

Ecological Problems of Ukraine after World War II

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Abstract. It is found that the quality of work for land irrigation and drainage was poor, which ultimately led to a number of problems: the flooding of fertile land, reshaping of the coast. The influence of important hydrodynamic factor, which was wind waves, as well as the attempts of the Soviet government to overcome the negative effects of human impact in 1960, which appeared in an attempt to create ravines and gullies shelterbelts was examined. However, the planned volume of work on the creation of protective forest plantations in areas of reservoirs was not fully completed. The causes of the erosion control work plans failure were discovered. The article noted the fact that the transformation of river systems under the influence of economic activity changed the natural processes of water quality irrigation sources formation.

Keywords: hydraulic engineering, irrigation, planting shelterbelts, anti-erosion works, land reclamation

A resolution «On plan shelterbelts, implementation of grassland crop rotation, construction of ponds and reservoirs to ensure high and stable yields in the steppe and forest-steppe regions of the European part of the USSR» was adopted on October 20, 1948 by which an active work on the implementation of the plan began in Ukraine. This was the beginning of the enforcement of the Great plan of nature transformation. This work continued with varying intensity of the 60-ies of the XX century. During this period a huge amount of work on forestation of the steppes, drainage of wetlands, creation of reservoirs, irrigation canals, ponds and reservoirs was really done. However, one should ask a question what was the result of the implementation of measures envisaged by the above-mentioned Resolution.

At one time L. Sumsky, M. Myhaylyuchenko, Y. Teleshek, M. Cherkasova, M. Zhurba, B. Boreyko, G. Dobrovolsky researched the problem [1]. However, modern research opportunities and access to the sources highlight the still little-known stories of these problems.

The article is a study of environmental impacts and drainage works which were carried out according to the Great plan of nature transformation in Ukraine.

Implementation of developed and included into the Great plan of nature transformation measures to change the nature often left much to be desired. This was due to a number of reasons: changes in the apex of power in relation to changes of the Great plan of nature transformation, lack of funds, neglect of local authorities and administration of a number of farms. The whole set of reasons led to the fact that in the early 60s of XX century Great plan to transform nature was gradually minimized and have not brought it to its logical conclusion.

It is clear that in such circumstances a number of works were executed poorly, and even more so when their performance is practically not taken into account, which may have the consequences for the environment.

Great damage in Ukraine was caused by the creation of «man-made seas» – Kanev and Kiev reservoirs that buried hundreds of thousands of hectares of fertile land. Only in the construction of the Kakhovka reservoir a unique horse yields smooth (60 thousand ha) was flooded [2, p.384].

Generally in the USSR in the 60s of XX century there was flooded 4.2 million ha of agricultural land area in un-

der-developed regions. A researcher (geographical sciences) O. Lyesnova mentioned that in Ukraine as a result of the creation of the cascade of hydropower stations on the main river 600 thousand ha of the best fertile land was lost.

Taking into account that creating of the reservoirs disturbed the dynamic natural equilibrium and reorganization of the coast – erosion began, as well as sliding or accumulation of deposits.

According to the Ministry data in early 1960s reservoirs along the coastal strip had 40 fiercely-beam systems and many individual gullies. Because of the strong current ravines and destruction across the shores by flooding, landslides, narrow beam backwater poured [2, p.10].

As scholars recognized ravines grew toward watersheds, inflicted considerable damage to the valuable land, flooded the roads [3, p.11].

There was rinsing of the fruit-bearing layers of soil. It happened because of the excavation of slopes. For example, this happened with fields of collective farm named after Lenin, adjacent to the beam Mykytynska. As a forester of the Gavrilovsky Forestry P.A. Lehkostup proposed, it was necessary to change the cutting of the fields and perform plowing across the slope, while the collective farms «The path of communism», «Zarya communisma» carried plowing in order to increase the crop area, which contributed to the erosion of the slopes [4, p.8].

The basic hydrodynamic factor – wind waves. The height and morphology of the coast also affect the intensity of their reorganization, convex slopes eroded faster and erosion rate increases with the slope. Sloping beach with a slope of no more than 2 – 4 degrees usually not blurred. With increasing height shore erosion rate is also reduced due to the rapid formation of shoals.

