2011 Tohoku Earthquake and Tsunami Recovery

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Summary Of The Event

An earthquake off the east coast of Honshu Island in Japan (the Pacific Ocean, affecting the Tohoku region “), also the Great East Japan earthquake is an earthquake of magnitude, according to current estimates from 9.0 to 9.1 occurred on March 11, 2011, at 14:46 local time. Seven years ago in Japan, there was a natural disaster equal to what was not in the modern history of the country. Exactly on March 11, 2011, at 14:46 local time (08:46 Moscow time) in the Tohoku region in the northeast of Honshu, there was an earthquake of magnitude 9, which gave rise to a tsunami of terrible force. Over the past ten years, there were 3,800 disasters in the world, which killed at least 780,000 people. In particular, in Japan, after the Great Eastern earthquake (2011), the number of earthquakes has increased. Before the Great Earthquake, about 300 tremors happened a year, according to information from the Japan Meteorological Agency [1]. From March 2011 to March 2015, 737 earthquakes with a strength of 1 to 7 points were recorded. This work is relevant because it contains useful information on the operation of the infrastructure of Japan during disasters.

For the whole world, the tragedy in Japan was remembered above all by the accident at the Fukushima-1 nuclear power plant, which almost turned into the second Chornobyl. The crisis at Fukushima has become a terrifying example of how a merciless natural element, multiplied by the dangers created in the process of human activity, can provoke a large-scale technological disaster. Fortunately, the most gloomy predictions from those that sounded in March 2011 did not come true, and the nuclear “apocalypse” did not happen, but the explosions and radiation emissions in the “Fukushima” had a profound depressive effect on all aspects of the life of the Land of the Rising Sun and forced all of humanity again to reflect on the benefits and dangers of using nuclear energy.

Relevant Issues, Including Ethical Issues, Affecting The Operation

The disaster led to the development of a serious accident at the Japanese nuclear power plant Fukushima Daiichi. In the conditions of the earthquake, the external power supply was lost. At the NPP, there was no provision for protection against tsunami impact on the station. As a result, the tsunami wave flooded the diesel generators that were located on each of the power units of the nuclear power plant below, in the water-filled part. Diesel generators are designed to operate the cooling system of the station when external power is cut off.

As a result of natural disasters, more than a million homes – mainly in the north of the Tohoku region – were destroyed or damaged. The earthquake and tsunami caused the accident at the Fukushima-1 nuclear power plant, which became the worst post-war nuclear disaster, as a result of which, however, no one died. In the first days after the triple disaster, about 470,000 people were forced to leave their homes. Two years have passed, but 315,196 of them still do not have permanent housing and live either in temporary shelters or with relatives.

To date, Japan, in the view of many observers, remains one of the most successful countries that created the “economic miracle” due to the talent of its people and the unique ability of this nation to absorb and creatively recycle the best practices of other countries. The earthquake in March 2011, at first glance, only confirmed the reputation of Japan as a truly developed and high-tech power. A huge number of victims of the disaster (according to official figures, 15 thousand 881 people were killed, another 2 thousand 668 were missing), certainly shocking, but almost all the victims were victims of tsunami of exceptional magnitude, not earthquakes. One can say with certainty that mournful statistics could be even more numerous if it were not for earthquake protection technologies successfully developed and implemented by Japan in recent decades and, moreover, constantly improving.

No country in the world is prepared for earthquakes better than Japan. According to experts, the most powerful earthquake was in March 2011. in itself, it was implicated in no more than 5% of all the destruction that happened. In the entire Tohoku region and in Tokyo, high-rise buildings were only swaying, but none of them collapsed. The example from one specialized report is very revealing: in the city of Sendai, near which the epicenter of tremors was located, the 18-story office complex built in 1999 did not receive any structural damage and was completely suitable for operation immediately after the earthquake. Like most multi-story buildings in the country, this structure was equipped with a system of so-called seismic isolation, including 36 rubber-metal and rubber-reinforced poles, which allow the base to oscillate independently of the high-rise part of the building.

