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Drugi naučno-stručni skup sa međunarodnim učešćem

INŽENJERSKI MENADŽMENT U ZAŠTITI VODNIH RESURSA

ZBORNIK RADOVA

Urednici

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WATER AS A SECURITY RISK IN THE REGION

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Abstract: *Water represents a significant factor of life on Earth. Pure and healthy water, in addition to the sun and the sun's energy and earth, is a source of life. However, water often can be the cause of major problems and the trigger of major catastrophes, such as large floods. Climate change is causing major natural disasters. Large precipitations lead to flooding of rivers from their watercourses, which automatically causes floods with devastating consequences. Most countries that encounter flood problems do not have adequate defense mechanisms from them, because for them, this problem is a novelty. The frequency and intensity of the floods have changed drastically. There is a need for building flood protection facilities, maintaining a drainage system and creating a new and more efficient infrastructure to deal with the problem of flooding. For the region, it is characteristic that the floods are extremely frequent, intense and with great consequences, and that the defense system is at a very low level.*

Keywords: *water, rivers, troughs, floods, protection.*

1. THE ROLE AND IMPORTANCE OF WATER

Observed from the distance, our planet Earth is blue, because the water areas dominate on it. Statistics say that as much as 71 percent of the Earth's surface is water, which in the Solar System separates the Earth as a very special one. The largest water surface on the Earth is the oceans and the sea, which make up 97 percent of the total water mass, while the rest of only three percent are rivers and lakes. In addition to water in the liquid state, there are water in the ice in the form of ice and ice glacier on the Earth. Also, water can be overhead, and then we talk about the oceans, seas, rivers, swamps, lakes and ice surfaces, and can also be underground. Groundwater consists of underground rivers, lakes and swamps [Jokić, Janošević, Nikolić, 2017: 143-150].

VODA KAO BEZBEDNOSNI RIZIK U REGIONU

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Apstrakt: Voda predstavlja značajan faktor života na zemlji. Čista i zdrava voda, pored sunca, sunčeve energije i zemlje, predstavlja izvor života. Međutim, voda često može biti uzrok velikih problema i da predstavlja okidač ogromnih katastrofa, kao što su velike poplave. Klimatske promene izazivaju velike prirodne katastrofe. Velike padavine dovode do izlivanja reka iz njihovih vodotokova (korita), što automatski uzrokuje poplave sa razarajućim posledicama. Većina zemalja koje se suočavaju sa problemima poplava nemaju adekvatne odbrambene mehanizme od istih, jer za te zemlje ovaj problem predstavlja novinu. Učestalost i intenzitet poplava su se drastično promenili. Postoji potreba za izgradnjom objekata za zaštitu od poplava, održavanjem sistema za odvodnjavanje i stvaranjem nove i efikasnije infrastrukture za rešavanje problema poplava. Za ovaj region je karakteristično da su poplave izuzetno česte, intenzivne i sa nemerljivim (velikim) posledicama, kao i to da je sistem odbrane protiv poplava na veoma niskom nivou.

Ključne reči: voda, reke, korita (vodni tokovi), poplave, zaštita.

Water is a necessary ingredient for the life of all living beings and organisms on planet Earth. According to experts in the medical profession, taking a sufficient amount of water in humans can cause unexpected consequences, and the ultimate outcome would be death. The fact that the human body makes water about 60 percent says that people without water cannot. Extreme cases and situations have proven that a human organism can withstand water for at least a week, with very large and harmful consequences.

However, in addition to this, it should be emphasized that water is a prerequisite for the economic and cultural development of each country. This is especially borne out by the fact that large metropolises and ancient countries were always set up beside the great rivers, lakes, on the shores of the sea and the ocean. Waterways were a prerequisite for the development of maritime trade, then the construction of ports, the conquest of new territories, water was used for the construction of aqueducts and waterworks, which created the need for water for the needs of the ancient peoples for the purpose of maintaining personal hygiene and hygiene of the place they lived in. More recently, water has been exploited as a significant economic potential, for the creation of a hydroelectric plant, a steam-powered machine, and so on.