Currently the coastline of Dnipro reservoirs is 3079 kilometers, of which 1,110.9 kilometers – abrasion-erosion banks that need fixing. Due to destruction of the coast there were lost 6,176 hectares of land. Over the past 35 years the reservoir has received more than 337 cubic meters of product destruction shores. This often happened because of low technological culture of agricultural workers. S. Moyseyenko, a forester of Velike Lepetyhske Forestry of the forestry enterprise Kahovsky in the memorandum informed the head of Kherson Interregional forestry management that in the Velike Lepetyhske, Hornostayiv-

ka and other regions there was the most exposed strip of coastal erosion in Kakhovka reservoir with a system of gullies and ravines. Some managers and users have been fighting unsuccessfully with soil erosion, on the contrary, their actions have contributed to intense erosion, landslides and washouts of arable horizon. For example, farm «Seaside» in Hornostayivka district had beam horticulture, land adjacent to the farm, and the square of land number 66 for the purpose of state forest planting of grass. The effect was bad, plowed layer was washed by the waters [4, p.7].

Trying to overcome the negative effects of human impact government adopted a special resolution of the Council of Ministers of the Ukrainian SSR № 638 of April 30, 1960 «On organization of the combat with soil erosion on the territory of the USSR» [4, p.1]. However, its effective execution could not be reached.

From 1932 to 1956 in Ukraine there were created forest stripes. However, the hydrographic network of agroforestry was made in limited quantities. In catchments that have been used in agriculture, at the time there was not a complete erosion of forest plantations system yet [5, s.124].

In many cases, planting protective forest plantations in ravines and on steep disagreed with the construction of waterworks on strengthening ravines. The result was the further erosion and shelterbelts destroyed [3, p.5].

In the memorandum of Gavrilovsky Forestry forester P.A. Legkostup to the Head of Kherson Interregional forestry management and afforestation shelter V.A. Ponomarenko indicated that in the Novo Vorontsov district, Kherson region most part was subjected to erosion, as well as coastal strip with a system of beams and ravines that are adjacent to the Kakhovka reservoir [4, p.8].

Moreover, there was no fully completed the planned volume of works on creation of protective forest plantations in areas of reservoirs.

The amount of work on afforestation, erosion and eroded lands along the shores of reservoirs was carried out in accordance with the technical projects made by the expedition «Ahrolisoproekt» in 1952 [6, p.14]. However, greater difficulties in achieving planned afforestation began in the second half of 1950.

According to the technical design of protective plantings along the shores of Kakhovka reservoir had to be created in the period from 1956 to 1962 and occupy 5685 hectares in Kremenchug reservoir creating all kinds of protective planting area of 4485 hectares had to be completed in 1959. But that year the plan was performed 85.2% and 51.8% [3, p.12].

For the Kremenchug reservoir creating of all kinds of protective plantations had to be completed by 1959. But with the total area of 4,485.3 hectares in 1959 work was done only for 2,323.38 hectares or 51.8% of the plan [5, p.4].

Plans of afforestation of reservoir banks were not performed in the 1960s. So, according to reports of the Main Directorate forestry and logging the Council of Ministers of the Ukrainian SSR in early 1961 from the planned afforestation of Kremenchug reservoir (1023 ha) were made only 639 hectares and from the planned afforestation of Dneprodzerzhinsk reservoir (2327 9 thousand ha) were made only 176 ha [6, p.5].

Forestry could not cope with the volume of all the works that belonged to them. The reasons are as follows: failure to obtain technical project for carrying out afforestation reservoirs, lack of sufficient manpower (e.g. in Kremenchug reservoir all the work had to be performed by one Zhovnynske forestry), areas which were subject to afforestation were not suitable for the use of tractors for this work, it required more manual labor [6, p.5].

This only leads to attempts in emergency mode to execute all volume of the work. A striking example is the conduct of afforestation channel in the Donetsk region. In the same area with the total area of sowing and planting forest in state forest on the channel Seversky Donets – Donbass there were planted 75 hectares with terms of 49, or 153.1%, and in Artemovsk reservoir channel there were planted forest crops on an area of 45.5 hectares, all possible to afforestation area. In Grabowski reservoir 22 hectares of forest crops were planted on an area of 32 hectares. In total in reservoirs 77 hectares or 114.9% of land was planted [5, p.3].

