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COMPARATIVE ANALYSIS OF DRM SYSTEMS IN GERMANY, USA, RUSSIA AND CHINA

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Abstract: The uniqueness of each system stems from the fact that the risks of disasters are specific and that their presence and manifestation are not universal and the same for every country. Just as no country is the same in all other segments, their disaster risk systems are unequal. The paper describes the systems in four different countries, through observation and comparison of four areas of activity that are implemented in dealing with disasters. First of all, in the paper, the legal basis and institutional frameworks on which these systems rest in each of the countries were considered – starting from the international level and guidelines given at international conferences, to all by-laws and local disaster activity plans. It was considered how each of the states implements risk mitigation activities and how it increases preparedness for them. When the system recognizes risks, their probability and the frequency of their occurrence, activities are planned to prepare the country and every individual in it for a potentially unwanted event. Differences in the ways of mitigating risks and preparing all elements of the system and protected values for disasters are presented. The third element of action in the event of disasters concerns the response. In this segment, questions are raised regarding institutional solutions in the system, division of responsibilities, the priority of response and mobilization of resources at all levels. The last phase, the one that occurs after the disaster, and that is the recovery from it, depends on the reaction. In the paper, it was discussed how in the end, when a disaster occurs and when damage to the population, environment, material and other goods occurs, how each of the states implements reconstruction, i.e. how it recovers - whether that recovery was previously well planned or whether ad hoc solutions are applied.

Keywords: disaster risk management, Germany, USA, Russia, China.

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1. Introduction

If the definition of risk given in the Terminology of the United Nations International Strategy for Disaster Risk Reduction (2009) is taken into account when considering the risk of disasters, where it is stated that risk is obtained from the combination of the probability of an event and its harmful consequences, the question can be asked, what are these events and what are the consequences if the subject of consideration is an organized state? In this case, the state can be viewed as an entity that has its laws, systems, geographical space, economy and sources of income, residents and their material, cultural and other assets. Harmful consequences that may occur due to the previously mentioned elements include the potential loss of life, injury, destruction or damage to property, interruption in the functioning of the economy, damage to critical infrastructure, interruptions in the supply of food, medical services, budget consumption and the like (El-Mougher et al. 2022; Aleksandrina et al., 2019; Hussaini, 2020; Kachanov, 2021). If a disaster occurs, whether natural or man-made, all consequences come into play.

In large systems such as the state, the risks understood in this way and all the potential damages that the risks bring with them are difficult to quantify and predict completely. What can be implemented is, first of all, to recognize what is characteristic of the given territory and what are the possibilities for preventing the occurrence of damage. On those foundations, systems are further built that include the recognized risks of disasters. As no country is the same, DM systems cannot be the same. This means that all state characteristics must be considered in the social, economic, political, social, cultural and cultural-historical framework. Also, not all risks can be given equal priority (World Conference on Natural Disaster Reduction, 1994).

Since disasters do not know borders between countries, there must be cooperation and coordination between the affected areas to respond promptly to the occurrence of a disaster. To achieve this, it was necessary for there to be a consensus at the highest, international level about the elements of preparedness, response and recovery from disasters that will be implemented in national DRM (DRM) systems. Each country establishes, maintains and changes its system, adapted to its normative legal arrangement, development and possibilities for DM (DM), and based on those given at the international level (Bobrowsky, 2013).

The following research conducts a comparative analysis of DRM systems in four major global powers: Germany, the United States, Russia, and China. In the face of increasing challenges posed by natural and man-made disasters, understanding and evaluating the effectiveness of DRM strategies employed by diverse nations becomes crucial. Each of these countries has unique socio-economic, political, and cultural contexts, influencing the development and implementation of their DRM systems. By examining the approaches taken by Germany, the United States, Russia, and China, this study aims to discern patterns, successes, and challenges in their disaster preparedness, mitigation, response, and recovery efforts. The insights gained from this comparative analysis not only contribute to the academic discourse on DRM but also hold practical implications for policymakers and practitioners seeking to enhance resilience in the face of an ever-evolving risk landscape.

