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ORIGINAL ARTICLE

Harnessing the resource potential of wetlands: the environmental context

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The main mistakes in understanding the importance of swamps for humankind are highlighted. In historical retrospect, different approaches to the development of wetlands were shown, the inexpediency of their total drainage in the former Soviet Union was revealed, as well as the erroneous popularity of this method in other countries, in particular, this applies to the "Vorpommern-Initiative Paludikultur" and "Gidrovia" projects. The hypothesis of an increase in oxygen in the air due to the disposal of organic carbon in wetlands is shown. The types of swamps that exist in Ukraine are given on the example of the Zhytomyr region. The main benefits that can be gained from the use of these elements of the landscape were noted. Determining the circumstances of occurrence in certain areas of each individual swamp was emphasized, ensuring its further optimal use. It was shown how the drainage of Iran's swamps led to anthropogenic desertification of lands. The importance of such a natural resource as peat for the economy of Ukraine was explained, the main areas of its application were shown, which include: medicine, cosmetology, energy, chemical, woodworking, paper industry, metallurgy, agriculture. Ukraine's participation in international agreements and conventions aimed at protecting wetlands was analyzed. Since Ukraine's independence, it has been proven that activities to preserve wetlands as a unique part of the hydrosphere have intensified significantly. The European Union's approaches to wetland conservation have been outlined, and it has been shown that this problem is taken into account in the formulation of the Community budget to encourage farmers to save the country's wetlands. Innovative methods of use and restoration of bogs were investigated; in particular, achievements of selection and agricultural technologies in this direction are meant. The importance of preserving wetlands because of the state of ecology in Ukraine was proved, and the need to study the best ways they used in EU countries for their further application in Ukraine.

Keywords: Swamp, Wetlands, Peatland, Environment, Ecology, Agriculture, International Agreements, Ukraine

Introduction

Such unique parts of the landscape, which are part of the hydrosphere as swamps today, are undeservedly ignored when considering the possible socio-economic development of Ukraine. This approach is partly due to the difficulties associated with the organization of work in wetlands and the difficulty of forecasting many types of business related to wetlands. Therefore, the potential of entrepreneurship, predominantly rural, is significantly limited, and as a result, the number of ways to form a competitive advantage in rural areas, where these swamps are usually located, is reduced. The area of wetlands is about 2% of the total area of Ukraine and is 0.94 million hectares. Most of the country's swamps are located in Volyn, Zhytomyr, Rivne, and Chernihiv regions.

Given that the swamps appeared long before the advent of man (the first swamps appeared between the Silurian and Devonian, i.e., more than 300 million years ago), research in this area has been conducted for a long time, and of this problem is devoted to many works of domestic and foreign scientists. Among them, the most interesting are studies related to the swamps of Ukraine. The first thorough scientific works were devoted to the study of vegetation and the stratification of swamps. Among the significant achievements is the discovery of Marchantiophytas (*Qxymitra pallacea* Bish. ex Lindenb, *Qxymitra pallacea, Riccia cilifera* Link. ex Lindenb and *Mannia fragrans*); their existence has not been noticed in Ukraine before (Zerov, 1938). The peculiarity of wetland vegetation is that scientists do not have a unanimous opinion about how many types there are: one or

