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CLIMATE MONITORING AS AN INDICATOR OF THE STATE
OF NATURAL LANDSCAPES

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The optimal development strategy for the socio-economic development of Ukraine needs research of specific linkages between natural and socio-economic formations, as well as the research of large-scale and deep-seated violations of the functions of the natural landscapes and their constituents. This also applies to the most resistant to the negative impact of human activity component of the biosphere – the atmosphere and its climatic constituent.

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Methodology. The research material is climatic temperature series at twenty-five meteorological stations for the periods 1961–1990 and 1991–2022, which characterize the temperature regime of Ukraine. To obtain general features of the climatic conditions of any territory, the information is provided using statistical parameters: the minimum and maximum value of the indicator, and the average value, which is chosen as the basis for analysis.

Results and Discussion. Attempts to master and adapt to climate change have become a global challenge that requires coordinated international cooperation [1–6]. The average air temperature of the surface layer of the atmosphere changes with a speed which goes beyond natural cyclical fluctuations. Besides, there is the general trend towards directed climate change, the so-called “global warming”, which threatens natural landscapes, and causes their violation and degradation.

The driving international step was the Paris Agreement, which contains a plan of social actions aimed at reducing the level of greenhouse gas emissions.

The emergence of the Concept of the “green” energy transition of Ukraine by 2050 [7] is due to a noticeable change in approaches to the development of energy in the world in terms of its environmentalization and decarbonization, with a special attention to emphasizing the problem of combating climate change.

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The concept of implementation of state policy [8] fixed the actions of the government in the field of climate change for the period up to and including 2030. Variability of the temperature regime and humidity directly leads to changes in the local and regional climate. The authors studied the trends of temperature and humidity changes in the territory of the country at the end of the 20th and the beginning of the 21st centuries [9–11].

Forecasting future strategies for prevention and adaptation to likely changes is an important task for scientists. The main negative consequences of climate change in Ukraine include: an increase in hazards to human health, abnormal hydro-meteorological phenomena; a decrease in the number of crops harvested; a spread of water supply problems; an increase in the areas of degraded and deserted territories; tendency to rapid degradation of natural landscapes.

The studied territory has a large area and length from west to east. This feature determines the nature of the multi-year regime of temperature conditions in different regions of the territory.

Analyzing the deviations of average annual temperatures in the north of the territory for two periods (1961–1990 and 1991–2020), we get a generalized indicator of deviation, which is 1.4°C in the direction of warming. In general, the zone of mixed forests in comparison with other natural zones tends to have significant warming indicators.

Such changes in the temperature regime of the territory lead to a change in the humidification regime, restructuring the course of daily and annual air temperatures inherent in this area. An increase in the frequency of fires in swamps due to drought and a decrease in the severity of the winter period has already been recorded. The north of the territory is especially subject to these changes.

During the period of 1991–2020, winters with little snow, thaw and icy rains, which occur under conditions of positive air temperatures and their significant fluctuations from negative to positive values, became frequent. This has a negative impact on the country's temperature regime and affects the state of water and agroclimatic resources.

The annual course of air temperature in the country is characterized by stable deviations from the period of 1961–1990. The distribution of temperatures is significantly influenced by physical and geographical factors that significantly change the local conditions of weather stations and lead to the formation of the microclimate of individual territories.

During the period of 1991–2020, the air temperature and its deviations had a pronounced tendency towards warming, which continues from the period of 1961–1990. This indicates that the features of general global changes are inherent in regional temperature changes.

Such amplitudes of air temperature fluctuations significantly depend on the spatial variability of regional atmospheric circulation and topography. The territory of the country has a significant horizontal extent, the studied territory is characterized by special climatic conditions, and even within one natural zone there is a violation of the general course of air temperature.

During the last period of research the water problem has worsened: due to the lack of the necessary percentage of snow feeding the rivers and the lack of conditions

for the formation of aquifers, which harms the overall structure of the water resources of the territory. Winters with little snow are also associated with the drying up of swamps in the studied area, depletion of underground water reserves, drying up of wells in many regions, and freezing of crops that are not used to such conditions. Recorded an increase in the frequency of fog in winter. The totality of these atmospheric phenomena leads to the aggravation of existing contradictions.

There is a causality between climate-related changes, the influence of anthropogenic activity, and the reaction of the landscapes on them. This can be shown in the creation of a big variety of transformed landscapes (agrarian, residential, industrial, transport, aquarium, forest, etc.), which are associated with a certain type of management (land reclamation, land use in agriculture, land recultivation, disturbed by the mineral extraction), the usage of land for functional designation (within the housing and public building, transport, handling wastes). The consequence of anthropogenic transformations is the change in the parameters and characteristics of the components of nature (geological structure, relief, climate, waters, soils, flora, fauna, etc.).

Conclusion. The climatic parameters of a certain territory may differ from the zonal climate and along with anthropogenic transformation can affect the general condition of landscapes, lead to the activation of inert hydrometeorological and exogenous geodynamic processes and phenomena (erosion, deluvial processes, landslides, suffusions, deflation, under flooding). Distinguishing the component of each of them and determining the indicators of these changes is possible on the base of special monitoring research. Indicators provide the basis for the formation of information blocks as the basis for decision-making for socio-economic development and allow focusing on socio-economic, socio-political, and environmental issues of regions of different ranks consciously.

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ԿԼԻՄԱՏԻ ՄՈՆԻՏՈՐԻՆԳԸ՝ ՈՐՊԵՍ ԲՆԱԿԱՆ ԼԱՆԴՇԱՓՏՆԵՐԻ ՎԻՃԱԿԻ ՑՈՒՑԻՉ

Ամփոփում

Ուկրաինայի սոցիալ-տնտեսական զարգացման օպտիմալ ռազմավարությունը պահանջում է բնական և սոցիալ-տնտեսական ձևավորումների միջև կոնկրետ կապերի ուսումնասիրություն, ինչպես նաև բնական լանդշաֆտների և դրանց բաղադրիչների գործառնությունների լայնածավալ և խորը խանգարումների ուսումնասիրություն: Դա վերաբերում է նաև կենսոլորտի այն բաղադրիչին, որն առավել կայուն է մարդու գործունեության բացասական ազդեցությանը՝ մթնոլորտին և դրա կլիմայական բաղադրիչին:

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КЛИМАТИЧЕСКИЙ МОНИТОРИНГ КАК ИНДИКАТОР СОСТОЯНИЯ ПРИРОДНЫХ ЛАНДШАФТОВ

Резюме

Оптимальная стратегия социально-экономического развития Украины требует исследования конкретных связей между природными и социально-экономическими формациями, а также исследования масштабных и глубоких нарушений функций природных ландшафтов и их составляющих. Это касается и наиболее устойчивой к негативному воздействию человеческой деятельности составляющей биосферы – атмосферы и ее климатической составляющей.