2. Methods

The primary objective of this research is to provide a scientifically rigorous description and conduct a comprehensive comparative analysis of the DRM systems in the Federal Republic of Germany, the United States of America, the Russian Federation, and the People's Republic of China. The focus is on examining both international and national regulations that serve as the fundamental framework for the establishment and operation of these respective systems. In pursuit of this goal, a multi-faceted research approach will be employed, incorporating content analysis, comparative analysis, and historical methods to delve into the intricacies of the subject matter. The study aims to uncover the foundational principles underlying the development and functionality of the DRM systems in the aforementioned countries. To illuminate the origins and fundamental tenets of these systems, data sources will include internationally adopted documents as well as national-level strategies, laws, and regulations from each of the countries under consideration. By meticulously scrutinizing these documents, the research seeks to elucidate the core principles that form the bedrock of these DRM frameworks. Furthermore, to enrich the comprehensive comparative analysis, an array of data sources will be utilized. These include reports and publications from reputable international organizations, scholarly articles from scientific and professional journals, monographs, and a diverse selection of domestic and foreign literature relevant to the theoretical underpinnings of DRM. This holistic approach ensures a thorough exploration of the subject matter, drawing insights from a broad spectrum of authoritative and scholarly perspectives. In essence, the research aims not only to elucidate the regulatory foundations of DRM systems but also to foster a nuanced understanding of the diverse approaches and strategies employed by these four countries on both the national and international stages. Through meticulous examination and comparative analysis, the research endeavours to contribute valuable insights to the broader discourse on effective DRM practices.

3. Comparative analysis of DRM systems

3.1. DRM in Germany

When considering the normative legal framework for DRM, it is necessary to start from the Basic Law, i.e. of the Constitution of the Republic of Germany (1949). The Constitution regulates mutual assistance between federal states and provinces during disasters, financial assistance in the event of disasters, as well as budget management at all levels, including disasters. In addition, acts of importance in the field of disaster risk are the Law on Food Safety and Food Supply from 2019, the Law on Prevention of Disasters from 1999, the Law (Agreement) from 1998 and the Law on Civil Protection and Assistance in case of disasters from 1997. Examples of norms at the national level include the following acts (European Civil Protection and Humanitarian Aid Operations, 2021): a) German strategy for adapting to climate change; Implementation of the EU flood directive; "Flood Protection Program"; National strategy for the protection of critical infrastructure. Many German actors have many years of experience in DRM, but they have not always used this knowledge in a collaborative and coordinated way to tackle global challenges. German and regional actors working in networks have jointly developed and strengthened approaches to improve DRM worldwide.

The German federal government established the Global Initiative on DRM under the authority of the Federal Ministry for Economic Cooperation and Development (Global Initiative on DRM, 2022).

The Global Initiative (2022) focuses on strengthening civil protection and DRM, protecting critical infrastructure, preserving economic cycles and developing, upgrading and expanding early warning systems. The initiative thus supports the implementation of the international Sendai framework for disaster risk reduction and regional action plans. It develops demand-driven products and systems to ensure more effective DRM. The Swiss Agency for Development and Cooperation acts as a partner in financing and conducting regional DRM simulation exercises within the initiative. The range of services offered by the Global Initiative is based on an approach first implemented in Peru that systematically identifies the risks associated with investment projects. Risk mitigation measures are then selected and deployed according to cost-benefit projections. This also protects the sustainability of the investment itself. The Global Initiative is now refining and expanding this approach, focusing on its application in corrective management and disaster-resilient reconstruction (Global Initiative on DRM, 2022).