more (Bradis & Andriyenko, 1974). The structure, chemical composition, and physical properties of peat soils are essential, as the dependence of these characteristics on the type of swamp – upland, transitional, or lowland was revealed. According to the method of origin, structure and chemical composition, types of swamps and peat soils correspond to the chemical composition of soil-forming and underlying rocks. There is an inseparable genetic link between peat soils and the rocks among which these peat soils were formed (Andrushchenko et al., 1965). It has been established that in Ukraine, swamps associated with modern or relict rivers predominate - valley, floodplain, terraced and in the old riverbeds, the most typical for our country are valley swamps, which are located in the valleys of small riverbeds (Bradis et al., 1973). Swamp soil formation is a part of a single soil-forming process, which coincides with the period when aquatic phytoautotrophic plants are mastered first the air environment and then the lithosphere shell of the land. The role of swamps and their soils in forming the modern biosphere is huge (Bakhnov, 2005). In addition to the great value of wetlands as natural formations, they are a source of such a valuable resource as peat, which due to the simplicity of extraction and many directions of uses has long been used in everyday life and production (Voloshchuk & Hahalyuk, 1999; Syvyy, 2012). Separately, peat's indispensability should be noted to restore the fertility of depleted soils (Veremeyenko & Strikha, 2017). Like other natural formations that make up the physical and geographical shell of the globe, wetland systems are an essential link in the chain of interconnected and interacting components of nature. In the hydrological aspect, swamps are indispensable for the flow of surface water and replenishment of groundwater reserves (Ivanov, 1975). The primary hydrological role of wetlands is the redistribution of runoff and the impact on various forms of water regime. Wetlands accumulate moisture, transfer surface runoff to underground runoff, reduce the height of the flood wave, increase the duration of the flood and help prevent catastrophic events (Frolova, 2010). Due to their coenotic and floristic uniqueness, most wetlands are natural monuments, so it is advisable to consider granting them the official status of protected areas (Chorney et al., 2008). It is essential to pay more attention to the issue of compliance with the legal status of wetlands due to their great importance for human life, environmental protection, and biodiversity conservation (Frolova, 2010; Kofonov et al., 2020; Vodianitskyi et al., 2020; Borshch et al., 2020; 2021; Butsiak et al., 2021; Prychepa et al., 2021; Hrynevych et al., 2021).

Modernity sets an accelerated pace of change in approaches to many aspects of life, today a new understanding of such an essential element of the landscape as the swamp. However, insufficient attention has been paid to studying the latest methods of conservation of unique wetland ecosystems and Ukraine's participation in international agreements on protection issues in the use of wetlands; this is partly due to constant changes in national and international legislation in this area. Therefore, the article aims to use the resource potential of wetlands under the condition of maximum preservation and restoration of their ecosystems and to study the state of national legislation in this area, its consistency with major global trends.

Materials and methods

A swamp in any area is often perceived as a negative factor due to several features: high humidity, poor or no patency. These places are often a source of harmful gases and fumes that cause damage to human and animal health and serve as a habitat for many blood-sucking insects (in some areas, the number of their species reaches 120) and vectors of dangerous diseases. It should be noted that there are no such dangerous swamps in Ukraine, although their area is quite large (Table 1). For a long time, this approach prevailed; the valuable features of the swamp are usually not taken into account, although among them are really important: the extraction of peat, medicinal and food plants, opportunities for hunting, and fishing. At the same time, history has preserved the memory of the great defensive significance of swamps, when the presence of this element of the landscape and the existence of people who knew the passages through the swamp to the islands of solid land, saved the lives of entire settlements during wars of conquest and raids. Such events are described, in particular, in the chronicles of the Second World War.

Table 1. Dynamics of changes in the area of swamps in Ukraine in 2009-2019 (Vlasenko, 2011; Prokopenko, 2020)

	2009		2019	
	thousand hectares	%	thousand hectares	%
Total area	60354.8	100.0	60254.9	100.0
open lands and wetlands	979.9	1.6	982.7	1.6

Although these lands are unsuitable for traditional agricultural activities, they bring tangible benefits. Some researchers argue that the forest, including tropical, is a balanced natural community, and therefore consumes the same amount of oxygen, which produces, in contrast to the swamps, where the burial processes of non-oxidized organic matter. It follows that if there was an intensive burial of organic carbon in a certain period of geological history, then intensively accumulated oxygen (Yes'kov, 2008).

