by the Government of the Republic by decree. The proclamation of the Protected Landscape Area means observing many conditions. The most important of these are the ban on the disposal of waste outside sites designated with the consent of the nature conservation authority throughout the PLA permit or carry out deliberate distribution of geographically non-native plant and animal species build new highways settlements and canals. In the area of zone I of the Protected Landscape Area it is also forbidden to fertilize land use slurry of silage juice and other liquid waste. On the territory of I. and II. The second zone of the PLA is also forbidden to manage land outside the built-up areas of the municipality with such tools and actions leading to a substantial change in biodiversity structure and function of ecosystems or which may irreversibly damage the soil surface. Furthermore the use of biocides change of water regime etc. (Ministry 2017) are forbidden.

The Law on Nature and Landscape Protection defines National Nature Reserve (NNR) as the minority areas of exceptional natural value for natural relief with a typical geological structure is linked ecosystems important and unique in a national or international scale. A nature reserve (PR) is similar in definition to the NRP but only with a significance not exceeding a regional scale (Czech Republic 1992).

Targeted landscape management affects ecosystems. Effective landscape management implies knowledge of the region good management expertise interconnection and close cooperation of all areas and authorities concerned control and transfer of information as well as considerable financial resources.

According to Maršálek it is necessary to understand the actual reservoir and the basin above the reservoir as one planning unit because the modern project of reservoir renewal must never neglect the processes in the basin above the reservoir. It is necessary to see the reservoir and the river basin above it in all hydrological hydro chemical and hydrobiological contexts for a sustainable ecological condition of reservoirs and river basins. Modern tank renewal projects are being carried out with the aim of establishing processes and measures aimed at restoring the ecosystem to the desired state and rebalancing the aquatic ecosystem thus initiating unified and sustainable management of the reservoirs and their catchment areas. From the point of view of processes it is necessary that the balance of both processes (eg oxygen regime) and structure (eg limitation of the predominance of a certain group - macrophyte growth rapid growth of cyanobacteria etc.). The fulfillment of the stated objective of implementation of such projects for the renewal of reservoirs is conditioned by the available data which will allow an insight into the functioning of the entire reservoir system and the river basin above it. Experience shows that the source of failure or failure to achieve the expected result is often the poor quality limnological data on which the project was based. It is crucial that the system of implemented measures is based on real factors that determine water quality not only data from the growing season. Specific processes and measures can be prepared on the basis of high-quality input data (eg in case of projects limiting the development of cyanobacteria then scenarios of movement and fate of nutrients in a specific river basin and a specific reservoir). Projects of restoration of ecosystem watercourses are implemented with a number of different objectives (restoration of biodiversity reduction of nutrient input from catchment areas reduction of cyanobacteria development etc.) (Adámek 2014).

Other experts also agree with this view. Syrovatka says that the management of water reservoirs must also take into account the management of the entire catchment area (Syrovatka). According to Duras an important and essential part of the management of water reservoirs is the integrated reservoir management or basin reservoir with the collection of sufficient information and evidence to evaluate and the choice of the next optimal procedure. It is necessary to take a few steps as expand and improve monitoring of water reservoirs and their watersheds so that the data allow insight into the functioning of the whole system dramatically increase the level of assessment of water quality in reservoirs inclusion of mass balances in assessing the basin reservoirs to pursue the course pohuby nutrient eventually erosion of the material to be able to build different models of the effects of the measures proposed in favor of water quality identify opportunities for good ecological potential of reservoirs by supporting the development of stable Litoral with aquatic plants develop flood control in watersheds with the intention to meet the objectives of the areas basin. All of the above results are reflected in river basin district plans (Duras 2006).

According to Maršálek effective reduction of nutrient water pollution in the monitored basin means to carry out exploration of resources mainly phosphorus suspended solids suspended solids sediments and other organic substances both in standard conditions and in extreme dry or torrential flows. rain or long-

term rainfall. The survey will show where and under what circumstances the prevailing source of phosphorus is farming in the landscape (area sources) where and under what conditions they are the main source (point sources - municipalities and municipal waste water) further determine the importance of recreation fishing etc. on the basis of the assessment the majority of percentages of pollution sources are determined which are the basis for the selection of priorities in the reduction of phosphorus concentrations in river basins and reservoirs (Adámek 2014).

