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ODDÍL 14. EKOLOGIE

*§14.1 SYSTEM OF SOCIAL AND ENVIRONMENTAL MONITORING AS A BASIS FOR ENVIRONMENTAL SAFETY OF POPULATION OF CITIES (***Yorkina N.V.**, Melitopol State Pedagogical University named after Bohdan Khmelnitsky**, Cherniak Ye.B.,** Melitopol State Pedagogical University named after Bohdan Khmelnitsky)

Introduction. The constant increase in anthropogenic influence on urban systems increases the interest in monitoring studies. The implementation of complex approaches in monitoring, where sanitary and hygienic monitoring data are used along with technical and bioindicative methods, remains relevant. This makes it possible to objectively assess the degree of transformation of soils, water resources, and the atmosphere in order to predict their changes and impact on the health of the city population, as well as to develop an effective program for optimizing the urban environment.

The program of socio-ecological monitoring, taking into account sanitary and hygienic data, provides an answer to the question of the general toxicity and mutagenicity of polluted environmental objects and the degree of their danger to biota and humans, that is, it contributes to the solution of a number of urgent environmental problems of the city in the system sustainable development. Urban systems emerged natural and anthropogenic complexes consisting of architectural and construction objects and transformed biocenoses [1, 3, 4, 11]. According to modern forecasts, urban systems will become the main habitat of the majority of humanity. On the one hand, urban systems are areas of the biosphere where the level of anthropogenic load is maximum, on the other hand, it is important to create favorable conditions for

peoples. This problem can be solved by effective management of the environment of the city. Environmental monitoring is the basis of managing of any territory. However, traditional approaches to the study of urban systems are ineffective.

As a rule, their use is reduced to establishing some sources of pollution of individual components of the urban environment (vegetation, cover, etc.). At the same time, any city is a complex system, consisting of parts with different purposes, which are in relationships of interconnection and interdependence. Therefore, the environmental monitoring of the state of the urban systems should be based on a systematic approach to studying the problem. Modern studies of the state of ecosystems are based on the unity of their structural and functional organization. However, the mechanical extrapolation of this methodology to the study of the urban area does not give satisfactory results. This is due to the specificity of the city environment, the character of its formation and structure differ from the natural one. Unlike the ecosystems, social factors prevail in the urban systems, its conditions are largely created by the man's activity. At the same time, man, unlike other species, creates an environment not only for the purpose of creating more favorable conditions for his living, but also for the purpose of organizing his production activities. At the same time, a complex approach to monitoring the urban systems, taking into account its specific, is quite possible. Urban systems are a type of natural-anthropogenic systems. Their condition is determined by a complex system of interaction of both anthropogenic and natural factors affecting both structural and functional characteristics [3, 5]. At this time, there is no generally accepted opinion about the structure of urban systems. Urban building complexes, the spaces between them, and transport communications are often considered as the main elements of the structure of cities. However, despite of the existence of these structures, it is impractical to carry out

environmental monitoring according to this principle. The results of such studies characterize only the distribution of pollutants in the "external" urban system and changes in her components (vegetation, fauna, etc.) due to anthropogenic load [8, 10, 11]. The main element of the urban system a person does not fit well into the program of such monitoring. Unlike other organisms of urban systems, people do not live in specific urban biotopes: on the surface of buildings, between buildings, on the transport communications, etc. The human habitat has a different character. Distributing on the territory of the city in accordance with the choice of place of work, communication, people "consume the environment very selectively". That is, each person has his own habitat, the so-called "area of activity". There are not only individual, but also group sites of activity, which represent the totality of places visited during, for example, a week's life cycle. In this connection, attention should be paid to the other side of the organization of the urban system the functional one. Its basis is the administrative management of the city.

According to the analysis of literary data, a person is a resident of a specific district. People living in the territory of one district can be considered as a single object. At the same time, the organization of monitoring only on the basis of an administrative structure represents another extreme. In order to obtain information about the state of the environment, it is necessary to study all the main elements of the urban system - atmospheric air, soil, etc. It is obvious that the zoning of the territory and the selection of sampling points should be carried out taking into account the urban topography and other factors not directly related to the management system. The purpose of our work is to reveal the features of social and ecological monitoring of the environment. Based on the goal, the following tasks were identified:

1. Consider the types of environmental monitoring of the urban area.

2. To reveal the specifics of the organization of an effective system of social and environmental monitoring.

3. Outline the peculiarities of medical and biological monitoring as the basis of environmental safety of the population.

