

INPUT PAPER

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SYSTEMS OF EARLY WARNING OF THE MAIN NATURE DISASTERS WITH PUBLIC NOTIFICATION IN UZBEKISTAN

V.E.Chub
Uzhydromet

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The nature impacts the economical human activities in two ways: from one part, elemental ecological and hydrometeorological disasters cause substantial damage to the national economy but from the other one – the reliable information about nature and climate forms the additional resource of the economical effectiveness. This means that the losses and damage caused by the negative weather phenomena to enterprises can be minimized as well as the benefit can be maximized due to the rational use of beneficial nature factors.

The proper use of information about climate and weather in all sectors of economy provides for the stability of economy regarding all disasters. Legal entities should clearly understand the range of degree of influence of weather phenomena to the productive activities and develop the relevant "meteorological-and-economical model" of preventive measures.

The tasks of Uzhydromet are the permanent watching of all changes in nature, the forecast of possibility of unfavourable weather conditions, of their development and timely warning of production workers about their occurrence. The high coordination between these sectors provides for minimum damage caused by the disaster.

Uzhydromet issues daily analytical and forecasting materials the proper use of which ensures the substantial economical effect for the climate prone sectors of national economy. The weather forecasts and warnings about the occurrence of disasters are especially important.

Medium-range forecasts are issued daily 1-5 days in advance for provinces. Every month the consultative forecasts are produced for one month period. The analysis of the impact of hydrometeorological conditions on the activities of the main sectors of economy is under preparation.

The systems of the early warning for the main types of disastrous hydrometeorological phenomena are implemented by several responsible agencies.

Uzhydromet carries out the monitoring of nature disasters using all up-to-date types of observations – satellite information, surface monitoring and keeping the information system on dangerous hydrometeorological phenomena.

With the possibility of risk of hydrometeorological danger Uzhydromet forwards the relevant warnings to the Ministry of emergency situations and other government bodies responsible for decision making.

Ministry of emergency situations is responsible for the distribution of warnings for population and taking measures for reduction of disasters and liquidation of aftereffects of the possible catastrophes.

Besides, the relevant ministries get the warnings depending on character of manifestation of dangerous hydrometeorological disaster. For example, the agencies of the public service receive the warnings about possible storm phenomena which can cause damage to the transport and other communications in populated areas (heavy snowfall, heavy rains).

When the risk of drought and low water occurs, the warnings are forwarded to the Ministry of agriculture and water economy which enables to take necessary measures directed to elimination of consequences of drought and low water in agricultural sector.

In the period of mudflow or avalanche activity the warnings are forwarded to all government bodies responsible for operation and maintenance of the road communications and recreation service.

One of the main activities in the process of the warnings distribution is mass media including dissemination of messages to the mobile communication operators with the subsequent dissemination of SMS-messages with the relevant recommendations – in the conditions of possible heat waves, during avalanche and mudflow danger.

With the definite possibility of dangerous hydrometeorological phenomena the storm warnings about dangerous and extremely dangerous phenomena, warnings of avalanche threat and mudflows passing (Image 1) are issued.

In particular, the warnings on the avalanche threat and mudflow passing are issued on the base of monitoring which is realized in accordance with the enactment of the President of Republic of Uzbekistan «On the measures for the prevention of emergency situations related to the flood, mudflow, snow avalanche and landslide phenomena and elimination of their consequences». It depicts the tasks of the involved ministries and agencies on organization of monitoring of the nature and anthropogenic phenomena and elimination of their consequences (Image 2).

Besides, the warnings about sudden temperature decrease and weather changes, frosts, heavy precipitation, thunderstorms and wind, long-lasting snowstorms, about dangerous surges and onsets of the lake and marine water, about high water level, about the extreme time of the ice phenomena beginning, warnings about the occurrence and duration of meteorological conditions which are unfavourable for the dispersion of harmful admixtures in atmosphere are disseminated via special alert schemes.