So, water is the basic element of life on the planet Earth. Her role and significance are multiple, and water quality and watercourse protection should be taken into account in particular. Today alarming fact is permanent water pollution and an unwanted attitude towards them, as well as to the environment in a global sense.

2. NATURAL DISASTERS AS A SECURITY RISK

The nihilistic relation of a modern man to nature, land, water and air, as well as green surfaces and natural oases, has led to the fact that today's conditions of life on our planet are drastically worse than it was before some not so long ago. A modern man strives to subordinate all his conformist interests and needs to today, and to do everything to nature and natural phenomena, putting him in the role of a faithful servant. To a large extent, he succeeded in this because natural resources and potentials are really great and valuable. Nature and natural resources are grateful, but the problem is that modern people did not want nature in any way to recapture, but were constantly polluted, they unmanaged shriveled the forests and occupied the green areas, polluted the atmosphere by building heavy factories, polluted water poisons and other harmful substances and destroyed what is most valuable on our planet and what is the source of life, which is the ozone layer.

Today, at the turn of the 21st century, modern humanity begins to harvest the bitter fruits of such a relationship and behavior towards nature. Natural disasters are becoming more and more common on the entire surface of the planet. The devastating winds, tsunamis, heavy rain, and snowstorms are becoming a growing security risk, which must be treated today adequately from the security aspect, so as not to allow such disasters to continue to result in a large number of casualties and material damage. According to meteorological experts, the cause of such disasters should be sought precisely in the constant pollution of our planet, in the constant emission of harmful gases into the atmosphere, causing the so-called the greenhouse effect. This effect contributed to a significant increase in the average air temperature on an annual basis, as well as significant shifts in the current climatic and meteorological conditions. Also, the North Pole, which has a significant place in global me-

teorological trends, is becoming warmer, dissolving multilayer layers of ice, which has a favorable effect on negative climate change, resulting in catastrophic disasters.

3. FLOODS AS A SECURITY PROBLEM

Flood can be defined as a natural phenomenon, which manifests itself through an abnormally high water level, resulting in the flow of water surfaces from its natural basins, causing flooding of the surrounding area. Floods are typical for rivers and lakes, while the seas are somewhat less common. The cause of the floods is intense and strong atmospheric precipitation, although it may also be the cracking of dams and waterproof objects, and may also be the result of diversion and terrorist acts. Floods were also present in earlier years, and according to estimates, during the 20th century, about 2.3 million people died in floods and natural disasters. In 1931, the strongest flood hit China, when the flooding of the great rivers, Yangtze and the Yellow River.

Floods can be divided into floods due to strong atmospheric precipitation, floods resulting from the melting of large amounts of ice in rivers, floods caused by landslides or earthquakes, floods due to the breakdown of dams and warfare. Then, we can classify the floods according to the time of formation of the flood wave to calm, which takes more than ten hours for the formation of a large wave, then torrential, which occur on the mountain streams, which are formed within less than ten hours, then the accidental, currently, with strong destructive power and ability to destroy water and hydroelectric facilities [Filipović, Jovančević, Jažić, 2016: 222-227].

Floods were frequent on rivers, lakes and canals in both climatically dry and climatically wetter regions. Floods can be slow and fast-moving or torrential. Slower floods are characteristic of large rivers with large floodplains. They occur as a result of abundant atmospheric precipitation, excessive dissolution of snow or ice, monsoons and tropical cyclones. Rapidly torrential floods are typical of smaller rivers, mountainous, located on inaccessible and leaky terrains. They are caused by severe weather conditions accompanied by intense precipitation and thunderstorms, dumping of dams, landslides and melting of ice surfaces.

Floods on the seas are usually due to a combination of tidal shocks caused by strong winds or barometric pressures. Storms are caused by extremely high waves that exceed the defenses and blue settlements along the sea shore. Most commonly, these blue waves arise as a result of tsunami or tropical cyclones, as well as storms that drastically raise the sea level over a steady tidal level.