According to the Head of Ukrainian State Forestry F.Osadchyy information to the Council of Ministers of the Ukrainian SSR in March 1960, due to mass fallouts on the Dniester wetlands for agriculture, and too poor care of the spawning areas of fisheries management organizations, fishing catches in the Dniester area decreased, compared with pre-war period, in 10 times [1, p.56]. He anxiously warned that tens of kilometers along the land borders of the Ukrainian SSR above all fenced dams. Thus recent spawning lower reaches of the Dniester completely deprive fish natural reproduction base [1, p.55].

Threatening situation of fisheries in the early 50-ies exists in the Dnieper basin. A Decree «On measures to increase fish stocks in Dnieper River and its tributaries» was issued. This resolution envisaged two reserves – Ust-Pripyat and Middle Dnipro.

But after the construction of Kakhovka and Kremenchug reserves the entrance of the river was blocked for spawning sturgeon, with which Dnipro previously was famous [1, p.51].

Moreover, due to erosion and the creation of man-made sea riverine landscape intensified the process of blue algae blossom, which poses a serious threat to human health directly.

Considerable damage the ecological situation in Ukraine caused the steppe zone and construction of irrigation canals. Primarily this is due to negligent of performance of the builders' duties, so that most of the channels when transporting it lose water by 50 – 80% of that goes into the ground [1, p.105].

Pivnichnokrymsky channel that was built without a waterproof film inflicts serious harm and drainage situation in Northern Crimea. A sprinkler system passing through the Kherson region near Askania Nova started flooding unique virgin lands of Ukrainian steppe.

The fact that the transformation of river systems under the influence of economic activity changed the natural processes of formation of water quality sources of irrigation. The main features of the transformation of river systems in Quaternary: reducing runoff mouths; overregulation runoff of hydrographs divergence with the creation of channels increasing cultivated land and siltation bed

products of water erosion, increase of base erosion, drainage and irrigation [2, p.133].

Analysis of changes as sources of irrigation in beds of major rivers in Ukraine (Dnieper, Dniester and Southern Bug, Danube, Seversky Donets) showed that in 1956 (before the large-scale irrigation) generally increased pH, salinity of water, its aggressiveness towards concrete and metals, the ability to cause irrigation water salinity, alkalinity of soils and surface fouling of pipelines and valves [2, p.133].

During the restructuring, in 1985 work on the expansion and modernization of irrigation systems created in the USSR, have been terminated, and the system was destroyed and put out of order. As a result, agricultural water supply was decreasing and in 2004 hovers around 8 km – 3.4 times less than in 1984. In 1980 the forest belts planting was carried out at a rate of 30 thousand ha per year.

An ambiguous situation was with the impact of land drainage works. Back in 1946, when the Ukrainian village of rampant hunger, the initiative was launched by Khrushchev economically unjustified for the development of the floodplain of the Dnieper, its tributaries Irpin, Ostra and other rivers [3, s.356].

In mid-August 1947 the Central Committee of the Communist Party of the Ukrainian SSR and the Republic of Moldova adopted a joint resolution «On implementation of the tasks set by Comrade Stalin on irrigation arid areas of Southern Ukraine», and on October 18 of the same year there was adopted the Resolution «On development of irrigation and drainage of the river Irpin in the Kiev region», which was supposed to cover 2,152 hectares [4, p.6].

In 1948 an active work on reclamation of Irpin began. And in the early 50-ies of the XX century and more recently, game rich in fish and overflowing with picturesque river floodplain meadows were destroyed. River was leveled and transformed into a direct channel. A light layer of peat on the banks of Irpin subsequently because of the blowing wind began performing sand [2, p.101].

An important component of the plan was the transformation of nature and land drainage of Ukrainian Polissya. It should be noted that such intent existed in the prewar period. But then realization of these plans a war has prevented. Great plan to transform nature had to be provided for 15 years to drain about 4 mln. ha, including 1897 in the Ukrainian SSR [3, p.100]. In general a transformation of Polesie envisaged the building of 37 reservoirs and 2100 ponds, leveling 24 thousand km a year, draining 4,810 thousand ha of wetlands (1,897 thousand in Ukraine), the construction of 81 hydroelectric power plants [3, p.100].

However, after the start of a large-scale campaign for land reclamation and drainage of wetlands, which actively unfolded after 1948, it was found that despite the expected impact on reclaimed lands mowing grass has not increased, but rather decreased [2, p.356].