3.1.1. Disaster mitigation and preparedness

Germany's federal structure is reflected in its national DM system with shared responsibilities between the Federation and the federal states. "Civil protection" in the general sense is "protection of the population". It is a comprehensive concept and consists of 2 different elements: disaster protection and civil protection. According to the Constitution (1994), federal states are responsible for DM in times of peace. They enacted appropriate laws on DM, defining, among other things, the responsible authorities for DM and delegating several administrative and operational tasks to regional and local levels. In the case of defence, for example in times of war or armed conflict, the Federation is in charge of civil protection, as stated in the Federal Law on Civil Protection and Aid in the event of disasters from 1997 (European Civil Protection and Humanitarian Aid Operations, 2021). For some of its civil protection tasks, the Federation relies on the resources of the federal states and supplements them if necessary. This means that there is an integrated emergency management (EM) system. The Federation provides additional equipment, supplies and training to the states as needed and can support them in the event of a disaster at their request (disaster assistance).

The Federal Ministry of the Interior, Buildings and Communities is the superior federal state authority for civil protection. The role of this ministry is to coordinate interdepartmental cooperation and is generally responsible for national/internal security. The Federal Ministry of Home Affairs, Buildings and Communities oversees 2 national civil protection agencies. The Federal Office for Civil Protection and Disaster Relief performs specific tasks of the Federation related to civil protection, such as risk management, public warning, information and resource management, chemical, biological, radiological and nuclear defence and health protection, protection of critical infrastructure and cultural goods, research, international cooperation, etc. Specialists of the Federal Chancellery for Civil Protection and Aid in Disasters develop strategies, conduct crisis management exercises and raise public awareness to improve self-protection (European Civil Protection and Humanitarian Aid Operations, 2021).

The Federal Technical Assistance Agency is a government non-profit organization. As a technical-operational agency, its tasks include technical assistance and assistance in a large number of emergencies, in Germany and abroad (Kohlmann, 2021). The operational base at the local level relies on the volunteer potential of, for example, fire services, local DM authorities and relief organizations. More than 1.8 million volunteers form the backbone of the system, which is reinforced by full-time professional staff. Civil-military cooperation, due to shared responsibility in times of peace or conflict, as described earlier, is particularly relevant in Germany and is carried out at all administrative levels and includes planning, training and exercises. At the national level, the Federal Office for Civil Protection and Disaster Relief and the Joint Support Command of the Federal Armed Forces (Bundeswehr) coordinate civil-military activities. Identifying risks and contributing to disaster prevention through risk reduction requires a cross-sectoral approach. Both at the national and sub-national levels, preventive elements are incorporated into the legal and conceptual frameworks of various sectors such as the environment, health, agriculture, water management, critical infrastructure, urban planning, education, development cooperation consumer protection, etc. At the regional and local level, the competent authority can also consider preventive aspects in the sector concerned, involve appropriate DM authorities and thus contribute to a harmonized approach (European Civil Protection and Humanitarian Aid Operations, 2021).

Disaster risk control and disaster relief are public tasks in Germany. However, the government has transferred the responsibility of managing these tasks to the 16 states because Germany is a federal republic. The same applies to civil defence and civil protection in case of military or international risks. These 16 states are also responsible for rescue service, fire service and disaster risk control legislation (natural and technical disasters). Districts and cities without districts are responsible for the organization of these services (Domres, 2000). The German system is based on the principle of subsidiarity between official and private institutions. Many official and private humanitarian organizations are responsible for carrying out disaster relief tasks. In Germany, there are the following organizations: Federal Technical Support Service, Fire brigades/professionals and volunteers, Academy for Emergency Planning and Private Civil Protection German Rescue Association, German Red Cross, and Ambulance. Various organizations specialize in the fields of rescue, medical and social services, and disaster relief. These NGOs carry out 80% of disaster rescue activities and 95% of disaster medical assistance (Domres, 2000).