In addition to the above-mentioned floods, which mainly affect the belt near rivers, lakes, canals and seas, floods can also be cities, and then they are talking about urban floods. Large populated cities and cities are subject to flood due to large atmospheric precipitation that cannot be absorbed by rainwater collectors. Also, if cities are in flood zones, floods are more frequent. They can also occur due to the melting of a large amount of ice surfaces, followed by large storms and thunderstorms and spills from water and sewage installations. In urban floods, discharged water is retained on surfaces, penetrates into buildings and causes great material damage.

Flood, as a security problem, occupies a very high place. It has a devastating effect on people's property, infrastructure, and people's lives. The consequences of the flood are mea-

sured in multi-million dollar amounts and in dozens of human casualties. One of the major consequences of flooding must be the pollution of drinking water and the destruction of water and sewage systems, which jeopardize the health and lives of people. Therefore, this problem must be dealt with by adequate treatment and preventive measures taken, how not to occur and in order to minimize the consequences of possible floods.

4. FLOODS IN THE BALKANS

The region of the Balkans was hit by a devastating flood in 2014. It was commanded by a strong cyclone, which captured the central part of the Balkan Peninsula. Cyclone was named “Tamara”, and it formed over the Adriatic Sea when penetration of cold and humid air into the Mediterranean region. This front collided with the supra front, resulting in extremely low pressure. The focus of this cyclone was above Serbia and Bosnia and Herzegovina, where it was kept for a long time with heavy precipitation. On that occasion, the floods were affected by Serbia, Bosnia and Herzegovina, Croatia and Montenegro, and the rivers Sava, Sana, Drina, Vrbas, Bosnia and Zeta flooded. It was under water of several populated areas, such as Obrenovac, Lazarevac, Kostolac, Loznica, Sabac, Mali Zvornik, Bogatic, Koceljeva, Krupanj, Sremska Mitrovica, Sid, Svilajnac, Cuprija, Rekovac, Valjevo, Ub, Lajkovac, Ljig, Osečina, Mionica, Cacak, Lučani, Gornji Milanovac, Rača, Knić, Topola and Kraljevo in the Republic of Serbia [Novaković, B. 2015. “Floods in Serbia in 2014”, Water 2015 Institute for Water Management “Jaroslav Černi”, Belgrade]. On the territory of Bosnia and Herzegovina, flood victims were residents of Brcko, Maglaj, Doboj, Derventa, Tuzla, Prijedor, Travnik, Janja, Bijeljina, Zenica, Zivinica, Vareš, Zavidović, Ključ, Banjaluka and Čelinca [Đurica, 2015:97-99]. In Montenegro, it was most critical in the cities of Nikšić, Bar and Danilovgrad, while the floods in Croatia were affected by the floods in Županjska Posavina, namely Bosniaks, Soljani, Vrbanja and Posavski Podgajci [Perinić, Mikac, Vitas, 2014: 98-114].

Floods in the Balkans have caused serious damage. As an escalation of floods, landslides emerged, which jeopardized road infrastructure and housing facilities. About 4,500 kilometers of roads, 250 bridges, about 2,600 residential areas and about 80,000 hectares of arable land have been flooded due to floods and landslides. Approximately 30,000 people were temporarily evacuated from their homes, and evacuations were attended by members of the army, the police, firefighter’s rescuers and volunteers and activists of humanitarian organizations. In Bosnia and Herzegovina, there was a heavy supply of electricity, and at one point about 44,000 people were without electricity in their homes. In Serbia, 33 people lost their lives in these devastating floods, while the number of victims in BiH is 16. In Montenegro, dwellings in Danilovgrad, Medanovići and Bar, were damaged by floods, in which, besides the heavy rain, the storm blew. In Bar there is also a problem with electricity supply in the settlements of Stari Bar, Baukovo and Belveder. Under the water was the Old Town in Bar and the Bar Municipality building. On the main road Odoljen - Pržice came to the slipway, due to which the traffic was interrupted.