According to Maršálek municipal and industrial waters and run-offs intensive agricultural production and aquaculture are the main sources of nutrients in surface waters in the Czech Republic. Improving the quality of water in a reservoir with sustainability presupposes solving the problem of transporting nutrients to river basins. The recovery plan is the determination of the number of point nutrient sources under which concentrated wastewater discharges from settlements industrial plants etc. and diffuse nutrient sources such as landfills agricultural areas etc. and the detection of nutrient water retention of water bodies can be imagined. Legislation to reduce phosphate detergents and intensify nitrogen and phosphorus removal in wastewater treatment plants is also an important area for reducing nutrient input from point sources. The building of artificial wetlands can also have a significant function to capture nutrients. Natural elements such as arable land grazing wetlands vegetation buffer strips surfaces allowing the infiltration of low-polluted water into the soil instead of its drainage into sewers and watercourses are used for the remediation of diffuse pollution. Dozens of measures to reduce water and nutrient runoff from the landscape and the principles of good economic practice are the basis for changes in management. The basic motto is: if we retain water in the landscape we will also retain nutrients in the landscape which in turn do not increase tank trophies and thus prevent eutrophication processes (Adámek 2014).

According to Maršálek water ecosystems are an open system in terms of energy and matter. The size of the reservoir and the basin affects the number of stocks and the community system. Tanks are part of a river basin each river basin and tank being an original unit with interconnected subsystems. The recovery technique must not be solved locally or once. Measures aimed at improving a single parameter without linking to ecosystem contexts may exacerbate other indicators that may undermine the equilibrium of the aquatic ecosystem. One of the fundamental theories of phytoplankton ecology is Reynolds' theory which speaks of naturally assembling or collecting phytoplankton under specific conditions that is under certain hydrochemical hydrological and hydrobiological conditions. The species composition of phytoplankton has its laws from which we understand that only nutrients are not the only condition for mass development of cyanobacteria. A number of existing techniques for limiting cyanobacterial development must be applied based on knowledge of the limnological and ecotoxicological context but also the socio-economic context land use in the basin above the reservoir long-term activities to reduce land transport sedimentation rate etc. where the trophic burden on river basins and reservoirs will be programmatically reduced where the amount of infectious inoculum of the predominant species of water blooms will decrease and where factors contributing to the enormous growth of cyanobacteria will be monitored for a long time. Removing only one factor will not limit the enormous proliferation of cyanobacteria (Adámek 2014).

According to Marshal the production of water flower is influenced by a number of indicators such as phosphorus temperature temperature stratification solar radiation CO2 pH and nitrogen. Knowledge of these factors is followed by methods of limiting the expansion of water flowers. The basic measures include control and reduction of the input of nutrients into the reservoir especially phosphorus and control of the source areas both internal (release from sediments) and external (source in the basin above the reservoir). It is clear from practice from abroad that the cheapest and most effective method is the long-term and systematic reduction and prevention of feeding nutrients into the tank. Such a measure could be the use of phosphate-free detergents (Adámek 2014).

Current problems of water reservoir management. Nowadays many reservoirs face considerable problems such as water quality and quantity eutrophication or erosion. As mentioned in the introduction the Plumlov Reservoir where adjacent gardens began to slide down due to erosion has a big problem today (Havlík 2013). Eutrophication plagues eg. Water reservoir Švihov River Želivka. The Great Depression took place in 2015 at the Orlík Dam where the drought level decreased to a critical minimum (Novotná 2015). This tremendous problem does not only concern the dams but also the rivers themselves.

Man has influenced the landscape and thus the runoff conditions from past times as a result of deforestation grazing of grass ecosystems cultivated arable land artificial canals water drainage from rivers to artificial irrigation to drive mills.

According to Syrovátka significant drainage of spring areas and springs of individual streams where the stream has been handicapped from the outset due to lack of water brings with it the problem with the quantity of water in the catchments (Syrovátka).

