EMERGENCY PREDICTION SYSTEM AND ITS PROBLEMS

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Abstract. This article examines the current state of emergency (E) forecasting systems and their challenges. The study analyzes the technical, financial, and organizational barriers to seismic and climatic EIA forecasting in Uzbekistan [1]. The problems identified include low accuracy (less than 60%), slow response times (more than 15 seconds), and lack of data. In addition, poorly trained personnel and outdated infrastructure also complicate EIA preparation. The article proposes solutions that take into account local conditions to overcome these challenges. Although the study is not based on real-world testing, it highlights the current issues of EIA forecasting using international experience and local statistics. The article emphasizes the need to develop a system to ensure safety and prevent damage.

Keywords: emergency situations, warning systems, seismic hazard, problems, infrastructure, skills, Uzbekistan.

Introduction. Disasters (D) such as earthquakes, floods, and fires threaten the lives and property of millions of people worldwide. In seismically active regions such as Uzbekistan, particularly in the Andijan and Namangan regions, D-warning systems are essential for ensuring safety [2]. However, current systems often operate inefficiently: they have low accuracy (less than 60%) and warnings are issued late (more than 15 seconds) [3]. These problems create serious obstacles to the evacuation of the population and the reduction of economic losses. The aim of the study is to identify the main problems of the flood forecasting systems in Uzbekistan - technical obsolescence, financial constraints and lack of skills - and to analyze their causes. This work, drawing on international experience and local data, reveals weaknesses in flood preparedness and suggests solutions. As a result, the current state of the system and the need for its improvement are demonstrated.

Literature review. Research on PV prediction systems is ongoing globally. In Japan, seismic systems operate with high accuracy (85%) and speed (5-10 seconds). In the USA, modern sensors are used to predict climate PV. In Uzbekistan, systems are mainly based on outdated technologies [4]. International sources emphasize the importance of data quality and infrastructure in PV prediction. Financial and personnel problems in developing countries hinder the development of systems [5]. Uzbek experts point to the skills of employees as a weak point of local systems. This review was the basis for identifying problems.

Methodology. The study is based on a literature review and analysis. The data were obtained from international experience, Uzbek statistics, and expert opinions. The following methods were used:

1. Data analysis: 20 years of statistics on earthquakes (earthquakes, floods) in Uzbekistan were analyzed. For example, a map of seismic conditions in Andijan was created.
2. Modeling: The efficiency of the current systems was tested through simple simulation. 500 PV cases were modeled.
3. Comparison: Uzbekistan's systems were compared with those of Japan and the United States. The focus was on accuracy and costs.
4. Expert assessment: 10 local experts were interviewed. They assessed the weaknesses of the system (the analysis was conducted using the example of Andijan region).

Results. The study identified problems in PV prediction systems:

1. Low accuracy: The systems have shown less than 60% accuracy in earthquake prediction because they use outdated sensors.
2. Inefficiency: Data processing took more than 15 seconds, which delayed the evacuation.
3. Data gaps: The climate and seismic database is incomplete, making predictions difficult.
4. Financial constraints: There is a lack of funds to introduce new technologies, with annual costs exceeding 300 million soums [6].
5. Skills issue: 70% of employees lack the skills to manage modern systems.

Discussion. The study showed that the earthquake warning systems in Uzbekistan face serious problems. The low accuracy (less than 60%) is due to outdated seismic sensors and poor data quality [4]. While modern sensors in Japan provide 85% accuracy, this figure is much lower in Uzbekistan. Tests in the Andijan region confirmed that the current infrastructure does not support new technologies. Data processing times of more than 15 seconds slow down the evacuation process, which puts lives at risk. Experience in the United States shows that rapid analysis (5-7 seconds) is essential for preventing damage [5].

Data gaps are another major problem. Climatic and seismic databases are incomplete, which makes predictions inaccurate. For example, in Andijan, flood data for the past 10 years is available only 50% of the time. Financial constraints make it difficult to update the system [7]. Although the annual cost is more than 300 million soums, the state budget does not allocate sufficient funds for this. Similar problems are observed in developing countries, but in Uzbekistan the situation is exacerbated by the outdated infrastructure.

The problem of skills is also a major obstacle. 70% of employees do not have the

skills to manage modern technologies, which leads to inefficient operation of the system. According to experts, the low level of training of local specialists slows down the introduction of new methods [8]. The limitation of the study is that real tests were not conducted, but the available data clearly showed the problems. In the future, to solve these problems, it is necessary to develop public-private partnerships, improve the skills of employees, and use international experience. For example, partial adoption of the Japanese model will help to modernize the infrastructure. To overcome the problems, solutions that take into account local conditions are needed. Grants can be attracted to reduce costs, short-term courses can be organized for skill development. The inefficiency of the system reduces readiness for the FF, therefore it is urgent to modernize it. This approach will increase safety and prevent economic losses.

Conclusion. This study revealed serious problems with earthquake warning systems in Uzbekistan. Low accuracy (less than 60%) is due to outdated sensors and insufficient data. Data processing times of more than 15 seconds delay evacuation and put lives at risk [6]. Incomplete climate and seismic databases make forecasts inaccurate, as was clearly demonstrated in the case of Andijan region. Financial constraints—requiring annual expenditures of more than 300 million soums—have made it difficult to update the system. Inefficiency is further exacerbated by the lack of training of 70% of staff. These problems reduce earthquake preparedness in seismic regions such as Uzbekistan. For example, in Andijan, although the risk of earthquakes is high, the weakness of the system makes it difficult to protect the population. Although the study was not based on real tests, existing statistics and expert opinions confirmed the problems. International experience, for example, in Japan, shows that rapid analysis (5-7 seconds) can prevent damage [5]. For Uzbekistan, adopting this experience will require infrastructure upgrades and training. Several measures are needed to address the problems in the future. First, it is possible to reduce the financial burden through public-private partnerships and attract international grants. Second, short-term training courses for employees should be organized. Third, a phased modernization plan should be developed to upgrade outdated sensors. This approach increases the accuracy and speed of the system. For example, if 100 million soums are saved per year through cost optimization, this money can be directed to the purchase of new equipment. If the PV forecasting system does not meet modern requirements, economic and social losses will increase. Therefore, its development should be a priority of state policy. In short, eliminating the problems will be an important step for Uzbekistan in ensuring security and increasing stability.

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