So, the quality of work for land irrigation and drainage was poor, which ultimately led to a number of problems: the flooding of fertile land, reshaping of the coast. The influence of important hydrodynamic factor, which was wind waves, as well as the attempts of the Soviet government to overcome the negative effects of human impact in 1960, which appeared in an attempt to create ravines and gullies shelterbelts was examined. However, the planned volume of work on the creation of protective for-

est plantations in areas of reservoirs was not fully completed. The causes of the erosion control work plans failure were discovered. The article noted the fact that the transformation of river systems under the influence of economic activity changed the natural processes of water quality irrigation sources formation.

Almost immediately after the implementation of the tasks assigned to the Soviet society shared by the Council of Ministers and the Central Committee of the CPSU (b) on October 20, 1948 «On the plan of the shelterbelts, implementation of grassland crop rotation, construction of ponds and reservoirs to ensure high and stable yields in the steppe and forest-steppe regions of the European part of the USSR» works devoted to coverage of various aspects of the Great plan of nature transformation began to appear.

In the first half of 1950 more detailed work began to appear, the authors have conducted an analysis of the climatic conditions of forest-steppe and steppe regions of Ukraine. In this period, works of the authors such as D. Hook, I. Romanenko, V.N. Sukachev, LM Sumy, P.S Slipchenko appeared.

The next phase (1960s – mid 1980s) of the Soviet-era historiography themes reflected some intensification of writing the researches on a problem raised by us. The works dedicated to the great constructions on the Dnieper river appeared. We already know P.S. Slipchenko with a group of other writers, including A.B. Bocharnykov, B.I. Rutkowski, A.A. Zhukov and L.M. Osypchuk, they published their work «Experience of the construction of the canal Dnepr – Krivoy Rog», which analyzed and summarized the experience of building of a new main channel. L.G. Budkina also analyses this period of creating Kremenchug reservoir and its consequences for surrounding areas. However, the author highlights the problems rather one-sided.

Disclosure of the role and place of the Communist Party during the implementation of the Great plan of nature transformation was in a small book of stories by P.Y. Koshelev. There was notable at that time the work of D.F. Virnik «Development of National Economy of USSR: 1917 – 1967».

In the early 80-ies of XX century the first works began to appear, whose authors try, as far as possible in contemporary terms, to reflect critically the impact of human activity on the environment. In particular, V.E. Boreyko in his «History of Nature conservation of Ukraine (X century – 1980)» attempted to show the history of nature conservation in our country.

The new stage of the Soviet historiography of the theme we have chosen is associated with the beginning of Gorbachev's «perestroika» (mid 1980s – 1991); at this time the works of such scholars as V. Jamal, M.M. She-myakin, B.R. Buldey, V.M. Tribunskii, Y. Babenko and B.A. Faybyshenko appeared.

New political processes that began in Ukraine in the early 1990s and the declaration of its independence, started the post-Soviet, modern historiographical period. It is under the review of the Soviet concepts in the study of post-war events and phenomena of that period. Some stories on implementation of measures according to the Great plan of nature transformation, seen at this time in the works of V. Lytvyn, B.D. Payovik and P.G. Vaku-lyuk, who gives a positive assessment of the Great plan of

nature transformation as the one program activity that contributed to the reforestation in Ukraine.

Thus, in the Soviet and post-Soviet period many subjects related to the study of climatic conditions of Ukraine has been studied, as well as their impact on the level of agricultural productivity, development and practical implementation of the Great plan of nature transformation and the study of economic and environmental consequences of its implementation. However, despite the achievements, the topic we raised is poorly studied, there are no special generalization works. This is the necessity of further research and comprehensive coverage.

So, unfortunately, Great plan to transform nature and

(even to the greater extent) its physical implementation had significant shortcomings, caused mainly by insufficient considering and understanding of steppe ecosystems.

After all, serious anthropogenic interference with the natural environment of the Dnieper basin has led to a wide range of changes – changes from minor to complete destruction of ecosystems not only of the river and its tributaries, but flooded areas and coastal land. Comprehensive assessment of ecological state of reservoirs helped to identify its main negative factors: anthropogenic pollution, over-regulation of the Dnieper River and its tributaries, re-contamination. These factors were closely intertwined and conditioned each other.

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