Non-governmental and governmental organizations employ more than 1.2 million volunteers and approximately 100,000 professionals. Rescue service is performed by professionals and assistance in disasters by volunteers. The German constitution allows the federal army to be called up in the event of a disaster, to support disaster relief organizations. In all districts and district-free cities, the administration establishes disaster control headquarters. During disaster relief operations, the operational command is on site (Domres, 2000).

In most counties and county-free cities, medical directors, rescue personnel managers and fire officials are responsible for the organization of medical assistance and rescue. All emergency physicians and medical managers have undergone special training or a 520-hour course. All medical service volunteers in disaster relief organizations are trained in special courses (90 hours). In recent years, civil protection, disaster relief and rescue services have been reorganized. Civil protection was reformed in 1997 by a new federal act. Federal

disaster relief is supported by the Federal Government with approximately 9,000 vehicles and a training budget (Kohlmann, 2021). Emergency physicians must participate in (80) eighty hours of emergency medicine from an interdisciplinary perspective; they are allowed to perform rescue missions only after providing basic experience in emergency medicine as well as after completing at least (18) eighteen months of postgraduate training period. Senior emergency doctors receive additional (40) forty-hour theoretical and practical training - after at least three years of practice in rescue services. Various institutions and organizations offer special training courses for medical and non-medical personnel to deal with disaster situations (Kohlmann, 2021).

3.1.2. Disaster response and recovery

When the first floods hit southwestern Germany in 2021, local emergency authorities were the first to launch rescue operations on the ground. However, soon after their response to the resulting disaster, it became apparent that the resources available at the local level were insufficient, as was the local governance itself. Such a disaster required a response that would have to be coordinated from the highest level in a defined chain of DM and responsibility. Competent authorities at the level of the affected districts coordinated the tasks of the police, firefighters and emergency services, which carried out activities to save the lives of the affected population and provide first aid in the most vulnerable areas (Kohlmann, 2021).

Only when crisis management at the federal level fails is the central government in Berlin allowed to ally with the Federal Office for Civil Protection and Disaster Relief. But for the Federal Office of Civil Protection and Disaster Relief to become actively involved in a crisis, the relevant community or municipality must first declare a state of emergency. And only then, the German armed forces can join the rescue effort, or the federal police forces are allowed to maintain law and order (Kohlmann, 2021).

Another organization often assigned to emergencies or natural disasters in Germany is the Federal Agency for Technical Assistance. Federal Technical Assistance Agency teams have special technical capabilities and expertise to provide effective relief, particularly in flood and earthquake disasters. The agency's membership of 80,000 members is primarily made up of semi-professional volunteers, who are also often deployed on relief operations abroad, for example, to restore utilities such as water and electricity to the grid (Kohlmann, 2021). During the current flood crisis in Germany, pumping crews within the Federal Agency for Technical Assistance have successfully prevented several dams from bursting (Ullrich, 2021).

Volunteerism is also the main feature of the work of millions of other rescuers and helpers organized in associations such as the charity and humanitarian organization - the German Red Cross (DRK), the DLRG German Life Saving Association and church humanitarian organizations such as St. John's Disaster Relief or the Maltese Help Desk (Ullrich, 2021). In Germany's most populous state, North Rhine-Westphalia, nearly 400 volunteer fire brigades are part of the state's fire protection structure and complement around 30 fully professional fire brigades (Ullrich, 2021). Monitoring water levels in German rivers and lakes is the task of flood control centres, which are also run by each of the 16 federal states. They should set off alarms in case of likely flooding. However, transboundary waterways, such as the Rhine River, are monitored by international commissions (Reuter, Kaufhold, Leopold, & Knipp, 2017; AXA XL Reinsurance & Cambridge Center for Risk Studies, 2013). In addition, the situation

was such that there was a possibility to allocate additional funds, which was confirmed by Finance Minister Olaf Scholz. According to the study (2013), he then said that the package, half funded by the federal government and half by the German state government, to help people deal with the immediate consequences of the floods, would eventually be bigger if more money was needed. According to the study, the finance minister at the time said: "We will do whatever it takes to help everyone as soon as possible." The authorities in the two affected states are responsible for the details of who receives how much money and how, but Minister Scholz said at the time that it was indicated that there would be no means test and that it would be a "very unbureaucratic process" (AXA XL Reinsurance, 2013).