The individual components of the outflow are influenced by the volume of water flowing from the catchment depending on the influence of atmospheric precipitation and other climatic factors and their intensity - solar radiation air temperature and humidity evaporation. However the influencing factors influence soil geological conditions vegetation cover land treatment on large acreages in agriculture and forestry. Geological bedrock and its permeability affect runoff during rainless periods. The density of the watercourses the geometric features of the river basin (shape length of the valley) and the catchment conditions determine the rate of runoff and its accumulation in a particular flow profile. Soil conditions in relation to the infiltration are influenced by soil properties (soil type mother rocks geological bedrock) soil structure status its penetration asphyxiation (Cerhánová).

In the past ameliorations were carried out where they were drained mainly in spring areas ie in higher altitudes where the springs are mostly found but also in places where there was a larger amount of standing water as in floodplains etc. (Šir 2006). Experience has shown that these inappropriate amelioration interventions have a negative impact in terms of water scarcity.

There is a paradox where water is scarce but at the same time the spring areas are drained. This is a major problem that is compounded in cases of erosion threat (Syrovatka).

The revitalization of watercourses introduces and implements processes aimed at restoring the original natural functions of aquatic ecosystems. The conditions for improving the water regime in the landscape are realized through the system of ecological stability of the landscape land consolidation water management functions of the forest motivation of landowners and forests and legislative pressure. Revitalization is carried out by watercourse administrators; this obligation is legal. Revitalization must be meaningful and planned aiming at restoring the natural character and natural functions of watercourses and floodplains (Just 2005).

According to Helešice the objective in terms of water is to maintain and improve the retention capacity of the landscape. The intention of the river system revitalization program is to modify or eliminate amelioration interventions to remove artificial drainage of pipes channels etc. to adapt them to the form of ecosystems close to nature. Watercourses not only drain water but also have an additional function as a natural migration pathway for organisms; furthermore it is desirable that they have a natural self-cleaning ability which requires increasing water oxygenation restoring introducing and maintaining shore consolidation through vegetation. Impaired aquatic ecosystems can be influenced by appropriate adjustment of the flow ratio by adjusting the longitudinal and transverse profile of the stream (including bottom and shore bases) removing sources of pollution and eutrophication of streams. Adjustments must be assessed comprehensively (Adámek 2014).

Helešic notes that according to Government Resolution No. 373/92 a program for revitalization of river systems was established with the following content:

– Support of landscape retention capacity - slowing down of surface and subsurface water runoff from the landscape by retaining water in water reservoirs and wetlands and increasing soil coverage

– Remediation of improperly performed amelioration interventions - in the framework of revitalization programs previously unsuitably dried wetlands or deforested steep slopes should be adapted again to the form of naturally close systems

– Restoration of natural function of watercourses - to restore their function as natural migration routes of organisms in watercourses restoration of bank vegetation as a reinforcing link removal of unsuitable modifications of rivers and small streams in the form of pipes concrete troughs etc. (Adámek 2014).

Helešic notes that from a professional point of view it is possible to correct altered flow conditions adjust the transverse and longitudinal profile of the flow and at the same time modify the substrates of the bottom and banks remove sources of pollution and eutrophication of the flow (Adámek 2014).

Soil is a dynamic natural formation formed of mineral and organic material and living organisms in which plants grow. Soil originates and develops with the participation of organisms and biological processes for a very long time by weathering rocks and minerals by physical and chemical processes (Šimek 2003).

Erosion is one of the most important factors influencing the landscape leading to its change. It is a process of soil erosion especially in our climatic conditions mainly by water and wind in the world for example by the activities of glaciers. Exposure to soil erosion is due to the intensive use of land for agriculture the preference for growing certain crops and large-scale deforestation which has gradually eroded the natural soil cover. Erosion has developed through the destructive effect of water and wind on the soil surface.

Soil erosion is a process of separating transporting and storing material by erosive mostly abiotic agents. Erosion is like a long-term agent that models the planet's surface in all geological times (Kvítek 2006). Soil erosion is one of the greatest environmental and economic problems.

Soil erosion has the following negative impacts (Medunová 2013):

- causes the depletion of agricultural land by the most fertile part - topsoil
- deteriorates the physico-chemical properties of the soil
- reduces the thickness of the soil profile
- reduces nutrient and humus content
- harms crops and cultures
- Increases graveliness
- makes it difficult to move machinery on land
- causes loss of seeds and seedlings fertilizers and plant protection products

The process of soil erosion is a natural process it cannot be completely stopped. In a non-standard condition however accelerated erosion occurs which disrupts the soil surface to such an extent that the soil particles cannot be replaced by the soil-forming process. Accelerated erosion is influenced by human activity and farming.

