

## Conceptual Framework for Ensuring Security of the Territory and the Management of Natural Risks

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**Abstract:** The article considers the issues of environmental security (ES) of the territory as a very important policy and system in reducing the impact of natural hazards on the population and economy. Noted that the objects of ecological safety are life and health of the population, material and spiritual needs of a person, natural resources and natural environment. Accordingly, the policy should be ES purposeful activity of the state, public organizations, businesses and individuals.

**Key words:** Natural hazards • The security of the territory • Environmental safety • Policy and security system • Risk management • Environmental management • livelihoods of the population

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### INTRODUCTION

The security system of the territory is a complex of legal, technical, medical and other activities aimed at maintaining the balance between nature and man and natural external loads. ES is achieved by a system of measures (forecasting, planning, early preparation and implementation of a complex of preventive measures), providing a minimum level of adverse effects of nature and the technological process of its development on the livelihoods and health of people while maintaining adequate and safe growth of the economy.

### MATERIALS AND METHODS

Based on the analysis of the Russian and foreign literature attempt was made to consider the main issues and problems in ensuring the security of the territory. On the basis of analytical and comparative method and recommendations made in the reduction of natural hazards and risks.

### RESULTS AND DISCUSSION

Ability to deal effectively with natural hazards is to know not only their genesis and character development,

but the ever-increasing growth and causes loss of society. Among the many reasons for the increase damage from natural hazards, marked I.I. Mazur and O.P. Ivanov [1], focus on three main ones.

The first reason is considered to be the growth rate of the world population. If at the beginning of the XIX century. Population was only 1 billion today-more than 6 billion, by 2050, the UN predicts 8.9 billion.

The second reason is the process of urbanization. The urban population is growing even more rapidly. With all of this, the most vulnerable to dangerous natural processes (earthquakes, floods, slope processes and other) in the urban context, those who are restricted in their choice in terms of access to housing and employment. Residents of dangerous areas wouldn't live there if they had an alternative. For them it is the best of the worst scenarios, impending disasters, such as lack of housing and lack of permanent income and social security. Socially vulnerable families have only the freedom of choice-a choice of a kind of disaster. Within the available selection minimizing vulnerability to the same danger and the increased vulnerability to others. Often mastered unsafe territories, such as the slopes of hills and mountains, lowering the courses of the rivers, ravines, wetlands, sanitary and protection zone and dangerous areas.

The third reason-the global warming of the planet, which in recent years has become one of the most pressing problems of our time. With the warming climate began to change mode of exchange between the atmosphere and ocean. In the future, sea level rise due to melting glaciers will inevitably lead to shoreline retreat inland, resulting in displacement of the boundary of continuous permafrost to the north: 2020-50-80 km by 2050-at 150-20 km. Correspondingly increase the amount of precipitation and hence, floods, landslides, etc.

In the inland areas, which include Kazakhstan, along with the aforementioned consequences, activation of drought will increase the amplitude of temperature and extreme indices and the increase in temperature will lead to intensive melting of glaciers in the mountains and other dangerous consequences.

At all levels of government, regional and local management bodies, increasing the relevance of solving problems for the survival of the population in emergency situations, the number of which, despite the efforts made, not decreases and tends to increase.

Analysis of the experience of liquidation of consequences of emergency situations shows that the attention of the management bodies, as a rule, is paid to the organization of rescue works and rendering, unfortunately, not always timely emergency medical aid to the injured people. Organization of other types of life support of the population is carried out with great delay. Forces that operate in isolation, taking decisions on the go, poorly possessing information about the developments in the disaster area, as in other cases of incorrect and misleading. A classic example of proof of the foregoing it may serve as a case of the tragedy in the village of Kyzyl-Agash Almaty region [2].