5. PREVENTIVE MEASURES

Prevention of flooding is one very important and studious procedure. This security problem must be dealt with in a serious way, as it is evident that it is becoming more and more frequent today, and that more and more frequent floods occur after each more abundant atmospheric precipitation. It is this fact that floods are no longer sporadic and rare, and deserve adequate treatment from the aspect of security. The basic task of security management, when it comes to flooding, is to build a prevention system so that floods can be kept under control as an adverse event and minimize its consequences.

There are several phases in the flood prevention process, such as planning, construction, monitoring forecasts and early announcements, information, maintenance and rehabilitation of anti-flood facilities and at the end, implementation of flood defense. All social factors, from the state itself, to the provincial and local self-government units must work on prevention and flood protection. According to the degree of risk, which is determined based on the position of watercourses, in relation to the state border and inhabited areas, the size and characteristics of the basins, the regime and characteristics of watercourses from the aspect of water exploitation and water exposure by adverse effects, water can be classified on the waters of the first and second waters order. The waters of the first order are of interstate character, while the waters of an internal character are in the second row of waters [Hadžić, 2017].

At the level of the Republic of Serbia, there are legal acts dealing with the problem of flooding. In 2011, the Government of the Republic of Serbia adopted a Decree on the establishment of a general flood protection plan for the period from 2012 to 2018, which regulates the institutional organization of floods. Each action in the fight against flooding is managed by the main coordinator, who is acting as the head of the administrative body in the ministry responsible for water management. Also, this act defines phases in the fight against floods. Depending on the degree of danger, a regular and emergency flood defense is distinguished. Regular flood defense is proclaimed when the water level at the measuring point reaches the level of regular flood defense, which is determined by the criteria for introducing flood measures. An extraordinary flood defense is proclaimed when the water level at the measuring point reaches the level of an emergency flood, which is also determined by the criteria for introducing flood measures.

In order to prevent floods, it is necessary to create a map of vulnerability and a flood risk map. These maps are designed for flood areas that are at a real or potential risk of flooding. They determine the boundaries of the flood areas, as well as the possible depths of water. Also, maps design damage caused by floods, both in terms of living and health of people, the environment, cultural heritage, property and economy [Pantelić - Miralem, 2015]. In addition to the aforementioned activities, the line ministry is obliged to undertake a flood risk assessment for the territory of the Republic of Serbia, then adopt an operational plan, adopt a risk management plan, coordinate activities related to the regulation of watercourses and protection against harmful effects and performs inspection supervision over the implementation of the provisions of the Act on waters, as well as by-laws. In the realization of these preventive measures, in addition to the line ministry, a public water company has an important place, which establishes and innovates the registers and cadastres of water facilities and flood protection facilities, realizes the tasks of watercourse regulation, prepares elabo-

rates for the maintenance of water facilities, develops documentation for protection from floods, creates maps of vulnerable areas, prepares flood risk management plans, provides the necessary people. Tools and other flood protection equipment, and prepares reports on the state of the protected water facilities.

6. CONCLUSION

The role and importance of water and water on Earth is extremely high. Without water, life on the planet would not be possible, nor would it be possible to carry out many social, economic, cultural and other activities. This is evidenced by the fact that old civilizations and cultures were created on the banks of the great rivers, which were the target for the ancient peoples to build their settlements. However, in the process of evolution, man and nature have greatly alienated themselves, all because of the intentions of men to bring nature to themselves, and that they are exploiting the unwholesome and taking everything from it, without returning anything to it. As a result of such a relationship, radical climatic and meteorological changes, accompanied by devastating winds, clumsy and abundant precipitation, have arisen, which often resulted in great material damage and human casualties.

In this regard, some of these consequences, such as floods, for example, need to be more closely studied and studied from a security perspective, especially from the aspect of their prevention. In the previous period, floods seriously affected the Balkans, and most of them suffered from Serbia, Montenegro, Bosnia and Herzegovina and Croatia. The essential issue today is the issue of controlling the flood risk, the construction of adequate protection facilities and their keeping in a state of goodness and usability, as well as minimizing the consequences of eventual floods.

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