4. To determine the main principles of the organization of complex environmental monitoring in the urban system.

Results and discussions.

1.1. Structure and types of social and environmental monitoring.

When considering the structure and types of environmental monitoring, first of all, it is necessary to differentiate the concepts of "environmental monitoring" and "environmental research". These types of environmental activities are equally important and mutually complementary, but they have completely different goals. Monitoring consists in operational monitoring of the environmental situation. The goal of ecological research is to study the processes occurring in the environment. Environmental monitoring is a traditional tool for managing the state of the environment. However, in the conditions of an urbanized environment, there are some peculiarities of its organization. Traditionally, separate sources of pollution are established in cities. This does not take into account the complexity of the organization of the urban system, the presence of various parts in its composition. Therefore, the process of socio-ecological monitoring of the state of the environment of urban systems should be based on a systemic approach to studying the problem [1, 3-6]. In today's realities, tools for monitoring the state of the city environment must be fast and effective. Therefore, socio-ecological monitoring as an integral system of continuous observation for the purpose of rapid assessment and forecasting of

the state of the environment. Socio-ecological monitoring is becoming the most important part of state control. It is necessary to timely assess both the consequences of anthropogenic impact on biota, ecosystems, and human health, as well as the effectiveness of environmental protection measures [8, 10-12]. After all, monitoring is not only the observation and evaluation of factual material, but also experimental modeling, forecasting and specific recommendations regarding the expedient management of the state of the environment. According to the territorial principle, three blocks of modern monitoring are distinguished - local (bioecological, sanitary and hygienic), regional (geosystemic, natural and economic) and global (biosphere, background). The program of bioecological (sanitary and hygienic) monitoring, which is carried out at the local level, includes observations of changes in the content of pollutants with carcinogenic, mutagenic and other adverse properties in various areas.

In order to establish the ecological state of the territory, the content of the most dangerous environmental pollutants is determined:

- carbon oxides, sulfur dioxide, ozone, dust, heavy metals and radionuclides, aerosols, nitrogen, phosphorus, benz(a)pyrene, hydrocarbons (atmospheric air) [1, 13];
- radionuclides, heavy metals, pesticides, petroleum products, benz(a)pyrene, phosphorus, phenol, nitrogen, the level of mineralization and pH (surface water) are established;
- heavy metals, radionuclides, benz(a)pyrene, pesticides, nitrogen, phosphorus (biota) [15].

The level of radiation, noise, vibration, electromagnetic radiation and other harmful physical factors is also determined in the process of conducting monitoring studies of urban systems.

It is no accident that ecological observation points are located in places of the highest concentration of population and in

areas of its intensive activity. First of all, with such calculations as to control human connections (trophic, phoric, topical) with the main components of the environment. Territories where "dirty" industrial enterprises, nuclear power plants, energy carriers, oil refineries, agricultural enterprises that use toxic chemicals are located deserve special attention [14]. In the process of socio-ecological monitoring, the dynamics of birth defects and genetic defects in newborns due to intensive environmental pollution are established. It is difficult to overestimate the ecological danger of mutagens, because "mutagens affect the most precious thing created by the evolution of living matter - the human genetic program, as well as gene pools of populations of all kinds of animals, plants, bacteria and viruses that inhabit the global ecosystem of the Earth" [1, 7, 12]. Regional monitoring involves observing the state of mesoecosystems (river basins, forest ecosystems, agroecosystems and recording deviations of the studied parameters from background indicators. Thanks to anthropogenic influences at the geosystem level, disruptions in trophic relationships are studied, the possibilities of using resource potential at production enterprises are analyzed, changes in quantitative indicators of anthropogenic impacts on the environment [3, 4].

Monitoring and forecasting of significant biosphere changes is the task of monitoring studies at the global level. Changes in the atmosphere, hydrosphere, flora, and fauna are considered in interaction with the human habitat. Therefore, the United Nations Organization (UNEP) and the World Meteorological Organization (WMO) participate in the development of a monitoring program at the global level [1, 3]. This program is aimed at:

- organization of an extensive system of preventive measures to preserve human health;
- assessment of climate change at the global level;

- determination of the presence of pollutants in the trophic chains of biosystems at different levels of organization;
- delineation of the spectrum of problems in agro-ecosystems due to unbalanced land use;
- establishing the negative impact of environmental factors on environmental components;
- assessment of the level of pollution of marine and other macroecosystems;
- development of a program for the systematic prevention of natural disasters at the international level.