3.2. DRM in the USA

In the United States alone in 2014, there were eight weather and climate-related disasters with losses exceeding $1 billion per event. These events resulted in the deaths of 53 people and had significant socio-economic effects on the affected areas, particularly on vulnerable populations including indigenous peoples (Lindell, 2013). The National Disaster Recovery Framework of the Federal EM Agency of the US Department of Homeland Security (FEMA) (National Disaster Recovery Framework, 2016) is a guide that enables effective recovery support for states, tribes, territories and localities affected by a disaster. In addition, it provides a flexible structure that allows responsible disaster recovery structures to work in a unified and collaborative manner. It also focuses on how best to recover, restore and re-establish normal flows for the health, social, economic, natural and ecological fabric of the community and build a more resilient nation. The framework (2016) defines the basic principles of recovery; roles and responsibilities of recovery coordinators and other stakeholders; a coordinating structure that facilitates communication and cooperation between all interested parties; guidelines for pre- and post-disaster recovery planning, and the overall process by which communities can take advantage of opportunities to rebuild stronger, smarter and safer.

The National Preparedness System is an organized process for moving the entire community toward preparedness activities and toward achieving the national disaster preparedness goal. This system integrates efforts in all five areas of disaster preparedness and response: prevention, protection, mitigation, response and recovery, to achieve the nation's security and resilience. The National Disaster Recovery Framework, which is part of the National Preparedness System, describes the strategy and theory of how the entire community should build, maintain and coordinate the use of available resources for response and recovery, identified by the national preparedness objective integrated into other parts of the mission (National Disaster Recovery Framework, 2016).

3.2.1. Disaster mitigation and preparedness

Understanding hazard mitigation in the United States first requires an understanding of how EM activities have historically developed. E. L. Quarantelli, one of the leaders in the sociology of disasters, described the beginnings of disaster research as "almost exclusively supported by US military organizations with very practical concerns about war situations". He notes that these "organized research activities took place from about 1950 to 1965" and that their primary goals were civilian organizing in wartime situations, assuming that "morale is

the key to disaster control" and that "effective disaster control involves ensuring compliance with emergency regulations' and 'reducing and controlling panic reactions'. The federal government took further action during the 1950s by undergoing several reorganizations within the Department of Defense (Drabek & Evans, 2007).

Before and during that time, the federal government was primarily concerned with civil defence, so"private, voluntary agencies such as the American National Red Cross, the Salvation Army, and many others bore the primary responsibility for disaster relief; and state and local governments managed as best they could". Federal aid was available as an absolute last resort through "special relief acts enacted by Congress." However, this system had operated essentially unchanged since 1803, and because of its reactive nature, there were "frequent delays before federal aid reached affected areas, and the nature of the aid was limited to selected purposes" (Drabek & Evans, 2007).

Two interesting notes about the observations in the disaster: first, the basis of the government's EM activities came from a military and national defence perspective. The first "emergencies" in this regard were wars or attacks by foreign invaders. This militaristic approach – managing the disaster as an enemy attack – would significantly shape EM in later years. Second, government activities in the early years were largely reactive. Planning, especially with an emphasis on mitigation, is not mentioned (Slovic & Weber, 2002). Disaster preparedness in the US involves implementing measures to help populations and communities improve preparedness. This is achieved by developing the resources needed for disaster prevention and protection, response and recovery. Improving community preparedness encompasses all disasters, whether earthquakes, cyber-attacks or accidents – the goal is always the same, which is to achieve safety and resilience (National Preparedness Report, 2021). On March 30, 2011, the President of the United States of America issued a Directive related to the preparedness of the nation for disasters (Presidential Policy Directive: National Preparedness, 2011). The goal of this document is to strengthen the resilience of the United States of America through systematic preparation for all potential threats that threaten the nation's security, including terrorism, cyber-attacks, accidents and natural disasters. Preparedness cannot be seen only as a national issue – it must involve a greater number of participants such as all levels of government, the private and non-profit sectors, but also us citizens. What experience has shown is that the results in situations where there is a danger for the entire nation are better if all the actors have a defined role and assume that role. This means that it is not just the government that is responsible for responding (National Preparedness, 2021).