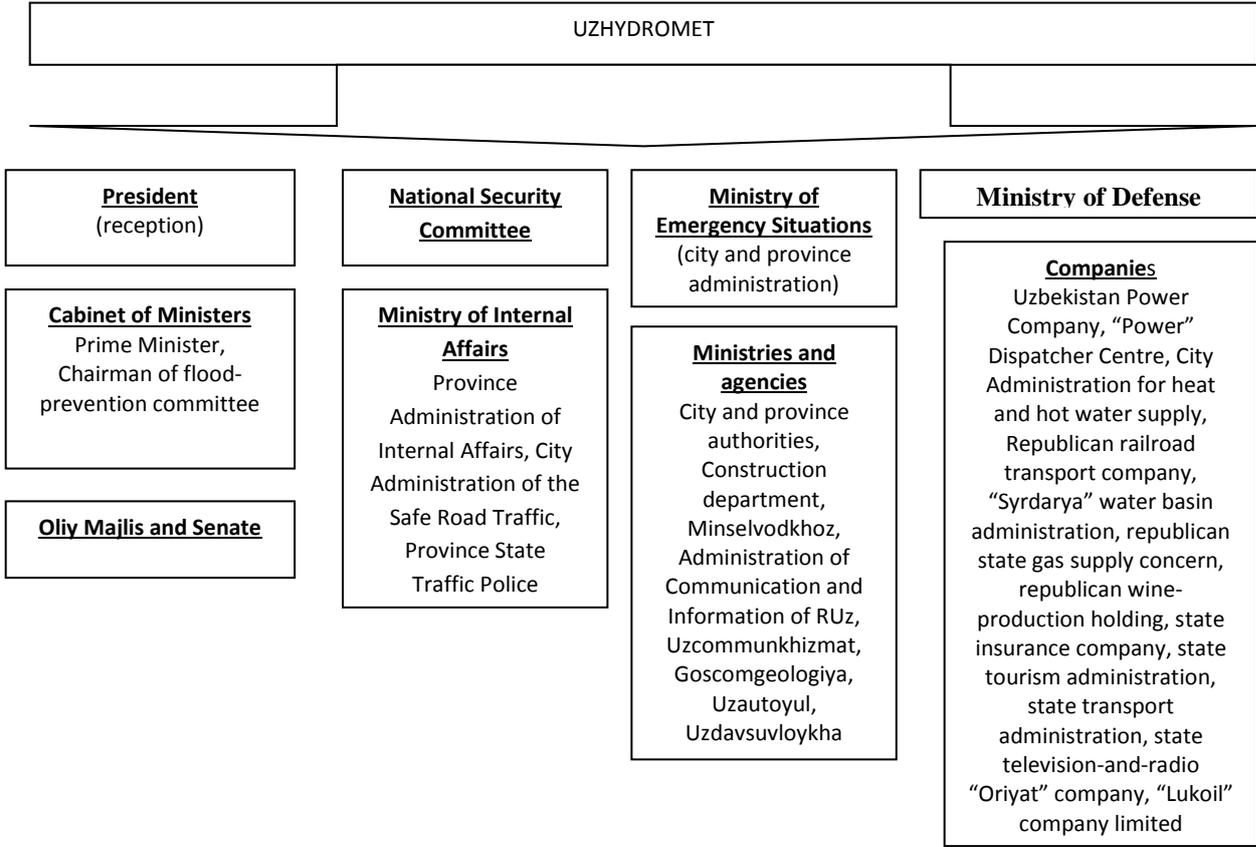


Image 1. Scheme of warning for the main hydrometeorological disasters.

