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"Challenges and Innovative Solutions of Life Safety in Ensuring Sustainability in Economic Sectors"

Problems of Monitoring and Prediction of Possible Emergency Situations on the Territory of Uzbekistan and the Ways of their Solution

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Abstract: *The purpose of the scientific research is to protect the population and territories of the Andijan region through the implementation of preventive measures to prevent emergencies of a natural and man – made emergencies.*

The task of the work is to develop specific, scientifically based recommendations for further improvement of the system for monitoring and forecasting emergency situations.

Keywords: *Emergency, monitoring, forecast, mudflow, tailings.*

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Introduction

It is known that the level of sustainable development of the economy of any country depends on the nature and scale of man-made and natural disasters in the country.

Earthquakes, landslides, floods, landslides, floods, releases of highly toxic substances, epidemics, epizootics and other emergencies occur on the territory of our republic, and there are all conditions for this. In the occurrence of any natural and man-made disaster, a system of factors occupies a special place.

Therefore, monitoring is of particular importance in order to prevent possible emergencies and minimize the loss of human and material resources in case of their occurrence, that is, forecast data are prepared in advance in order to organize targeted preventive measures.

Methods and materials: In this study, a possible ecological situation is predicted in the area around the tailings and dumps formed during mining, in special storage facilities near the Mayli-Suu River and its tributaries, and settlements located around the river.

The studies were carried out in accordance with the regulatory legal documents in force on the territory of the republic [1,2].

In addition, the tasks (functions) of ministries and departments and other organizations for monitoring and forecasting emergency situations are defined [2].

In the republic, the management of a unified system for monitoring and forecasting emergency situations of a natural, man-made and environmental nature, and the exchange of information is entrusted to the Ministry of Emergency Situations of the Republic of Uzbekistan.

However, there are serious shortcomings in the organization of monitoring and forecasting natural, man-made and environmental emergencies that may arise in our region. In particular, natural and man-made emergencies that have occurred in the country over the past two years (mudflow in the Andijan region, a dam break in the Sardoba reservoir, etc.) and their consequences convincingly indicate the need for further improvement of this system.

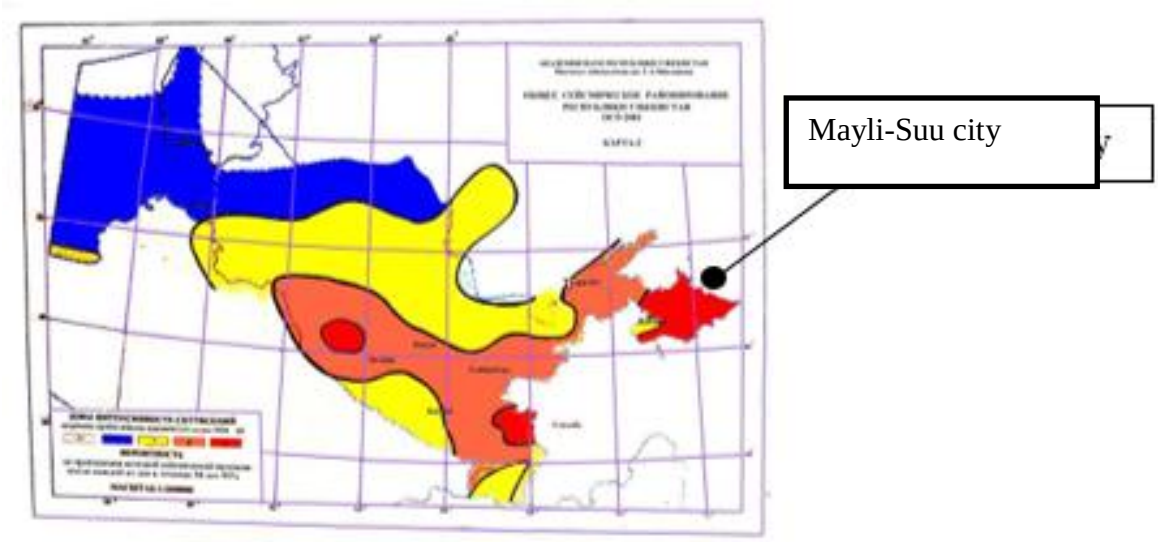
In addition, we are wary of the situation along the banks of the Mayli-Suu River, which originates in the neighboring Kyrgyz Republic and flows through the Pakhtaabad district of the Andijan region. In the Kyrgyz Republic, there are 23 radioactive waste burial sites (tailings) and 13 radioactive waste dumps (dumps) along the banks of the Mayli-Suu River.

From the side of the neighboring state, systematic work on the reclamation of these objects has not yet been carried out [3].

In recent years, for the construction of the city of Mayli-Suu, mountain slopes were cut down on this site and a number of construction works were carried out. These works have created all the conditions for strengthening the landslide situation in the region.

As a result of research conducted by the exploration expedition of the former Central AsianResearch and Design Institute of Industrial Technologies,It has been established that there is a real threat of landslides that can destroy 8 (No. 3, No. 5, No. 7, No. 8, No. 9, No. 10, No. 11, No. 18) radioactive waste burial sites located directly on the banks of the Mayli-Suu River.As a result, the channel will be blocked by earthen mass with a total volume of 1 million 150 thousand cubic meters. As a result, an artificial reservoir is formed, contaminated with radioactive substances, with a total volume of 2.4 million cubic meters.