The system of socio-ecological monitoring of Ukraine covers local, regional and global levels. Thanks to the generalization of the results of monitoring observations, it becomes possible to obtain objective data on the course of natural processes and anthropogenic pressure on the country's ecosystems in a timely manner. For this purpose, stationary and mobile control points, stations and laboratories are organized. Aerial machinery and aerospace equipment are used, thanks to which the level of aero-technological pollution, the condition of the soil cover, watercourses, raw resources of the subsoil is monitored, and the protection of the diversity of flora and fauna is ensured [1, 11].

The state environmental monitoring system is based on the observations of the hydrometeorological service and the environmental monitoring center. The main tasks of monitoring are the creation of a data bank on the ecological situation in different regions of the country, the comparison of the received information with the data of international ecological information systems, the assessment and forecasting of the anthropogenic load on ecosystems of various levels, and the establishment of the health status of the population [10, 12].

Therefore, the implementation of social and environmental monitoring should be based on the following principles:

1. The monitoring program must be realistically feasible. This can be achieved only by selecting from a large array of indicators that characterize the state of the environment in relation to a small number of key parameters, the tracking (monitoring) of which allows for an adequate assessment of the existing situation and forecasting its further development. At the same time, the selection of a complex of key parameters does not exclude the study of other indicators that could clarify some aspects of the ecological state of the territory. Thus, the environmental monitoring program may include two groups of predetermined indicators: a) mandatory, constantly measured parameters that provide a general assessment of the state of the territory; b) additional, necessary to clarify certain aspects of the environmental situation [1].

2. A specific feature of social and ecological monitoring of the urban territory is that its ultimate goal is to ensure favorable living conditions for citizens. The fundamental difference between ecomonitoring of urban areas and such in the natural environment is that the object of research here is not an ecosystem, but an urban system. Despite the fact that even in urban conditions, an environment conducive to life can be created only if it contains all the main components characteristic of natural ecosystems (vegetation, soil, etc.), its main component is a person. On the one hand, it creates conditions in the urban system, that is, it is its only one species, on the other hand, favorable conditions are created for humans in the urban system. All other forms of life in urban systems either adapt to the conditions that have been created, or their numbers are artificially supported and regulated by man for one or another purpose, including to create a favorable habitat, but again favorable not for these forms, but for itself. Thus, if we proceed from the real goals of ecological monitoring of the urban territory, its main concept at this time is anthropocentrism. In this

regard, the choice of mandatory environmental monitoring parameters (and, if necessary, a set of additional indicators) should be based on the materials of social and hygienic monitoring [4, 5]. As practice shows, if the monitoring of the urbanized area is based on similar programs developed for ecological monitoring of the natural environment, its results, as a rule, allow only to record certain unfavorable trends. The obtained data do not reveal a reliable connection between the environmental conditions and their favorability for the comfortable living of the city's residents, therefore effective measures cannot be developed on their basis. "Reliable connection" in this case means establishing a correlation between the state of health of the population and the dynamics of indicators of the state of the urban system in which they live, and not a priori judgments based on purely biological or geochemical materials.

3. The possibility of actual implementation of environmental monitoring programs depends to a large extent on the way in which it is planned to be implemented, that is, how this program fits into the existing system of administrative management. According to studies, various environmental organizations are engaged in monitoring the ecological state of the city territory. They develop and implement measures aimed at preventing and eliminating undesirable phenomena. However, these measures are of a private nature and are focused on individual components of the urban environment. If we consider the urban system as an object of environmental monitoring, then probably the most effective solution to the problems related to it can be carried out by the authorities, which manage this urban system as a whole. They are the ones who can organize effective environmental monitoring. But at the same time, it should be emphasized that this does not imply the elimination of other structures. Organization in this case means, first of all, coordination of efforts of all structures and

comprehensive analysis of received information based on good knowledge of local conditions [13].