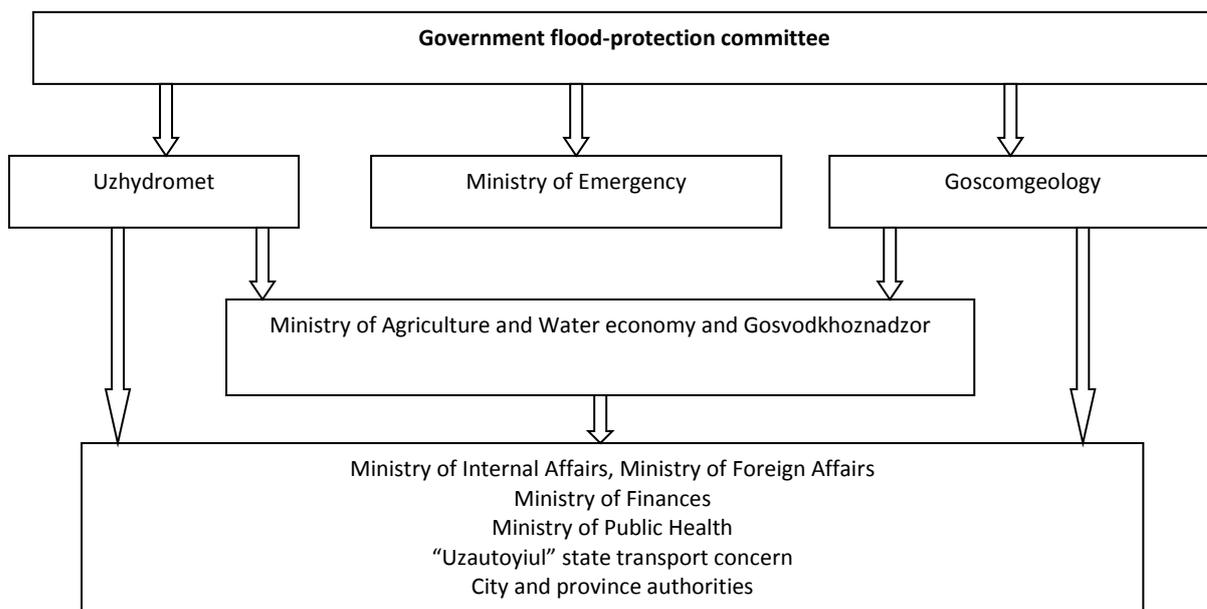


Image 2. Ministries and agencies participating in monitoring of nature disasters.

Any warning is preceded by the work of different specialists of Uzhydromet. It is needed to collect, critically monitor and analyze raw information or processed forecast information, to enter the information to the calculation forecast systems and to make calculations, critically monitor and analyze the results, to make decisions on the qualitative and quantitative forecast characteristics (warnings), to approve and issue the forecast (warning), and finally, to inform the bodies of the government and economy administration, the relevant agencies and institutions of the Republic of Uzbekistan.

Uzhydromet carries out the monitoring of nature disasters using all up-to-date types of observations – satellite information, surface monitoring and keeping the information system on dangerous hydrometeorological phenomena.

With the possibility of risk of hydrometeorological danger Uzhydromet forwards the relevant warnings to the Ministry of emergency situations and other government bodies responsible for decision making.

Any of similar schemes includes Ministry of Emergency Situations, Ministry of Internal Affairs, Ministry of Defense, Ministry of Agriculture and Water economy (Minselvodkhoz) as well as the agencies, enterprises and mass media concerned. Ministry of Emergency Situations is responsible for the distribution of warnings for population and taking measures for reduction of disasters and liquidation of aftereffects of the possible catastrophes.

Besides, the relevant ministries get the warnings depending on character of manifestation of dangerous hydrometeorological disaster. For example, the agencies of the public service receive the warnings about possible storm phenomena which can cause damage to the transport and other communications in populated areas (heavy snowfall, heavy rains, etc.).

When the risk of drought and low water occurs, the warnings are forwarded to the Ministry of agriculture and water economy which enables to take necessary measures directed to elimination of consequences of drought and low water in agricultural sector.

In the period of mudflow or avalanche activity the warnings are forwarded to all government bodies responsible for operation and maintenance of the road communications and recreation service.

With the risk of possible avalanching the warning is realized through the scheme presented on Image 3.

