

ENVIRONMENTAL MONITORING OF THE ENVIRONMENT AND EMERGENCY

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ABSTRACT

The threat to the ecological balance, which can turn into a global problem, and its observed deviations arise as a consequence of the complex relationship between the natural and satsal environments.

Key words: safety, environmental protection, environmental monitoring, emergency.

INTRODUCTION

Direct or indirect human impact on the ecological system of the Earth, formed in the aggregate and interdependence of the planet's ecosystem, entails changes in its social environment. With a serious threat of the spread of both known dangerous and especially dangerous infectious diseases, as well as “nontraditional” ones, for example, bird flu, swine fever, and coronavirus. We do not exclude the fact that one of the reasons for the mutation of the avian influenza H5N1 virus, the coronavirus COVID-19 and the expansion of the range of birds and animals susceptible to them were paradoxal changes of this agent in natural conditions as one of the consequences of the impact of anthropogenic factors on the environment. The characteristics of environmental situations in which emergencies are possible in the social environment are reflected in Table 1.

Environmental regulatory documents in terms of environmental protection in emergency situations (hereinafter referred to as emergency situations) include a number of laws of the Republic of Uzbekistan, namely: dated 09.12.1992, No. 754-XII "On nature protection", dated 27.12.199 No. 353-1 "On the protection of atmospheric air", dated 05.04.2002, No. 362-II "On waste", dated 03.12.2004, No. 710-11 "On protected natural areas", dated 25.05.2000 No. 73-11- “On ecological expertise”.

Climate change is one of the most important international problems of the 21st century and is a complex interdisciplinary problem covering the environmental, economic and social aspects of sustainable development in the Republic of Uzbekistan [1,2].

Table 1. Characteristics of ecological situations.

Environmental situations	Area characteristics
Natural state	Weakly polluted by anthropogenic activities with preserved traditional way of economy and protected natural areas
Conflicting	With a stable socio-economic development of technogenic rearrangements of landscapes, with a slow change in structure that does not affect the natural environment
Crisis	Anthropogenic disturbances exceed natural restoration processes in the environment.
Disastrous	Intensively developed areas, with the threat of epidemics, destruction of the natural basis and self-regulation mechanisms

The Republic of Uzbekistan includes a number of laws on the national security of citizens, namely: from 26.05.2000, No. 80-II "On civil protection" from 20.08.1999, No. 824-1. "On the protection of the population and territories from natural and man-made emergencies", On May 1, 2020, at 05:55 am local time, the sixth dam of the Sardoba reservoir broke through in the Syrdarya region of Uzbekistan due to heavy rain and storm winds. Water flooded 6 nearby villages in three districts of the region. 90 thousand local residents were evacuated. 4 people were killed, 1 was missing. Large and small ruminants died.

The EMERCOM of the Republic of Uzbekistan called the preliminary damage to infrastructure due to the breakthrough of the dam of the Sardobin reservoir. 8 kindergartens, 16 schools, 7 medical institutions, 1 college, 7 cemeteries, 3 mosques, 13 bridges of republican importance, 52 km of roads and 1 dekhkan market were damaged. Partial damages were caused to 99 residential buildings [7].

Table 2. The main characteristics of the reservoir Uzbekistan.