One of the most important challenges of sustainable, including the safe development of the territory, is risk management of natural hazards. The transition region on the analysis and management of various risk management as a core system that ensures the safety of population and economy, should be to reduce the growth in the number of consequences from emergency situations caused by natural factors. Reducing the vulnerability of the population and economy of the emergency situations of natural and natural-anthropogenic origin acts as a fundamental policy of the state and local Executive bodies [3].

Risk management of natural hazards is a process of the optimal reduction of various types of risk to ensure

achievement of a level of safety of population and environment, which is only valid when existing in society, economic and social conditions, institutional and other mechanisms.

The goal will be as a result of the dismemberment of existing problems on a number of series of tasks, each of which pursues its own specific installation, objectives and end the desired results.

Currently there are certain principles which must meet the risk management of natural hazards. One of them is the principle proposed N. Klaus [4], whose point of view we share. They are the following:

- The priority is the welfare of society in general;
- Taking all possible measures to protect each member of the society from excessive risk, with the required consideration of the opinion of the member of the society;
- Activity cannot be justified, if it will be beneficial for society, but expose to excessive risk to the individual member of society;
- Members of the society voluntarily agree on the presence of risk does not exceed the excessive level of ensuring the development of society as a whole;
- Minimization of risk to the public should not be at the expense of its members.

The main objective of risk management is to increase the average life expectancy in society, when every member ensured the achievement of complete physical, mental and financial well-being, subject to the functioning of the severe restrictions on the impact of natural ecosystems. Risk management unfavorable and dangerous natural phenomena and processes is a series of tasks, each of which pursues its own goals and outcomes.

There are several points of view and approaches to this problem. Let us discuss some. In this paper, E.J. Henley and H. Kumata [5] proposed a comprehensive risk management scheme for the life of the population on a national scale in a specific area or in a particular area. It is a succession of tasks, such as identification of hazards-assessment and forecast threats-assessment and prognosis of emergencies-weather complex risk of natural and manmade-forecast individual risk for the population-compared with an acceptable risk-substantiation of rational protection measures-implementation of measures protection.

Hazard identification is to identify sources of risk in the study area (extreme and catastrophic natural phenomena, potentially dangerous objects technosphere). Threat Assessment is based on the establishment of spatial and temporal patterns unfavorable and dangerous natural phenomena and processes towards objects impact of their hazards.

In the next author's work [6] he states that events on the direct management of natural hazards include a variety of methods and technical means of direct intervention in the natural process (spraying in the atmosphere of special substances, causing torrential rains or preliminary soaking loess and implementation of their settlement), in order to prevent negative consequences of this process with its natural development. The author maintains that in most cases, natural hazards are out of regulation. Some natural hazards (erosion, landslides, mudflows) theoretically driven, however, the practical realization of this possibility in the specific conditions encountered great difficulties. To the greatest extent manageable techno natural hazards because they are created by humans and thus manageable through the regulated economic activity of people.

An attempt of comparative assessment of knowledge of natural processes (causes and mechanism), success, prediction and measures for protection against them is made S.M.Govrushko [7]. As an example, he notes that the essence of tornadoes is known about 25-30 % and in process of their occurrence is still a lot of mystery about it. The level of the forecast estimates of approximately 10 %, as it boils down to the fact that tornadoes can occur in either of those areas where they were before. Measures for protection from tornadoes are not much better, only 15 %, as they always arise unexpectedly, determine their trajectory impossible.

In solving the problems of risk management of natural hazards can be divided into four principles which should be considered as an integrated and coherent system. Each principle is a necessary condition for ensuring the sustainable and safe development:

- The principle of justification of practice-the strategic goal of risk management;
- The principle of optimization of protection-the tactical purpose of risk management;
- The principle of integrated risk assessment;
- The principle of ecosystem sustainability.