One of the main components of the development of the early warning system is the monitoring of disasters related to the climate change, as the global climate change resulted in the change of the character of disaster manifestation and increase of their frequency, especially regarding the frequency of such extreme phenomena as droughts, mudflows, catastrophic floods and storm phenomena.

All these processes are under the constant monitoring while the forecast models are corrected respectively.

Uzhydromet is responsible for maintaining two state cadastre: State Water Cadastre "Annual data on the regime and resources of surface waters" and «State cadastre of zones of high natural hazard. Unit: Areas of increased hazard hydrometeorological phenomena». State water cadastre is prepared jointly with the Goscomgeology (Groundwater) and Minselvodkhoz (Use of water).

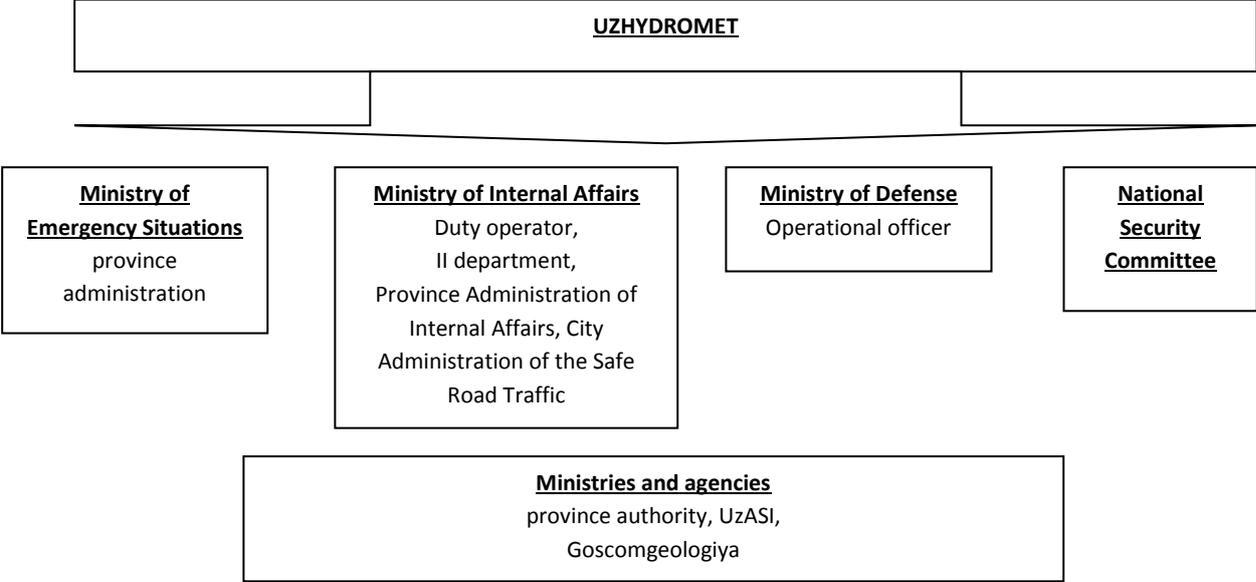


Image 3. Scheme of warning on possibility of avalanching.

The State cadastre of zones of increased natural hazards is prepared jointly with the State Committee for Geology – on areas of increased geohazards (AIG), and the Institute of Seismology – on areas of high seismic risk (AHSR). Uzhydromet is responsible for part on areas of increased hazard hydrometeorological phenomena. For that purpose the methodical guidance was developed and list of hazards was defined, information of which will be enter in the cadastre. The following phenomena include:

On the basis of bilateral agreements the exchange of hydrological and meteorological information was arranged, including storm warnings with the Central Asian counties. The list of transmitted information is presented in details in the agreements and the means of

transmission are described. Under agreements the exchange of operational data, historical data, forecasts and estimates are implemented.

At the national level dissemination of hydrometeorological information in ministries and agencies is carried out by fax and Internet.