Results and discussion

Most of Ukraine's swamps have received the status of nature protection objects. Only in the Zhytomyr region there are a very large number of them, in the form of separate territories or as part of other objects: natural landscape park “Polisky” (20104.0 ha); landscape park “Plotnytsya” (460.0 hectares); general zoological reserves “Kozyava” (1859.0 hectares); “Kutne” (922.0 hectares); ornithological reserve “Chasnikovsky” (612.0 hectares); hydrological reserves “Chervonovolsky” (805.0 hectares); “Zabarsky” (1095.0 hectares); “Didove Lake” (294.0 hectares); tract “Zamyry” (234.0 hectares); “Kalynka” (55.0 hectares); “Mikhailovichi” (139.0 hectares); “Pylypivka” (54.9 hectares); “Polihon” (2293.0 hectares); “Zdrivlya” (67.9 hectares); “Slovechanskyy kryazh” (18230.0 hectares); “Teresyny” (2189.7 ha); botanical reserves “Vetva” (352.0 hectares); “Veresy” (335.0

hectares); "Husti ostrovy" (1252.0 hectares); "Strausove pero" (29.2 hectares); general zoological reserves of the tract "Barvenkove" (41.9 ha); "Bobrove Boloto" (56.0 hectares); "Dovhyy Brid" (663.0 hectares); "Dovhyy mokh" (85.0 hectares); "Klenivsky" (296.0 hectares); "Tokiv mokh" (454.0 hectares); "Chernecha" (228.0 hectares); "Shchabel" (72.0 hectares); "Solovyove" (1445.0 hectares); "Borutynsky" (3116.0 hectares); hydrological reserves "Korch" (687.0 hectares); "Strakhiv" (2405.0 hectares); Buchmany (836.5 hectares); "Vovchi ostrovy" (452.0 hectares); "Volosne" (271.0 hectares); "Halove" (185.0 hectares); "Halove boloto" (92.5 hectares); "Zymnyk" (191.0 hectares); "Klunyshche" (36.0 hectares); "Komoryshche" (20.0 hectares); "Lozanove" (14.6 hectares); "Myslovychy" (52.0 hectares); "Perepsa" (117.0 hectares); "Rechytsya" (120.0 hectares); "Rykhty" (85.0 hectares); Sukachove (214.0 hectares); "Sushchanski stavky" (49.5 hectares); "Telyachyy mokh-1" (553.0 hectares); "Telyachyy mokh-2" (915.0 hectares); "Khvoshchove boloto" (11.6 hectares); "Chornyy mokh" (29.0 hectares); "Shchuche" (45.5 hectares); "Ivanivskyy" (57.1 hectares).

By type, these objects are divided into wetlands and complexes; wetlands with surface water intake; sphagnum bogs; moss-sphagnum bogs; riding bogs; swamps with open reservoirs; swamp areas; open reservoirs surrounded by swamps; mesotrophic swamps; eutotrophic bogs; swampy plains, floodplains, forest areas; open high-grass bogs; peat bogs; transitional, lowland and upper bogs.

The fauna of the swamps is rich and diverse; Zhytomyr swamps provide shelter for 39 species of animals, 176 – birds, 11 – amphibians, 7 – reptiles, among them beavers, muskrats, capercaillies, blackbirds, and otters.

Wetlands are rich in valuable berries. On average, it is believed that, on average, from one hectare of swamps you can without additional costs to collect two hundred kilograms of cranberries, blueberries, lingonberries. Here grow many valuable medicinal plants: heather, calamus, Ledum palustre, equisetum, Valeriana, Lemna, Menyanthes trifoliata, Polygonum bistoria, and Chamaenerius. Wetlands provided the rational use of their potential, are an inexhaustible source of organic medicines. Some of the plants are listed in the Red Book and are under strict state protection.

It is necessary to mention other plants of bogs, which are very many and almost all of them are used: as ornamental plants, including for landscaping; as fuel; animal feed, in the pulp and paper, in the construction, in the light industry; some also have nutritional value. Thus, there is every reason to believe that flora and fauna of swamps, provided rational use, have a chance to become an essential element of the local economy.

To plan the effective use of wetlands, it is necessary to clarify the individual characteristics of their occurrence. For example, if the swamp was formed due to recent deforestation, reclamation work will have to be carried out on these lands to conduct agricultural activities. If the swamp is ancient, to make the best decision, it is necessary to carry out a thorough study: the swampy soil indicates a waterproof layer. It can be successfully used for the arrangement of reservoirs. Crocodiles make such ponds; they dig with their paws and tail from the bottom to the shore dirt and debris, forming fairly deep and relatively clean ponds. In addition, it has long been known that under the water surface of swamps are often deposits of peat or clay, which is suitable for the manufacture of ceramic products. Unfortunately, the use of swamps in Ukraine is mainly limited to the extraction of peat and clay.