The directive provided for the Ministry of National Security to draft a document related to the national goal of disaster preparedness. The second edition of this document was published in 2015 and defines basic activities in the field of prevention, protection, mitigation, response and recovery in case of disasters. These activities are not exclusive when it comes to all actors participating in disaster activities, but require joint efforts of the entire community (National Preparedness Goal, 2015). The national preparedness system consists of six parts: risk identification and assessment, assessment of requirements system, building and maintaining readiness, planning to make all recognized resources available to relevant actors, resource assessment, checking and improvement.

Of great importance for improving preparedness are exercises and training that help the population to check resources, gaps, strengths, established practices, etc. Examples of

such exercises supported by the US Department of EM are the National Training Program and the National Security Training and Evaluation Program. The first consists of multiple cycles of 2-year exercises that are conducted across countries and aim to test and improve preparedness in all areas of disaster response. Priority is given to strategic priority activities. The second program provides users with a guide that any organization can apply to establish an effective training and evaluation program within its framework by recommendations related to management, design, development of programs, implementation of evaluation, and, subsequently, improvement planning (National Preparedness, 2021).

An example of using technology and smartphones to increase preparedness is an application developed by the US FEMA that is a source of data on all types of disasters. The user of the application can learn from it how to quickly and easily prepare for the upcoming danger. First of all, the application contains territorial exposure to disasters, which means that the user can find what dangers exist in the territory where he is located. The app allows users to automatically connect to a FEMA centre at their point of need. Information on free first aid courses can also be found through the app (FEMA App: Take Charge of Disasters, 2022).

3.2.2. Disaster response and recovery

In the United States, the president declares disasters to free up vital federal resources for state and local governments. US states and territories, as well as tribes, typically respond to disasters and smaller-scale emergencies on their own or with the help of nearby jurisdictions and volunteer groups. But in cases where the scale of the disaster exceeds local capacity, these authorities can appeal for help from Washington. Normally, the federal government only comes in when the governor makes a formal request to the White House. These appeals are generally based on a preliminary damage assessment conducted by a team of local, state and federal officials. Housed within the Department of Homeland Security, the Federal EM Agency (FEMA) is responsible for coordinating Washington's response to disasters on US soil (Labrador & Cheatham, 2020).

The president, after deciding that federal aid is warranted, initiates a physical and financial government response by issuing either a major disaster or a state of emergency declaration. Alternatively, he may deny the claim if he finds that jurisdiction can be recovered independently (Labrador & Cheatham, 2020). Under the Stafford Act, the main law governing federal disaster response, "major disasters" are defined as both natural and man-made events, including "any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm or drought." In addition, serious fires, floods and explosions may require determination. This category generally does not include disease outbreaks. However, following the 2020 novel coronavirus pandemic, President Donald J. Trump declared simultaneous major disasters in all fifty states, an unprecedented move that some experts saw as a violation of Stafford's Law (Labrador & Cheatham, 2020).

The National Disaster Recovery Framework (2016) provides effective recovery support to states, tribes, and territorial and local jurisdictions affected by a disaster. The National Disaster Recovery Framework is the first step toward achieving a shared understanding and shared, integrated perspective to achieve unity of effort and build a more resilient nation

(What a Successful Disaster Recovery Looks Like, 2013). This framework can be understood as a guide published by the US government to promote effective disaster recovery in the United States, especially for large-scale or catastrophic incidents (National Disaster Recovery Framework, 2016).