4. Socio-ecological monitoring of urban systems can be carried out when its program has a legal basis, and the planned measures do not contradict the norms of the current legislation. The real organization of monitoring involves the legal justification of the activity of a specific structure that will carry it out. 5. The environmental monitoring program must be based on a unified methodology. Only in this case, the results of the study of individual objects (urbanized areas) can be used to determine general patterns and develop scientifically based measures. Academician A.L. Kalabekov offers a unified method of environmental monitoring suitable for use in any city. He points out that modern studies of the state of natural ecosystems are based on the unity of their structural and functional organization [1]. However, the mechanical transfer of this methodology to the study of the urban area does not give satisfactory results. This is related to the specificity of the urban environment, the factors of its formation and structure differ from the natural one. Unlike the natural environment, social factors have always prevailed in the city, its conditions are largely created by the activities of one species - man. At the same time, it is quite possible to use a systematic approach in monitoring the urban environment, taking into account its specific features. Urbosystems are a type of natural-anthropogenic systems. Their condition is determined by a complex system of interaction of anthropogenic and natural factors affecting both structural and functional characteristics. Therefore, ecological monitoring of urban systems and the development of methods for their effective management should be based on the study of structural and functional organization, but not ecosystems, but urban systems.

Because there is no generally accepted opinion about the structure of urban systems at this time, urban building complexes, the spaces between them, and transport communications are considered as the main elements of the structure of urban systems [10]. However, despite the obvious reality of the existence of these structures, it is impractical to conduct environmental monitoring according to this principle. The results of such studies characterize only the distribution of pollutants in the "external" urban environment and changes in individual components (vegetation, fauna, etc.) due to anthropogenic load [14, 15]. The main element of the urban system - a person - does not fit well into the program of such monitoring. Unlike other organisms of urban systems, people do not live in specific urban biotopes: on the surface of buildings, between buildings, on the sides of transport communications, etc. The human habitat has a different character. People "consume the environment very selectively" [1]. That is, each person has his own habitat, the so-called "area of activity". There are not only individual, but also group areas of activity, which are a set of places visited during, for example, a week's life cycle. In this regard, the other side of the organization of the urban system - the functional one – deserves special attention. Its basis is the administrative management of the city. According to the analysis of literary data, a person is mostly a resident of a specific district. Residents living in the territory of one district can be considered as a single object (compare data characterizing the health of the population of individual districts). Environmental monitoring based on the administrative structure of the city provides a number of fundamental advantages. First, it allows to include in the procedure of environmental monitoring the results of socio-hygienic monitoring, which is carried out according to the administrative-territorial principle. Secondly, the real effectiveness of socio-ecological monitoring can be achieved when

its organizational and methodological principles are based on current legislation. Aligning the monitoring structure with the city management structure makes this process much easier. At the same time, the organization of environmental monitoring only on the basis of an administrative structure represents another extreme. To obtain adequate information about the state of the environment, it is necessary to study all the main elements of the urban system - atmospheric air, soil, etc. It is obvious that the zoning of the territory and the selection of sampling points should be carried out taking into account the urban topography and other factors not directly related to the management system.

Conclusions. According to the territorial principle, the following types of monitoring are differentiated - local (medical-biological, social-ecological), regional (geosystemic, agroecological) and global (biosphere, background). The program of socio-ecological monitoring, which is carried out at the local level, includes observations of changes in the content of pollutants with carcinogenic, mutagenic and other adverse effects.

In order to establish the ecological state of the territory, the content of hazardous environmental pollutants is determined:

- carbon oxides, sulfur dioxide, ozone, dust, heavy metals and radionuclides, aerosols, nitrogen, phosphorus, benz(a)pyrene, hydrocarbons (atmospheric air);
- radionuclides, heavy metals, pesticides, petroleum products, benz(a)pyrene, phosphorus, phenol, nitrogen, the level of mineralization and pH (surface water);
- heavy metals, radionuclides, benz(a)pyrene, pesticides, nitrogen, phosphorus (biota).

The level of radiation, noise, vibration, electromagnetic radiation and other harmful physical factors is also determined in the process of conducting monitoring studies of urban systems.

2. The main tasks of the urban system monitoring organization have their own characteristics. In this regard, three methodological aspects of creating effective monitoring that ensure safety and improvement of environmental conditions in cities can be distinguished:

- the object of organization and monitoring is the urban system with all man-made processes that have a negative impact on the environment;

- the main condition for urban system monitoring is city management;

- all the main components of the urban system are considered as a single structural and functional formation. The information base and monitoring of urban systems should be aimed at ensuring the three main subjects of city management and law: city authorities - citizens - professionals.

3. The application of the system of social and environmental monitoring contributes to the environmental safety of the population. In the process of its implementation, methods of controlling environmental mutagens, development and implementation of antimutagens (in harmful industries, in emergency situations during the liquidation of accidents), methods of controlling ecological and genetic factors (food and medical products), implementation of a demographic policy, medical and genetic consultations, including prenatal diagnosis of hereditary defects, etc.