Swamp soil is the upper, as a rule, very low-power peat horizon to the depth of root distribution and the lowest level of groundwater. Layers of peat that lie deeper are transformed into rock. The profile of wetland soils is formed from dead plants; its intensity and depth depend on the species, determining the biochemical and mineralogical composition of these remains. Wetland vegetation is characterized by different levels of nutrients in the following groups of plants: lichens, sphagnum, and hymnals mosses, needles and branches of coniferous trees, leaves and branches of deciduous trees and shrubs, herbaceous plants (Bakhnov, 2005).

Drainage of swamps has a long history - several millennia. Recollection works in the valleys of the Nile, Tigris, Euphrates, and other rivers, drainage of swamps, and irrigation of lands in ancient Rome can be mentioned. The first legal act on wetlands was recorded in 1252 when a law was passed in England to drain land for further agricultural use. The document mentions that Count Russell (on his estate for the first time in British history drainage of the swamp) brought a specialist from the Netherlands, so there is reason to believe that the Dutch developed the basics of land reclamation. However, it would be incorrect to say that these measures were exclusively for agricultural purposes; draining the swamps significantly contributed to improving the climate. Later, in the 15th century, soil drainage was started on the island with the help of ceramic tubes.

Moreover, in 1630 the reclamation works became large: the swamps in the southern part of the Feng district were drained around the island of Ili. To this end, the riverbed was deepened, and a 21-mile canal was built from Irita to the Denver Gateway (called the Old Bedford River). Thanks to these measures, the type of agricultural activity in these lands were radically changed; instead of fishing, hunting, and cane growing, the peasants were forced to reorient to agriculture and cattle breeding. Not everyone agreed with this situation, and therefore began an underground struggle; there were numerous attacks on newly built dams and their destruction.

As there is a small amount of land in the world suitable for agriculture, people continue to look for ways to turn swamps into ordinary soils. Drainage was widely practiced in the Russian Empire, then in the USSR. However, as well as the development of virgin lands, the costs of these activities and the losses significantly exceeded the benefits.

In the second half of the twentieth century, the rate of drainage of swamps in the world was so high that it threatened their extinction in many places. This practice turned out to be irrational not only from the ecological but also from the economic point of view; for example, in the United States, only the lease of hunting grounds in swamps, with huts and shacks, yields much more significant profits than the conversion of these swamps into agricultural land.

Drainage of swamps was practiced in many countries worldwide because it solved many problems for a long time, in particular, gave access to deposits of peat and clay, formed hayfields, pastures, drained water was used for irrigation. However, the drainage process often entails several negative consequences. In addition to the above, drained soils are prone to shrinkage; during the extraction of peat into the atmosphere, a large amount of carbon dioxide is released, which enters the atmosphere

enhances the greenhouse effect, and this leads to the disappearance of unique biotypes of flora and fauna. The adverse effects of drainage have prompted the German government today to step up its efforts to develop a concept for the regeneration of previously drained peatlands, known as the Vorpommern-Initiative Paludikultur.

Reclamation areas of Ukraine are about 4.5 million hectares. The most significant areas are located in Polissya, as this region accounts for almost 70% of all wetlands in our country. As a result of land reclamation, there is a significant decrease in the level and flow of water in such rivers as the Dnieper, Desna, Southern Bug, and Pripyat. And this is in conditions when the need for water resources is constantly growing. Undoubtedly, drainage of swamps brings some benefits in additional agricultural land (almost 12 thousand hectares). However, to a large extent, this activity violates the water regime of the territories, impoverishes the water balance, disrupts the water content of rivers, reduces the yield of adjacent fields, and impairs forest growth (Prysyazhnyuk et al., 2018).