Effective response to such disasters, to a large extent, depends on the behavior of the population itself. As experts note, during the March earthquake, residents of Japanese cities traditionally demonstrated a high “culture of readiness” for such situations. TV footage witnessed the calm and discipline of people on the streets of Tokyo, amazing for an untrained observer, against the backdrop of shaking skyscrapers.

Were Japanese seismologists able to foresee an earthquake and tsunami of such considerable strength? In fact, Japanese scientists believed that the Tohoku region could not be subjected to a 9-point earthquake, so the defenses in case of a tsunami were calculated for the height of waves that could generate an earthquake of magnitude not more than 8. A deceptive structure of preliminary earthquakes played a cruel joke. Called foreshocks. Two days before the 9-point earthquake on the coast, an underground tremor of magnitude 7.2 was recorded, followed by several aftershocks with a magnitude over 6. In interpreting these data, seismologists made a mistake characteristic of human thinking, perceiving the recorded sequence as complete and not suggesting that it can be part of a

wider sequence. In fact, an earthquake of magnitude 7.2 turned out to be just a foreshock in relation to a record earthquake on March 11, 2011.

Problems And Constraints Faced By The Emergency Management Leaders

The Japanese leadership considers emergency situations as two types of ecological catastrophes: the first is related to processes of natural origin, and the second is a product of production and economic activity. Emergencies of natural origin are considered spontaneous – destructive processes and technogenic nature is an irrational use of technological progress which causes indirect or direct damage to human health.

One of the most important areas of activity of the executive bodies at various levels is the prevention of extreme disasters and the elimination of their consequences. The country has developed a number of legislative acts aimed at reducing material damage and reducing losses among the population. First of all, this is the Basic Law on Protection from Natural Disasters. In accordance with this law, the procedure for the operation of the subjects of power is established; the duties of officials are defined, as well as the nature of the measures for protection against emergency disasters and the procedure for their conduct. The country's leadership has created a national three-level system for the prevention of extreme disasters.

The first level (national) is represented by the Ministry for Disaster Prevention and its associated ministries and departments of Japan. The work of the national system is coordinated under the prime minister. As of February 2026, Japan's prime minister is Sanae Takaichi; Shinzo Abe left office in September 2020. The main tasks of this body are the development and implementation of an operational plan for the prevention of natural disasters.

The second level is represented by the government of prefectures. The head is the governor, who is responsible for carrying out activities developed on the basis of a national plan for the prevention of natural disasters. In his subordination there is a committee that deals with the prevention of emergencies by organizing interaction with the Japanese armed forces.

At the third, the lowest level (municipal) heads of cities and settlements are subordinated to their committees. These committees are developing plans for the prevention of emergencies, taking into account the living conditions of the population, the nature of residential and industrial buildings, the availability and development of transport networks and a warning system, as well as ongoing activities to train residents in emergency situations.

While the actions of the Japanese authorities to prevent and eliminate the consequences of the earthquake predictably received high praise from the world community, the development of the situation around the Fukushima-1 nuclear power plant turned out to be a shocking revelation for the

observers. It quickly became clear that the government, the nuclear regulator and the company operator of the Tokyo Electric Power Co. (TEPCO) can not share responsibilities and act in isolation, with a fair amount of improvisation. The culmination of this chaos was the emotional breakdown of then-Prime Minister Naoto Kan, who, at one of the meetings, literally yelled at the nuclear scientists, exclaiming: “What the hell is going on?”

The government and TEPCO ignored important information about radioactive emissions and what actually happens in the damaged nuclear power plant. Given the sad history of such misdeeds on the part of Japanese corporations and bureaucrats, it is not surprising that the local population was ready for the worst development of events. The company TEPCO has repeatedly been involved in scandals related to the concealment and falsification of information: in 2002, the company admitted that it systematically submitted false information to the supervisory authorities regarding the safety of its reactors, and in 2007, it turned out that she had hidden information about at least six emergency shutdowns of the reactors at Fukushima-1.