№	Reservoir name	Commissioning year	Full volume, mln.m ³	Useful volume, million m ³	Reservoir parameters			Dam type		
					Length (km)	Width (km)	Max depth (m)	Dam type	Height (m)	Length (m)
1	Aktepa	1978	120	100	3	2	18	Earthen	14	20
2	Akdarya	1989	113	110	8,5	2,4	23,4	Earthen	20	930
3	Andijan	1970	1900	1750	20	6	98	Concrete, buttress	121	850
4	Akhangaran	1989	195	185	6	1,1	63	Earthen	100	1933
5	Gissarak	1990	170	162	6,8	0,6	130	Stone earthen	139	660
6	Jizzakh	1973	100	96	3,3	3,6	24	Earthen	20	5500
7	Zaaminskoye	1987	51	30	3,2	0,8	73	Earthen with screen	74	408
8	Kamashinskoe	1987	25	24	3,1	1,6	15	Bulk ground	15	3100
9	Kattakurgan	1968	900	840	17	5	26,3	Earthen bulk	31,2	4040
10	Karultepa	1983	53	50	2	4,7	43	Earthen	51	265
11	Karkidonskoe	1967	218	211	5	5,5	66	Earthen	70,3	420,2
12	Kasansai	1968	165	155	5,2	3,5	63	Stone-filled	64	290
13	Kuyumazarskoe	1960	310	263	5,3	3,3	22,8	Earthen	23,5	100
14	Pachkamarskoe	1968	260	250	5,5	2,2	34	Earthen	71	573
15	Talimarzhanskoe	1985	1525	1400	14	7	40	Earthen	35	9745
16	Tudakul	1979	1200	600	15	14	11,7	Earthen	12	4000
17	Tupalang	1990	500	470	25	0,4	164	Stone-filled	180	410
18	Tuyamuyun	1979	7800	5270	-	-	-	Earthen	34	900
19	Tuyabuguz (Tashkent Sea)	1963	250	224	9	4	32	Earthen	36,5	2815
20	Uchkyzyl	1957	160	80	5,5	3,5	40	Earthen	11,5	1750
21	Charvak	1978	2006	1580	22	1,8	148	Stone earthen	168	764
22	Chartak	1989	30	21,1	4	1,2	43	Earthen	45	1594
23	Chimkurgan	1963	500	450	175,5	6,8	30	Earthen	33	7700
24	Shurkul	1984	170	153	8	5,3	36	Earthen	14,5	560
25	South-Surkhan	1967	800	700	20	5,2	27	Earthen	30	4930

In 1999, the Law of the Republic of Uzbekistan "On the safety of hydraulic structures" was put into effect.

The main goal of the introduction of the Law is to ensure the protection of the life, health and property of citizens, as well as the property of enterprises, to prevent the destruction of buildings and structures, soil erosion, dangerous changes in the level of groundwater and other damage as a result of accidents at hydraulic structures. Therefore, the Law applies to all hydraulic structures, accidents of which can create emergency situations, accompanied by a threat to the life and health of people, violation of the conditions of their work and life.

Table 2 shows that the platinum reservoir of Uzbekistan consists of earthen, concrete buttress, stone-earth, earth-fill, and rock-fill. Therefore, constant environmental monitoring and control of the condition of platinum, often consisting of reinforced concrete, is necessary.

Monitoring the safety of hydraulic structures implies an effective operational control technology based not only on a system of safety assessment criteria, but also on the promptness and completeness of access to all accumulated information about structures. Therefore, the organization of monitoring of their safe state is of particular relevance.

Along with natural emergencies, problems in terms of technospheric safety are also relevant for social society. On the territory of the Republic of Uzbekistan, solid household waste is generated annually.

According to the law of 05.04.2002, No. 362-11 "On Waste", it is prohibited to store and neutralize waste on the lands of settlements, environmental, health-improving, recreational purposes and lands occupied by objects of material cultural heritage, in other places where threat to the life and health of citizens, as well as damage to nature conservation objects and protected natural areas. It is necessary to monitor the state of collection, transportation, processing and disposal of household waste.

At chemical plants, as well as factories of building materials of the country's enterprises, pollutants are emitted, of which 1-2 million tons are released into the atmospheric air without purification. Surface water bodies receive 5-6 km³ of wastewater, of which 37% is contaminated, 60% is normatively clean, and only 4% is normatively treated wastewater.

Sustainable development of industry is impossible without creating a system that monitors the safe operation of hazardous facilities, especially biotechnology facilities, and the state of the environment in the areas where they are located. This system is called the environmental monitoring system and ensures the accumulation, systematization and analysis of information: about the state of the environment; the reasons for the observed and probable changes in its state (i.e. about the sources and facts of impact on the environment); admissibility of changes and loads on the components of the natural environment; existing reserves of the biosphere.