4. In the process of socio-ecological monitoring of urban systems, the main indicators are the health status of city residents. With a systematic approach to the study of processes in the urban system, sanitary and hygienic indicators should be included in a single system for assessing the state of the urban environment. After all, in urban systems, a person is the main test object, and the state of health of city residents is an integral indicator of the comfort of environmental conditions.

References:

1. Йоркіна Н. В. Екотоксикологічна та біоіндикаційна оцінка стану урбосистеми міста Мелітополь : автореф. дис. канд. біол. наук : 03.00.16 / Йоркіна Надія Володимирівна; Державна екологічна академія післядипломної освіти та управління. Київ, 2017. 20 с.

2. Goddard M.A., Dougill A.J., Benton T.G. Scaling up from gardens: biodiversity conservation in urban environments. Trends Ecol Evol, 2010. 25:90–8.

3. Grimm N.B., Grove J.G., Pickett S., Redman C.L. Integrated Approaches to Long-Term Studies of Urban Ecological Systems / BioScience, Volume 50, Issue 7, 2000. P. 571–584, https://doi.org/10.1641/0006-3568(2000)050[0571:IATLTO]2.0.CO;2.

4. Johnson M., Munshi-South J. Evolution of life in urban environments, 2017. Science, 358 (6363): eaam8327; DOI: 10.1126/science.aam8327.

5. Ouyang J.Q, Isaksson C., Schmidt C., Hutton P., Bonier F., Dominoni D.. A New Framework for Urban Ecology: An Integration of Proximate and Ultimate Responses to Anthropogenic Change / Integr Comp Biol., 58(5), 2018. P. 915–928. doi: 10.1093/icb/icy110.

6. While A., Whitehead M. Cities, urbanisation and climate change. Urban Stud, 50:13. 2013. P. 25–31.

7. Wong B., Candolin U. Behavioral responses to changing environments. Behav. Ecol., 26, 2015. P. 665–73.

8. Yorkina N., Cherniak Ye. Ecological-coenotic analysis of phytocommunities of antropogenically transformed territories / C91 Moderní aspekty vědy: XIII. Díl mezinárodní kolektivní monografie / Mezinárodní Ekonomický Institut s.r.o.. Česká republika: Mezinárodní Ekonomický Institut s.r.o., 2021. str. 368-390.

9. Yorkina N., Cherniak Ye. Educational aspects of the organization of ecological tourism in the Zaporizhia region / C91 Moderní aspekty vědy: XXXI. Díl mezinárodní kolektivní monografie / Mezinárodní Ekonomický Institut s.r.o. Česká republika: Mezinárodní Ekonomický Institut s.r.o., 2023. str. 316-336.

10. Yorkina N., Cherniak Ye. Environmental problems of Ukrainian cities (on the example of Melitopol) / The IX International Science Conference Innovative technologies in science and education. Jerusalem, 2021. P. 43-46. DOI - 10.46299/ISG.2021.I.IX.

11. Yorkina, N. Impact of technogenic pollution of urban environment on indicators of vitality of urban biota (mollusk fauna, soil mesofauna, epiphytic lichens). University Biological Sciences Bulletin. Seriya 16. Biologiya. 3, 2016. 73-80.

12. Yorkina N., Cherniak Ye. Medical and biological monitoring as an important condition for genetic safety of the population / The V International Science Conference Theoretical and scientific bases of development of scientific thought. Rome, 2021. P. 70-72. DOI - 10.46299/ISG.2021.I.V.

13. Yorkina N., Cherniak Ye. Regional and socio-ethical aspects of ecological monitoring of aerotechnogenic pollution of the city of Melitopol / The VII International Science Conference Modern trends in development science and practice, 2021. Varna. P. 61-63. DOI : 10.46299/ISG.2021.II.VII.

14. Yorkina N., Cherniak Ye. Solid household waste in the city of Melitopol: current situation and problems // C91 Moderní aspekty vědy: XIV. Díl mezinárodní kolektivní monografie / Mezinárodní Ekonomický Institut s.r.o.. Česká republika: Mezinárodní Ekonomický Institut s.r.o., 2021. S. 783-800.

15. Yorkina, N., Zhukov, O., Chromysheva, O. Potential possibilities of soil mesofauna usage of soil contamination by heavy metals. *Ekológia (Bratislava)*. 38. 1, 2019. DOI:10.2478/eko-2019-0001.