One of the main activities in the dissemination of warnings are the media including the dissemination of mobile operators, with the following dissemination of SMS messages, with appropriate recommendations - risk during heat waves of heat, during avalanche and mud flow hazards.

<i>Hydrometeorological Dangerous Phenomena (DP)</i>	<i>Hydrological DP</i>
<ul style="list-style-type: none"> • number of days with extreme air temperatures; • number of days with frost; • number of days with heavy precipitation; • number of days with strong wind; • number of days with atmospheric drought. 	<ul style="list-style-type: none"> • floods; • flash floods; • underfloodings; • hydrological drought; • mud flows; • avalanches.

The mass media (television, radio, newspapers), website of Uzhydromet (www.meteo.uz), cellular communications use for public warning in Republic of Uzbekistan.

One of the main components of the development of the early warning system is the monitoring of disasters related to the climate change, as the global climate change resulted in the change of the character of disaster manifestation and increase of their frequency, especially regarding the frequency of such extreme phenomena as droughts, mudflows, catastrophic floods and storm phenomena.

All these processes are under the constant monitoring while the forecast models are corrected respectively.

Therefore the basic concepts to solve of problem for saving of hydrometeorological safety, and on the basis to formulate the range of measures and actions, integrated implementation of which could play a significant role in reducing of disasters caused by severe weather events:

- It is necessary to develop a common strategy to ensure the safety and mitigation of effects from dangerous hydrometeorological phenomena with the inclusion into the national development plan.
- It is necessary to develop and improve methods of long-term forecasting of factors of hazards through the development of the expected climate change scenarios.
- It is necessary to develop and implement of early warning of dangerous hydrometeorological phenomena with long advance time.
- It is necessary to develop and implement of methodologies on assessment of damages assessing damage from dangerous hydrometeorological phenomena.

As preventive steps and actions for mitigation of hazards are the following:

- During the economic development of mountain and foothill areas subjected to dangerous hydrometeorological phenomena it is necessary to carry out the detailed economic and environmental studies in each case. Their goal – identification of ways to obtain the greatest possible economic impacts of the development of these areas and at the same time to minimize possible damages from dangerous hydrometeorological phenomena.

- In developing of the anti-mudflow and anti- flood events in the river valleys the whole drainage area should be considered, rather than its separated parts. Local activities

are not considering the whole situation of passage of mudslide or flood in the river valley, can not only provide the economic benefits, but also significantly worsen the situation as a whole and as a result in more damage.

- It is necessary to skillfully combine the engineering methods of protection with non-engineering ones. First of all, it includes: restrictions or full prohibition such economic activities, which may result in increased dangerous hydrometeorological phenomena. In addition, only those economic activities should be carried out on hazardous areas, which will have the least damage in the case of occurrence of dangerous phenomena.

- The engineering structures for protecting of land and commercial facilities must be reliable, but their implementation should be associated with minimal disruption to the environment.

- The clear zoning and mapping of areas should be carried out, which is exposed to hazardous phenomena. Taking into account the form of economic use of the territory, it is recommended to be encouraged to allocate the zones with different degrees of risk of dangerous hydrometeorological phenomena.

- The importance should be given to public early warning about possibility of dangerous hydrometeorological phenomena, explanation of probable effects and measures, which to be taken in case of its occurring. For this purpose, the television, radio and other mass media should be widely used. The knowledge about dangerous hydrometeorological phenomena should be to be widely displayed in liable areas. All state agencies, as well as every citizen should clear understand that they are required to do before, during and after the dangerous hydrometeorological phenomena.

- The state and public organizations, and private individuals should be included in a system of events for protection from dangerous hydrometeorological phenomena. The successful operation of such system must be coordinated and directed by the central authority at the national level.

- The implementation of these measures will improve the quality of warnings of disasters hydrometeorological phenomena, provides risk assessment, frequency and intensity of dangerous hydrometeorological phenomena for climate anomalies, create the foundation for long-term planning to reduce losses from natural disasters, reduce their negative impacts on the economy of Uzbekistan and environmental safety of region.