Ecological monitoring is carried out in order to monitor the state of the environment, including in areas where sources of anthropogenic impact are located; assessment and forecast of changes in the state of the environment and its changes, necessary to prevent and (or) reduce the adverse consequences of these changes.

When organizing environmental monitoring, particular attention is paid to biological methods. In essence, monitoring is a high-tech, in modern terminology - an intelligent system that allows optimization and allows, with a minimum of attracted funds, to produce the most complete and reliable information about the state of the environment [4].

The Republic of Uzbekistan since 1992. Provides for the organization of a unified system of state environmental monitoring (state environmental monitoring) for all natural resources and environmental components with the current laws: "On nature protection" Art. 28, 29, 30, "On the protection of atmospheric air" Art. 27, "On water and water use" Art.99.

In turn, subjects of economic and other activities are obliged to carry out industrial environmental control, as well as monitoring the state of individual components of the environment in the zone of influence of their facilities, this is determined by environmental and sanitary regulatory documents (SanPiN RUz No. 0293-11, SanPiN RUz 2.1. 4.1175-02, SanPiN RUz No. 0056-96). That, unfortunately, is not always executed, then with great violations, to the detriment of nature and human health.

Therefore, in order to prevent and eliminate emergencies associated with the interdependence of nature and the social environment, environmental services of Uzbekistan need to conduct environmental monitoring to assess the impact of the environment on the

sustainable development of social society, and the impact of social society on the environment, as well as risks and damages, due to development of observation, warning and warning systems.

To the main tasks of environmental monitoring, and hence the security of facilities, especially biotechnological facilities [3], and therefore prevention of the introduction and spread of pathogens of dangerous infectious diseases into the country, it is necessary to use highly sensitive diagnostic test systems. For example, a mobile set of biological control "BIOCON", intended for carrying out in the field of work on the detection and identification of biological agents by the method of polymer chain reaction (hereinafter referred to as PCR). Where possible, through reverse transcription and polymer chain reaction (hereinafter referred to as RT-PCR), the identification of nucleic acids of biological agents from samples of biomaterials and the environment and the issuance of a conclusion on the presence of pathogenic pathogens in the analyzed sample in the shortest possible time (8).

We believe that for an effective and practical solution to the identified problems, it is necessary to determine the activities of environmental monitoring of the environment as a fundamental factor in the prevention of emergencies, into an independent subsystem.

For an effective and high-quality solution of problems of preventing emergencies of a natural or man-made nature, as well as for carrying out emergency rescue operations in the emergency zone, there is an objective need to use programs of control means, which should be combined into a single automated system, taking into account the responsibility of the management bodies for the implementation of measures to prevent and elimination of emergencies at various levels of the territorial division of the disaster zone and providing an opportunity to choose a rational solution to the organization and technology of rescue operations at all stages of their implementation, taking into account the characteristics of the current situation, even if the problems are complex [5].

In order to improve and increase the efficiency of the environmental monitoring system and prevent negative impacts by predicting its occurrence, as well as systematic monitoring of the use of natural resources, assessment, information support for state control in the field of environmental protection, targeted and rational use of natural resources there is a resolution

of the Cabinet of Ministers of Uzbekistan dated 05.09.2019, No. 737 "On improving the environmental monitoring system in Uzbekistan."

We believe that environmental monitoring by environmental services of Uzbekistan will allow from 5 to 11% not only to reduce the number of victims, but also from 4 to 14% to reduce economic damage. And also at the same time to ensure constant control of economic and environmental activities in Uzbekistan.

Thus, in order to conduct environmental monitoring of the environment as a fundamental factor in the prevention of natural and man-made emergencies, it is necessary to take into account modern methods of environmental control, as well as training and their specialization for its implementation.

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