As a set of measures aimed at mitigating the effects of emergencies of different origins, as one of the conditions for the risk management of natural hazards are:

- Protection of the population (providing protection in emergencies, evacuation) and primary life support in emergencies;
- Rational safe location of settlements and industrial forces;
- Engineering protection of territories;
- Elimination of areas of impacts and damaging factors sources emergencies;
- Preparation of objects of economy and life support systems to work in conditions of emergency situation;
- Preparation of rescue and other urgent works;
- Establishment of insurance Fund of emergency;
- Informing the population about the possibility of emergencies and their preparation for action in emergency situations;
- Complex analysis and assessment of emergencies, studying their impact on the environment and the resident population;
- Designing maps of sources and centers, determination of initial data for forecasting of emergencies;
- Substantiation of the system of measures for the establishment of a unified national system for monitoring, forecasting of emergencies and of their consequences.

The legal basis for the functioning of the State system prevention and liquidation of emergencies is the Constitution of the Republic of Kazakhstan, the laws of the Republic of Kazakhstan Law "On Emergencies" and other legal acts of central and local executive bodies.

In accordance with the legislation of the Republic of Kazakhstan natural disasters and other emergency situations of natural and technogenic character, epidemics and epizootics assigned to the national security threats. Protection of population, environment and objects of economy of emergency, from the consequences caused by them, is considered a priority area of the state policy. Issues of organization and conducting of civil defense are one of the tasks, the main activity of which protection from emergency situations of natural and technogenic character. Protection of the population and objects of economy are considered as one of the most important functions of the state as part of its defence activities.

Information about emergencies and catastrophes that threaten the security and health of people, as well as the natural disasters, their official forecasts and consequences are not subject to secrecy.

The main coordinator in the management and prevention of emergency situations of natural and technogenic character is the Ministry of emergency situations (MES) of the Republic of Kazakhstan, its regional and district offices.

**The main tasks of the MOE are:**

- Participation in development and implementation of state policy in the field of prevention and liquidation of emergencies of natural and technogenic character, Civil defence, fire safety, as well as oversight of safe conduct of work in industry and mining;
- Securing of functioning and further development of the State system of prevention and liquidation of emergencies;
- Organization of development and implementation of target programs aimed at the solution of tasks of emergency situations and Civil defense.

In the basis of the modern strategy of population protection from natural disasters based on forecasting and timely warning of the population about the impending distress and danger. In the framework of the state policy of protection of the population, objects of economy and environment from emergency situations ministries, agencies and scientific organizations, higher educational institutions and other institutions work on monitoring and forecasting of natural disasters. The bases of the specified activities are observing system conditions and the occurrence of dangerous natural processes in the atmosphere, hydrosphere, lithosphere, biosphere and also in the commercial sector. It is important to note that the current structure of management of natural and technological hazards is a sufficiently established and the multilateral sphere. However, the activity patterns wants fast improvements and radical change of the existing approaches in prevention and liquidation of consequences of emergency situations. Consider the most topical and high lyrelevantones.

As is known, in fact, warn the public of impending danger (storm warning) in any territory play operational mass media, which, depending on the type of threat is transmitted by certain sources (radio, TV, sirens and

other). Among a big number of unique role playelectric sirens that in the past decades were almost all localities and were in good technical condition. Unfortunately, at the present time the system of warning to the population in case of emergency the morally and physically obsolete and requires prompt transfer to the digital system. In addition, they are not available in every locality. According to the Almaty regional Department of emergency situations [8], there is another issue that complicates the process of warning to the population in case of emergency. Annually reduced the number of electric sirens in the region.

So, if in 1991 there were 483, then now there are only 212 units. When as a need in the Almaty region electro sirens are currently about 490 units. Also, the operating expiration warning equipment were developed in 2006 (technical operation of these means of communication on standards is not more than 15 years). As a result, there is the following pattern: if the retransmission of television channels "Zhetysu" covered almost the entire territory of Almaty region, over the past 10 years, wired radio in towns and villages completely reduced. Also appears at the end of the 90s commercial broadcast covers only large settlements. In existing grids telecasts no special programs educational and informative on situations and issues of natural and technogenic character.