Water erosion is a complex process that causes the erosion of the soil surface (top soil the most fertile soil - topsoil) the transfer and storage of loose soil particles under the influence of water during heavy rainfall or rapid snow melting the top layer of soil. Water erosion worsens the physicochemical properties of soils reduces soil profile thickness increases gravel reduces nutrient and humus content reduces soil permeability damages crops makes machinery more difficult on land and causes loss of seeds seedlings fertilizers and plant protection products and therefore it also reduces hectare yields (Novotný).

The causes of water erosion are specific in the Czech Republic. Due to the intensification of agriculture huge soil blocks were created in the past hydrographic and landscape elements were disturbed (plowing of boundaries grassy valleys dirt roads liquidation of scattered greenery etc.). At the same time however as a result of the discontinuation of agricultural land trading in the 1960s land ownership per person was the least. A large number of agricultural holdings managed on leased land which reduces the interest in investing in soil conservation measures. In the past watercourses troughs weirs weirs and irrigation canals were modified. The streams were straightened deepened and fortified which shortened the streams by almost a third of their length. This caused an acceleration of the outflow of water from the landscape and consequently a decrease in groundwater reserves and degradation of floodplains. Stream straightening causes undue stability of the bed and riverbanks which led to the need to strengthen them. Strengthening brings with it the removal of vegetation on the shore and smaller water bodies around the streams. Industrialization and development of settlements brought with it the use of energy and transport flows (Novotný).

The impact of erosion is the fouling and pollution of watercourses and reservoirs causing excessive intake of nutrients from fertilizers and other chemicals into the aquatic environment where they often cause an increase in algae production (eutrophication) the formation of a water bloom and the multiplication of one or other animals. This situation can also significantly complicate the process of treatment of surface water to drinking water there are higher costs of water treatment and sediment extraction (Novotný).

Reducing erosion will increase the protection of water resources and help maintain or improve the favorable structure and composition of agricultural soils. If the agricultural landscape fails to hold water then the risk of drought and floods increases.

The main consequences of water erosion are:

- a threat to the sustainability of soil fertility;

– influencing the quantitative parameters of water sources (watercourse channel capacity and available reservoir volume);

– influencing the qualitative characteristics of water resources;

– endangerment of urban areas of municipalities roads and other infrastructure in the landscape by surface runoff and water erosion processes (Novotný).

Water erosion is influenced by the slope of the land in relation to its length along the slope vegetation on it soil properties and its disposition to erosion established erosion control measures frequency of occurrence of torrential rainfall after a drought lack of organic matter in the soil. From the point of view of soil protection the positive influence of organic matter on the stability of the soil structure is important because by means of organic substances the individual soil particles are cemented into clusters which create pores between them. Soil porosity affects the infiltration of water into the soil reduces surface runoff and better resists the load when traveling through heavy mechanization on land. If organic matter is not delivered to the soil in the long term its properties deteriorate. Restoring soil quality in terms of sufficient organic matter content is much more demanding in terms of time organization and economy than early prevention of the reduction of organic matter in the soil (Novotný).

Wind erosion is influenced by meteorological and soil conditions (grain size structure) soil moisture soil surface roughness vegetation cover of soil method and period of cultivation of soil and length of land; wind speed and direction duration and frequency; amount and form of atmospheric precipitation and evaporation; soil cover and condition of the soil and weather during the implementation of agrotechnical operations. Wind erosion causes soil disruption due to wind causing soil particle movement sometimes over long distances (Novotný). Plowing erosion is the process of causing soil to move in the direction of a slope. Plowing erosion with its average annual values approaches water erosion. Snow erosion can cause in particular sliding of soil layers when the upper waterlogged soils pass through the lower layer which is still frozen during slow melting. During the erosion of the harvest the soil is lost from the land together with the harvested crop. Then the extent of soil loss is influenced by the method of harvesting soil moisture and its properties (CENIA).