Hydromelioration changes the general hydrological regime of territories and transforms them from ecosystems that fix carbon into territories that emit carbon dioxide during the mineralization of peat, which occurs during its drying due to aerobic microbiological processes. The drainage caused significant damage to the Non-Chernozem zone in the European part of Russia, where thousands of rivers and streams disappeared, and the general drying of the territories began the yield of field crops, and meadows decreased. In some cases, arable land on drained peatlands was unproductive (Mirkin & Naumova, 2002).

The Gidrovia project was a large-scale project that had the chance to destroy the world's unique largest wetland, the Pantanal, located in South America. It was planned to deepen the riverbeds with the subsequent construction of a canal that would directly unite several countries. However, the world's progressive environmental groups have prevented this, and although the project is currently only frozen, there is every chance that it will not be implemented.

In countries with hot climates, desertification (conversion of fertile land into the desert) can result from inadequate treatment of local wetlands.

The most critical factors influencing desertification are relief and climate, soil conditions, not dense vegetation, mineralization of river and ground waters, anthropogenic activity. It is the unfortunate coincidence of these factors that has led to the fact that currently, deserts and lands affected by desertification account for 90% of the total area of land suitable for agricultural use on an irrigation basis in the Republic of Iraq (in 1920, their number was 60% from the total area of the country). The main reason for this situation was the drainage of swamps that formed after the cyclical, seasonal floods of the Tigris and Euphrates rivers due to melting snow in the mountains of northern Iraq. The system of canals and small dams allowed the development of almost the entire lowland marshy area. Modern swamps in Iraq arose on the site of Sumerian canals due to the destruction of irrigation systems and neglect of the rational organization of irrigation work. The drainage of swamps in 1992 was classified as an ecological catastrophe. In dried swamps in the dry, hot climate, a salt desert was formed, crossed by canals. Attempts to use this area for agricultural purposes failed (Bashir, 2010). The disappearance of swamps in Iraq has led to a gradual annual decline in agricultural land. The current situation, complicated by hostilities, does not meet food security standards and threatens the national security of this country, as national agricultural production has long failed to meet the needs of the population, which is exacerbated by insufficient freshwater.

A separate group of bogs consists of peatlands; their total area on Earth exceeds 1 million km2, in Ukraine, peatlands occupy almost 1 million hectares, and their peat reserves exceed 2 billion tons. Therefore, such a vital natural resource as peat should be considered separately.

Peat and materials with its use are firmly entrenched in the economy and everyday life. Extraction of this raw material requires meager costs, and the products of its deep processing bring big profits:

- lipid substance is highly valued in the cosmetic industry;
- in medicine, there is a method of treatment with peat;
- in the process of extraction of peat with gasoline, peat bitumen is obtained, and wich it produces wax, resin, and paraffin, indispensable for the production of polishing oils, leather, paper, wood products and very convenient in the technological processes of precision casting;
- in animal husbandry, peat-based products are used for the production of humic preparations that increase livestock productivity, they are used to make adsorption bedding for poultry, which significantly reduces morbidity and mortality, ensures cleanliness in the farm;

Peat in the form of an additive to the diet of livestock significantly accelerates weight gain and has a positive effect on the condition of pregnant cows; in other animals, it stimulates the increase of offspring, resistance to disease.

In addition, peat in unprocessed form is also widely used: as a fuel with a reasonably high caloric content (inferior to brown coal); an indispensable component for composting, which allows you to make robust stocks of quality organic fertilizers (manure and compost); it is used as a fertilizer, for mulching the soil and much more.

However, due to human negligence during operation, peat deposits often turn into barren black deserts even after recultivation, as industrialists do not leave a suitable layer for plant development at all.

This practice has been of concern to the world community since the middle of the last century. After numerous negotiations at various levels, it was decided to develop a joint agreement on protecting and preserving wetlands. On February 3, 1971, an agreement was signed in the Iranian city of Ramsar, entitled "Convention on Wetlands of International Importance, Mainly as Waterfowl Habitats" (from now on referred to as the Ramsar Convention). The USSR became one of the parties to the Ramsar Convention in 1971 (ratification on December 26, 1975). Our country was recognized as the successor of the USSR on October 29, 1996, respectively, the Ramsar Convention entered into force in Ukraine on November 15, 1997 (Konventsiya, 1971).