If we take into account the fact that our region is located in a seismically hazardous area, then the likelihood of landslides still increases (picture 1).



Picture 1. Seismic map of Uzbekistan.

A similar situation occurred on April 13, 2005 in the area of the Izolit plant, which is located on the left bank of the Mayli-Suu River. Then a landslide with a total volume of 230-300 thousand cubic meters blocked the riverbed.

Over the years of observation, 217 landslides of various sizes were recorded around the river. According to the Kalym Shamy Foundation of the Kyrgyz Republic, more than 1,495 thousand cubic meters of radioactive waste have accumulated on the banks of the Mayli-Suu River.

The maximum throughput of the Mayli-Suu River is 150 cubic meters per second (150x3600 = 540,000 cubic meters per hour, 540,000x24 = 12 million 960 thousand cubic meters per day).

According to the analysis of long-term observations of the Andijan Regional Department of Hydrometeorology and the Department of Basins of Irrigation Systems "Naryn-Karadarya", the water level in the Mayli-Suu River rises in April-May (an average of 70 cubic meters per second).

The radioactive waste dumps are located 45 km from the Andijan region, on the banks of the Mayli-Suu River.

If we take the speed of the Mayli-Suu River equal to 1.5 meters per second, the water contaminated with radioactive substances from the source of contamination will reach the Uzbek border (village"Madaniyat" Pakhtaabad district of Andijan region) within 8.5 hours.

As a result, the radiation background in the river bed and its banks (at a distance of 1.0-1.5 km) can exceed the maximum allowable values by 10-15 times (up to 400 microroentgen / hour), and in some sections of the river, i.e. . at the foot of hydraulic structures that trap flowing gravel and slow down the flow of water by 30-35 times (up to 1000 mc / hour).

This, in turn, will require the relocation of the population (up to 6,000 people) living in the Pakhtaabad region, located 1.0-1.5 km from the river bank.

As a result of natural evaporation of water, formed by collecting water from Mayli-Suu in the spring-summer season of the year (April-August), a permanent radiation cloud is formed at a height of 10 meters above the artificial reservoirs that are located around the river.

Considering that the southwest and west wind prevails in the Andijan region, these clouds may adversely affect the population of two nearby settlements (a total of 3,200 people).

In addition, inThere are 9 glaciers with a total area of 3.2 km² in the upper reaches of the Mayli-Suu River at an altitude of more than 4000 meters [4, pp. 126-128].With a sudden increase in air temperature, these glaciers can cause mudflows (as a result of intensive melting of glaciers, a similar incident occurred on July 8, 1998 in the village of Shakhimardan, Fergana region).

Results and discussion: Based on the forecast and analysis of the possible environmental situation in hazardous areas, specific proposals have been developed to prevent and mitigate the consequences of a possible transboundary emergency in the region. In practice, there are all opportunities to implement the results of scientific research.

Conclusions and recommendations: Based on the above and a comprehensive study of scientific research in this area [5,6,7,8] and in order to improve the monitoring of emergency situations and increase the efficiency of forecasting these phenomena, the following is recommended:

1. In order to prevent transboundary emergencies, fundamentally reconsider the issues of interaction with the relevant state bodies of neighboring states on organizing monitoring of the hydrological regime of reservoirs, rivers and canals, floods, catastrophic floods, the impact of natural conditions on hydraulic structures, studying the condition of mudflow protection structures and their repair.

   Particularly intensify efforts to attract the attention of the international community (for example,United Nations Development Program, International Red Cross and Red Crescent Movementand others) to improve the system for monitoring the situation on the banks of the Mayli-Suu River.

2. Taking into account that the Kyrgyz Republic is located in a seismically active zone, strictly control the process of construction and commissioning of new buildings and structures and accelerate work on seismic strengthening of existing structures. Submit proposals to the governments of the Kyrgyz Republic and the Republic of Uzbekistan to strengthen the material and technical base of seismic stations. equipping them with modern equipment;

3. Pay special attention to scientific research to develop new, improve existing theoretical and practical methods for assessing various hazardous processes at the regional and local levels,

review the issues of interaction between research institutions and higher educational institutions of the countries of the Central Asian region;

4. Wide use of modern technical means and computer technologies in monitoring and forecasting emergency situations (for example, the use of drones in monitoring);
5. Monitoring and forecasting of emergency situations, studying existing problems and bringing them to the management in an understandable form requires deep knowledge and skills from the staff.

   Therefore, in addition to special requirements for applicants for these positions, they must have sufficient practical experience in this area (for example, pensioners in this area) or have a special education (for example, graduates of higher educational institutions in this specialty). Also to review the system of training and retraining of specialists in this field;
6. Strengthening measures to influence leaders of different levels and other organizations for improper performance of functional duties for monitoring and forecasting emergencies and for timely provision of information to the Ministry of Emergency Situations of the Republic of information about possible emergencies at their facilities and territories.

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