The measures aim to mitigate the negative impact of erosion. The application of anti-erosion measures consists of protecting the soil from the effects of falling drops of erosion-hazardous rain promoting water infiltration into the soil reducing water transport energy and concentrated surface runoff slowing down catching and safely draining surface runoff. The concentrated surface drain is safely drained to the watercourse or to a place where it does not cause damage and catches the washed soil.

Erosion control measures are divided into:

– organizational;

– agrotechnical;

– technical.

Measures that are financially and easier to implement are measures of an organizational and agrotechnical nature and measures of a technical nature are more expensive.

Organizational measures deal with the optimum shape and size of the land land block or its part the appropriate location of the crops including the protective grassing and the belt cultivation of crops. The principle is to locate the land block or soil part with the long side in the contour line which encourages cultivation along the contour line the appropriate size and shape of the land and the delimitation of parcels suitable for changing land types (Váchal 2011). In reality this type of measure is most often introduced in connection with the implementation of complex land consolidation.

Agrotechnical measures concern soil-protective cultivation. *Includes contour sowing / planting protective tillage (stubble mulch / shallow sowing / planting protective crop sowing sowing with under-crop drowning punching; hoeing chiseling undermining; sowing maize in a narrow row; belt tillage* (Novotny). Other measures include protecting grassing protective afforestation (optimally mixed forest). crop insufficiently protecting soil from erosion only to land flat or slightly sloped with a permeable structure belt rotation plowing along contour lines and the like. (Vachal 2011).

In case of necessity to build technical measures field roads with erosion control function ditches hatchways protective dikes and reservoirs terrain settlements grassy valleys with stabilized path of concentrated runoff terraces erosion limits redevelopment of erosion potholes and gorges (Novotný).

Implementation of technical measures comes after the introduction of organizational and agrotechnical measures as a complement. The main purpose of technical anti-erosion measures is to interrupt the length of the land along the slope and drain the surface runoff (ditches ditches ditches) catching washed soil and surface runoff delaying it and safe harmless drainage (dams sedimentation retention and dry tanks) (field settlements terraces historical limits). Technical measures are investment measures subject to the Building Act (Novotný).

On the ground *heavily threatened by erosion* they are not suitable for growing crops erosion dangerous as corn potatoes beets pea beans soya sunflower and sorghum; Other cereal crops and oilseed rape should be planted using soil protection technologies or in the case of other cereals the condition of soil protection technologies need not be complied with only if they are cultivated with clovers or leguminous mixtures. On *slightly erosion-endangered soils* erosion- hazardous crops such as maize potatoes beets broad beans soybeans sunflowers and sorghum should only be set up using soil protection technologies (Novotný).

Specific soil-protection technologies on moderately erosion-threatened areas for planting broad-crop crops include break-straps infiltration belts headland sowing sowing / planting de-stoning sugar beet bedding growing of leguminous mixtures. General or specific soil-protection technologies when establishing stands of erosion-hazardous crops on a slightly erosion-threatened area need not be complied with provided that they are cultivated with a crop of non-erosion-sensitive crops sown at the latest together with the main crop (Novotný).

The issue of anti-erosion measures is dealt with in partby the standards of Good Agricultural and Environmental Condition of Soils (DZES or G AEC). Good agricultural and environmental condition (GAEC) standards are standards that ensure farming in accordance with environmental protection.

In particular the conditions of the DZES 5 standard stipulate in the framework of soil erosion protection the methods of growing selected main crops on strongly and slightly erosion-threatened areas registered in the public land register LPIS (Land Parcel Identification System).

For the new period of the Common Agricultural Policy 2015-2020 the basic direction of the standards of good agricultural and environmental condition of the soil is adjusted in accordance with Annex II of Regulation (EU) No 1306/2013 of the European Parliament and of the Council About protects land deal with three of them namely standard GAEC 4 (minimum soil cover) GAEC 5 (minimum land management in relation to specific local conditions to limit erosion) and GAEC 6 (preservation of soil organic matter levels appropriate procedures also burning of stubble on arable land).

The above standards include conditions that promote soil erosion protection through the introduction of soil protection measures to reduce soil shear slow down surface runoff increase water retention in the landscape and maintain or improve soil quality by incorporating fertilizers (Ministry).