The main reason that prompted the countries of the world to sign the Ramsar Convention was that it was the first of the modern instruments seeking to conserve natural resources on a global scale. It is still the only worldwide treaty that restrains the countries joining it from the unthinking, selfish exploitation of their sovereign natural patrimony. It is concerned with the most

threatened group of habitats, the wetlands. These are shallow open waters – lakes, ponds, rivers, and coastal fringes – and any land regularly or intermittently covered or saturated by water – marshes, bogs, swamps, flood plains. For centuries, humankind viewed wetlands as places to drain and convert to more obvious uses, such as agriculture.

Nevertheless, the process had gone so far in the developed countries that the disappearance of wetlands was leading to undesirable consequences - to the loss of groundwater reserves and the consequent need for irrigation, to flash floods, to shoreline destruction, to the accumulation of pollutants, and other subtle disturbances. Many valuable plants and animals dependent on wetlands were disappearing with them. People interested in the conservation of waterfowl and fish were taking the lead in calling for a halt to wetland destruction in the developed countries. Losses were accelerating as highly efficient machinery and techniques for draining wetlands were invented. The developing countries needed help to avoid making the same mistakes, to treat their resources wisely. International action was necessary for several reasons. Many wetlands lay at national boundaries or derived their water supplies from neighboring countries. The circulation of water in the atmosphere was truly international. Fish hatched in the wetlands of one country might be caught as adults in those of another or on the high seas. Waterbirds, migrating over thousands of kilometers twice a year, also ignored boundaries and needed the wetlands of many countries to rest, feed, and breed. Finally, if the developing countries were to be helped to use their wetlands wisely, there must be international arrangements to provide technical and financial aid (Matthews, 2013).

As of September 1, 2020, 169 countries have acceded to the Ramsar Convention, in their territory, of which there are 2182 wetlands of international importance with a total area of almost 208.6 million hectares. In Ukraine, within the framework of the Ramsar Convention, as of 01.01.19, 39 wetlands with a total area of 786,321 thousand hectares are protected.

As mentioned above, the swamp is a unique natural system that combines many species of flora and fauna, so in addition to the Ramsar Convention, Ukraine is a party to several conventions and agreements aimed at the conservation and protection of swamps, including the Nairobi Framework Convention on Biological Diversity. (Ukraine acceded in 1994), Berne Convention on the Conservation of European Wildlife and Natural Habitats (Ukraine acceded in 1998), Bonn Convention on the Conservation of Migratory Species of Wild Animals (Ukraine acceded in 1999), Helsinki Convention "On the Protection and Use of Transboundary Watercourses and International Lakes" (Ukraine acceded in 1999).

In addition to international documents, Ukraine has adopted many domestic regulations that directly or indirectly aim at the preservation and protection of wetlands, including the Resolution of the Cabinet of Ministers of Ukraine "Regulations on wetlands of national importance", "On measures to protection of wetlands of international importance", "On the concept of conservation of biological diversity of Ukraine".

Given the signing of the Association Agreement between Ukraine, on the one hand, and the European Union, the European Atomic Energy Community, and their Member States, on the other, the EU's approaches to addressing the conservation of wetlands must also be taken into account.

A consortium of 23 organizations has recently published a Policy Brief calling on preserving and improved management of peatlands in the EU's post-2020 Common Agricultural Policy (CAP). According to the paper, to facilitate the new environmental ambitions of the Post-2020 Common Agricultural Policy and create coherence between agricultural and climate policies, CAP must safeguard and stimulate the preservation of carbon-rich soils through the protection of peatlands. The paper seeks to achieve three key goals (How can the future CAP..., 2020):

1) guaranteed eligibility of farmed wet peatlands for CAP payments;

2) phasing out CAP payments for drained peatlands; and

3) Establish results-based agricultural payment schemes remunerating ecosystem service provision as low greenhouse gas emissions from peatlands.

New obligations include (EU Budget, 2021):

- preserving carbon-rich soils through the protection of wetlands and peatlands;
- obligatory nutrient management tool to improve water quality, reduce ammonia and Nitrous oxide levels;
- crop-rotation instead of crop diversification.