To understand how far the negligence can go, and sometimes the unprincipled frankness of Japanese corporations, it is enough to recall the shocking story of the chemical company Chisso, which, from 1932 to 1968, dumped mercury waste into the waters of the Japanese Gulf of Minamata. The local population, who consumed contaminated fish, fell ill with a “strange illness,” which led to severe damage to the central nervous system and often to death. In 1959, scientists found out the causes of the “Minamata disease,” and the company solemnly installed cleaning filters called once and for all to put an end to the poisoning of the population with mercury, but in fact, Chisso did not hesitate to poison mercury seawater for almost another 10 years.

In the middle of 2012, the Parliamentary Commission to investigate the circumstances of the emergency in Fukushima completed its work and, in the final report, recognized the crisis at the nuclear power plant as an “anthropogenic catastrophe that can and should be prevented and whose consequences could be minimized through more effective response measures.” The Commission found, for example, that TEPCO’s documentary management of emergency management did not provide for a scenario of a complete power outage at nuclear power plants that materialized at Fukushima. The station was not ready for the tsunami: the walls surrounding the nuclear power plant did not exceed 6 m, and the height of the waves that hit the nuclear complex was more than 10 m. warned the company about the possibility of a tsunami with 10-meter waves, but TEPCO did not believe these statements.

Perhaps the biggest revelation of the final report was the conclusion that the accident at the “Fukushima” was purely “Japanese” in spirit. The Western media widely disseminated a quote from the report that expressed the latent complexes of Japanese society against the backdrop of the almost existential crisis that befell the country in recent decades: “The fundamental causes of the catastrophe lie in the entrenched traditions of Japanese culture – our innate obedience to the authorities, our reluctance to question the power, our commitment to “following the program,” our group consciousness and our isolation from the outside world. ”

The Western commentators were skeptical about this conclusion, regarding references to “cultural foundations” and “mentality” as an elegant way to get away from a specific answer to the question: “Who is to blame?” All the recent experience of mankind confirms that the Fukushima crisis is on par with events such as the September 11 attacks, hurricane Katrina in the United States or the global financial crisis, and thus demonstrates, rather, the universal management problems in the realities of the modern world with its intricacies of hidden risks and unforeseen threats.

It is common for mankind to underestimate or ignore the risks of unlikely catastrophic events, especially if management of such risks requires huge financial costs. In the modern era, a person tends to quickly forget about the worst catastrophes, and the media remembers them only on tragic anniversaries. As one philosopher said, “People do not get smarter just because it’s about the survival of humanity.”

Conclusion

In the course of this work, three main topics were studied and reviewed: general information on emergencies, prediction infrastructure, disaster management and rescue activities for natural disaster survivors. Natural disasters can arise both independently of each other and in interrelation: one of them can entail another. Some of them often arise as a result of not always reasonable human activities (for example, forest fires, industrial explosions in the highlands, and dam construction, which often leads to landslides, snow avalanches, glacier falls, etc.). Japan is taking all possible precautions and protecting people, developing the country’s infrastructure. Active participation in the work with the population is made by the Japan Meteorological Agency and the Self-Defense Forces of Japan.

In 2015, Japan allocated four billion dollars for international cooperation in the field of disaster risk reduction. The country also intends to train 40,000 specialists in this field from different countries. In the course of the work, emergency situations were also divided by species. The functions of the ground forces, the special medical detachment of the Japanese air force, were studied. In addition, a method for preventing natural disasters, etc., was considered through the J-Alert warning system.

In this paper, the following tasks were solved:

- The concept of natural disasters and their types have been studied and defined.
- Measures to save and protect the country’s population have been studied.
- The specifics of the work of the organization that deals with monitoring, prevention, and liquidation of the consequences of natural disasters were considered.

The data contained in the work can serve as useful information and instruction for tourists visiting Japan, as well as for the Russian-speaking reader who is interested in Japan.

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