The issue of combating water erosion is partly addressed by GAEC 1 a measure for the protection of sloping soils above 7 ° and GAEC 2 which discusses the principles of growing certain crops on heavily and moderately erosion-threatened soils. The measures under GAEC 1 and 2 therefore concern the plots which meet the specified criterion (GAEC 1) or are marked as severely or slightly vulnerable to erosion (GAEC 2).

Set criteria however solve the soil erosion control poorly and because they are set up slightly compared to the total area of farmland at risk. In addition GAEC standards are an economic tool to support the agricultural sector and do not replace the obligation for agricultural entrepreneurs to manage so as not to erode soil. Moreover they concern only those farmers who draw subsidies (Ministry).

Thus we carried out an ecological and economic analysis of the adaptive-landscape system which consists of natural natural and historical characteristics. The main characteristics of the territory landscape elements are disclosed; The expression of a negative or positive expression of each characteristic; The assessment of the spatial conditions of the landscape is given.

Discussion. The authors of the study suggest a new systematic approach to the object. The basis for supporting the functions that define the so-called containment-evaporation unit (RETU; see Eliash et al. 1999 and 2000). A new systems approach means understanding that the individual elements are RETUs. The goal is to restore water resources and restore water resources through transplantation of greenery which in turn stabilizes components in the water regime and prioritizes water recovery thermal conditions in the landscape (Syrovátka 2004).

The authors also point out the absurdity of the current way of defense against the ecological instability of the landscape which consists in the construction of new dams and other regulations of watercourses. The authors prove the ineffectiveness of this approach in comparison with the area-wide restoration of the retention-evapotranspiration function of the landscape also in connection with the assertion from the classical work of Kutílek (1978): when comparing the volume of water reserves in agricultural and forest land and the total volume of all water reservoirs that soil is a huge reservoir that should be given appropriate attention. Unfortunately the illogicality in this respect has not yet been understood by many experts. In an analysis of the impacts of climate warming a team of experts (Hladný et al 1995) came to an analogous conclusion: "*Soil is one of the fundamental input transformers of water resources both quantitatively and qualitatively. It is therefore important to manage water in the soil space and to use its retention capacity which requires in particular the following measures: reduction of surface runoff reduction of disproportionately large drainage by systematic drainage application of anti-erosion measures"* (Syrovátka 2004).

Within the project "Selected socio-scientific aspects of environmental management" the research team created the basis for the coordination of research activities in selected areas of the environment with a focus on the legal social psychological economic ethical and ecological fields. This created the conditions for an interdisciplinary approach to identifying and analyzing relationships that exist in a particular environment and affect quality of life. From a managerial point of view this conception is essential for problem-solving and decision-making both in the area of public administration and in the business environment and it is also a precondition for developing the company's knowledge (Hejda 2004).

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ТҰРАҚТЫ ДАМУ ШАРТТАРЫ БОЙЫНША АДАПТЕРЛІК ЖЕРЛЕРДІК ЖҮЙЕЛЕРДІҢ ЭКОЛОГИЯЛЫҚ-ЭКОНОМИКАЛЫҚ ТАЛДАУ

Аннотация. Мақалада белгілі бір аумақтың табиғи мәдени және тарихи ерекшеліктерінен тұратын бейімдеу-ландшафт жүйесі қарастырылады. Мақалада аумақтың негізгі сипаттамасы ландшафт элементтері; әрбір сипаттаманың маңыздылығы мен теріс немесе оң көрінісі анықталады; ландшафттың кеңістіктік жағдайына баға берілген. Бұл көрсеткіштер аумақтың эколоғиялық-экономикалық талдауының негізін құрады. Ландшафтқа жаңа жүйелік көзқарас көктемгі аудандарды жандандыру шаралары және эрозияға қарсы шаралар: ұйымдастырушылық ауылшаруашылық техникалық шаралар ұсынылады.