In Almaty oblast Department of the emergencies together with the regional Directorate of telecommunications OJSC «Kazakhtelecom» and broadcasting company «Zhetysu» worked out the options for notification of the population about possible emergency situations of natural and technogenic character using television and radio. For rapid transmission of information in the television and through the centralized notification prepared and laid recordings in the state and Russian languages on the actions and behavior of the population in case of emergencies and after the signal «Attention all!». But, despite all efforts, the fact is that the administration departments for emergency situations will learn about emergencies much later and, in most cases the victims and distress of the population.

Formed in the 90s of the last century economic crisis, contributions to private enterprises and joint stock ownership types, as well as weakening of attention to civil defense by the state worsened condition of the status of civil defense.

In the process of privatization of enterprises was held illegally crossing into private property funds and property of civil defense. Were unqualified decommissioning and

destruction of protective constructions of a formerly state-owned. Many of them are transferred in private and other ownership, which are used not for their purpose or completely eliminated. With the transfer of these areas in other hands disappeared and the basic Foundation of civil defense (tents, stretchers, gas masks, medical supplies and drugs and other personal protection). In many localities, including in the major cities is not on the proper level supported places of mass gathering of people evacuation in an emergency. A large part of the protective structures require major renovation, or they are not suitable for further use, i.e. they are unsafe to use.

Construction and reconstruction of buildings and constructions of civil and industrial use is conducted without proper alignment, contrary to all norms and rules of safe neighborhood and stay in it. From the practice of application of almost disappeared experience latched warn illustrative schemes and plans on the walls of houses («the gathering Place of the earthquake», «Safe area» etc). The examples of the existing deficiencies are only a small part of the problems that require urgent solutions.

### CONCLUSION

Thus, the ecological security is a state of protection of the natural environment, life and health and other vitally important interests of a person from the negative impact of emergency situations of natural and technogenic character. The primary goal of state policy in the field of human development should be consistent reduction of risks of emergency situations of natural and natural-technogenic character, enhanced public safety and the protection of strategically important objects from the threats of natural and natural-anthropogenic nature, as well as provision of the necessary conditions for safe living.

One of the main conditions for sustainable socio-economic development should become the ecological safety of the territory, which is provided through the protection of vital interests of the person, created the consequences of anthropogenic impact on the environment, as well as from natural disasters and catastrophes. The observed changes in the development of society and its interaction with nature is not always correspond to the principles of sustainable development, which implies the balanced development of its economic, social and environmental aspects.

Improving the quality of life of the population by lowering the risk of emergency situations of natural and natural-anthropogenic nature, increasing to an acceptable level of safety and security of the population should become one of the main conditions for sustainable socio-economic development of the country and humanity in general.

### REFERENCES

1. Mazur, I.I. and O.P. Ivanov, 2004. Hazardous natural processes. Introductory course. Textbook, Moscow: Publishing House of the "Economy", pp: 702.
2. Abdimanapov, B.Sh., 2012. Geography of natural hazards and risks: the textbook. Almaty: KazNPU Abaya, pp: 240.
3. Abdimanapov, B.Sh., 2010. Risk management of natural hazards-as a condition for geo-ecological security in the south- east of Kazakhstan. Herald Kaz EU, 6: 341-346.
4. Claus, H., 1994. Fundamentals of Economic Management. Translation from English. M.: Infra M., pp: 218.
5. Henley, E. and H. Kumata, 1984. Reliability of technical systems and risk assessment. Translation from English. Ed. V.S. Syromyatnikova. M., Mechanical Engineering, pp: 528.
6. Osipov, V.I., 2007. Assessment and management of natural risks (state problem) Geoecology. Ying. Geology. Hydrogeology. Geokriologiya, 3: 201-211.
7. Govrushko, S.M., 1999. The impact of natural processes on human activities. Vladivostok: Far Eastern Branch, pp: 185.
8. <http://www.meta.kz/134746-v-almatinskoy-oblasti-sistema-opoveshheniya.html>.