Several institutes in the world whose mission is to protect wetlands and everything related to them, including the International Mire Conservation Group (from now on – IMCG).

The IMCG is a network of professionals who work in the field of international assistance, promotion, and, where appropriate, coordination of activities in wetland conservation and related ecosystems. In addition, they seek to improve the exchange of information and experiences on wetlands and the factors that affect their functioning at the international level. Researchers, consultants, specialists from government agencies, peat experts, and others join the IMCG with their knowledge and interests. The International Wetlands Protection Group was established in 1984 in Klagenfurt, Austria, and was formed as an organizational structure with the statute, mainboard, and executive committee of the IMCG in 2000. Since then, advisory work and information exchange have been significantly intensified, and an extensive database has been accumulated. According to the IMCG, several wetlands and peatlands are in danger of becoming catastrophic, including several in Europe: two in Poland, two in Slovakia, and one each in Scotland and Finland (International Mire, 2021). IMCG holds annual conferences on various wetland issues, with researchers from Ukraine taking an active part.

Scientists – researchers of climate change have proved that drained peatlands release CO2 and N2O even up to many hundreds of years after initial drainage, the substantial greenhouse gas emissions from peatland drainage can largely be avoided through peatland rewetting and restoration (Barthelmes et al., 2009). Scientists worldwide offer a large number of developments aimed at the ecological use of the potential of wetlands without draining them and destroying unique ecosystems.

Peat soils are usually considered low-scoring because their assessment considers several additional factors, including how the plants behave on them during frosts. After all, the whole crop can die. However, soybeans on peat soils give excellent yields. In

the old drained riverbed with muddy soil, agricultural producers receive yields of up to 40 centners per hectare. In addition, soybeans are nitrogen-fixing plants, so there is no need to apply nitrogen fertilizers (Volkov, 2013).

The world breeding industry has already created several types of grass that can give high yields on too moist soils. In particular, the hybrid clover is suitable for growing on peat-swamp soils, successfully tolerates acidity to pH 4.5, and can withstand flooding for up to 20-24 days. Usually, the yield of hybrid clover is 400-500 kg/ha of green mass and 70-80 kg/ha of haylage. This plant provides grass cover for three years (Vasko & Borovik, 2013).

Not wholly destroyed peat bogs can also be restored. Unique technology for the restoration of peatlands with the help of berry crops has been developed and tested. It consists of planting cranberries, blueberries, and lingonberries on peat bogs. These plants begin to yield briefly, and the land is returned to agricultural use (Belorusskiye torfyanniki..., 2017).

Conclusion

1. The potential of Ukraine's wetlands is used to a minimal extent. In particular, given the incredible popularity of folk medicine, it would be appropriate to pay more attention to collecting and using wild medicinal plants of swamps. Global trends in healthy and organic nutrition provide an excellent opportunity to develop harvesting and processing of forest ecologically clean berries. After all, today, the export of such raw materials from Ukraine is growing, but the added value that can be obtained through the use of new technologies of storage and processing is lost. Mushrooms, berries, and herbs are exported to different countries of the world, returning to our country in the form of finished products and semi-finished products.
2. In the EU countries, the berry industry is relatively developed; in particular, the Republic of Poland primarily meets the need for berries (raspberries, strawberries, blueberries, cranberries). Special plantations have been set up to grow these berries, which is why the wild berries of Ukrainian swamps have every chance to become profitable and competitive products on world markets.
3. Ukraine's activity in the international movement to protect and conserve wetlands has intensified significantly since independence. The seriousness of the approach to this issue in our country is evidenced by the fact that of all the countries of the former Soviet Union, except for Ukraine, only representatives of Armenia and Belarus were invited to the conference.
4. At the national level, more attention needs to be paid to the environmental aspect of using the potential of national wetlands. To this end, scientific research should be intensified, the possibilities of implementing the developments of researchers from other countries should be more carefully considered, and a wide range of interested public, especially environmental NGOs, should be involved in the process.
5. An essential task for the tourism industry is to consider the conditions for developing wetland tourism in Ukraine, as is the case in the United States.

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