Жаңа жүйелік тәсіл жасыл желектерді отырғызу арқылы су ресурстарын қалпына келтіруге бағытталған бұл өз кезегінде су режиміндегі құрамдас бөліктерді тұрақтандырады және суды қалпына келтіруге басымдық береді сонымен қатар жаңа дамбалар мен басқа да құрылыстардан тұратын ландшафттың эколоғиялық тұрақсыздығынан қорғаудың қолданыстағы әдісінің қисындылығын көрсетеді. су ағындарының ережелері. Авторлар ландшафттың ұстап қалу-буландыру трансплантациялау функциясын кең көлемде қалпына келтірумен салыстырғанда бұл тәсілдің тиімсіздігін дәлелдейді: ауылшаруашылық және орман алқаптарындағы су қорының көлемін және барлық су қоймаларының жалпы көлемін салыстырған кезде топырақ - бұл үлкен резервуар оған тиісті назар аудару керек. Топырақ - сандық және сапалық жағынан су ресурстарын негізгі түрлендірғіштердің бірі. Сондықтан топырақ кеңістігіндегі суды басқару және оны сақтау қабілетін пайдалану өте маңызды ол келесі шараларды қажет етеді: жер үсті ағындарын азайту жүйелі дренаж арқылы пропорционалды емес үлкен дренажды азайту және эрозияны бақылау шараларын қолдану.

Зерттеу процесінде жұмыс тобы құқықтық әлеуметтік психолоғиялық экономикалық этикалық және эколоғиялық салаларға баса назар аудара отырып қоршаған ортаның нақты салаларында зерттеулерді үйлестіруге негіз жасады. Бұл белгілі бір ортада өмір сүретін және өмір сүру сапасына әсер ететін қатынастарды анықтауға және талдауға пәнаралық көзқарас үшін жағдай туғызды. Басқарушылық тұрғыдан алғанда бұл тұжырым мемлекеттік басқару саласында да бизнес ортада да мәселелерді шешу және шешім

қабылдау үшін маңызды сонымен қатар зерттеу саласындағы білімді дамытудың міндетті шарты болып табылады.

Түйін сөздер: ландшафт ландшафт ерекшеліктері адаптивті-ландшафт жүйесі аумақтарга экологиялық-экономикалық талдау жүйелік тәсіл.

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ЭКОЛОГО-ЭКОНОМИЧЕСКИЙ АНАЛИЗ АДАПТИВНО-ЛАНДШАФТНЫХ СИСТЕМ В УСЛОВИЯ УСТОЙЧИВОГО РАЗВИТИЯ

Аннотация. В статье рассматривается адаптивно-ландшафтная система которая состоит из природных культурных и исторических характеристик конкретной местности. Раскрыты основные характеристики территории элементы ландшафта; определена важность и негативное или позитивное выражение каждой характеристики; дана оценка пространственных условий ландшафта. Данные показатели легли в основу эколого-экономического анализ территории. Предложен новый системный подход к ландшафту мероприятия по оживлению весенних площадей и меры по борьбе с эрозией: организационные агротехнические технические.

Новый системный подход направлен на восстановление водных ресурсов путем пересадки зелени, что в свою очередь стабилизирует компоненты в водном режиме и отдает приоритет восстановлению воды а также указывают на абсурдность существующего способа защиты от экологической нестабильности ландшафта которая заключается в строительстве новых плотин и других нормативных положений водотоков. Авторы доказывают неэффективность этого подхода по сравнению с масштабным восстановлением удерживающей-эвапотранспирационной функции ландшафта: при сравнении объема запасов воды в сельскохозяйственные и лесные угодья и общий объем всех водохранилищ что почва является огромным водохранилищем, которому следует уделить соответствующее внимание. Почва является одним из основных входных преобразователей водных ресурсов как в количественном так и в качественном отношении. Поэтому важно управлять водой в почвенном пространстве и использовать ее удерживающую способность что требует в частности следующих мер: уменьшение поверхностного стока уменьшение непропорционально большого дренажа путем систематического дренажа применение мер против эрозии.

В процессе исследования рабочая группа создала основу для координации исследовательской деятельности в отдельных областях окружающей среды с акцентом на правовой социальной психологической экономической этической и экологической областях. Это создало условия для междисциплинарного подхода к выявлению и анализу отношений, которые существуют в конкретной среде и влияют на качество жизни. С управленческой точки зрения эта концепция важна для решения проблем и принятия решений как в области государственного управления так и в бизнес-среде а также является предварительным условием для развития знаний в области исследования.

Ключевые слова: ландшафт особенность ландшафта адаптивно-ландшафтная система эколого-экономический анализ территорий системный подход.

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