This framework (2016) provides a comprehensive interagency coordination structure for the recovery phase of incidents covered by the Stafford Act. Elements of the framework may also be used for significant incidents that do not comply with the Stafford Act. The National Disaster Recovery Framework (2016) defines the basic principles of recovery, the roles and responsibilities of recovery coordinators and other stakeholders, a coordination structure that facilitates communication and collaboration among all stakeholders, guidelines for pre- and post-disaster recovery planning, and the overall process by which communities they can take advantage of the opportunities for renewal. After Hurricane Katrina, the United States government passed federal legislation that mandated the creation of a national disaster recovery strategy. FEMA took the lead in developing the NDRF, issuing the first edition in September 2011 and the second edition in June 2016. The National Framework (2016) has been updated to include guidelines for effective recovery by defining roles, responsibilities, coordination and planning among federal, state, local, tribal and territorial jurisdictions.

3.3. DRM in Russia

In Russia in the early days of its existence as a separate country, the disaster response scheme was not so well defined. Some ministries had their disaster services, but their training was highly specialized for specific activities. The legal effectiveness of the former civil defence system was conditioned by several problems, the most serious of which are (DM in the Russian Federation, 2006): the absence of a permanent governing body with sufficient powers and experience to coordinate prevention and response in disasters; the absence of rapid reaction forces; the absence of professional rescuers and the legal basis for disaster prevention and response activities. As is the case in other countries, as well as in Russia, the area of disaster prevention and response must be legally established and regulated. Examples of regulations in this area are the Law on the Protection of Population and Territory from Disasters of Natural and Technological Origin, the Law on Civil Defense, the Law on the Supply of Federal Needs, the Law on State Reserves of Material Assets for Response to Disasters (DM in the Russian Federation, 2006).

As for the institutional framework, against the background of the monstrous number of victims in the Spitak earthquake (1988), the absence of an appropriate system was all too evident. By its decree of December 27, 1990, the Government of the Russian Federation established the Russian Rescue Corps on a par with the State Committee, and in 1994 the Committee was reorganized into the Ministry of Civil Defense, Emergency Situations and Elimination of the Consequences of Disasters (EMERKOM of Russia) (Roffey, 2016). The Ministry of Civil Defense, Emergency Situations and Elimination of the Consequences of Disasters work in cooperation with federal authorities, entity agencies (regions and republics) of the Russian Federation and administrations of local communities. The Ministry of Civil Defence, Emergencies and Disasters is an executive federal body that is responsible for the development and implementation of government policy and legal regulations, control and supervision in the field of civil protection, protection of citizens and territories from natural and man-made

disasters, and protecting water and fire. The President of the Russian Federation supervises and controls the activities of the Ministry of Civil Defense in emergencies and disasters. The first and major step of the Ministry of Civil Defense for Emergency Situations and Disasters was the construction of a modern system for prevention and response to disasters, where the Ministry acted as its central body for organization, direction, coordination, etc. The creators of the new Russian state system of DM (RSDM) guided their activity according to a series of principles considering the current situation (Roffey, 2016).

The principles were as follows (DM in the Russian Federation, 2006): the principle of adhering to a comprehensive approach to the formation of the System, that is, taking into account all possible types of disasters, all stages of their progress, the variety of their effects, all possible methods of their suppression and all resources which are required to take effective actions; it is accepted that the so-called zero risk is impossible; the system was based on the principle of preventive security. The state system of DM includes state bodies of the Russian Federation at all levels, administrations of local communities, various industrial and economic entities and organizations whose activities are related to the problems of protecting the population and territories from disasters, as well as units and facilities. necessary for disaster response. The systems consist of territorial and functional subsystems and have five levels: federal, regional, territorial, local and on-site. The subsystem of territorial prevention and response to disasters is formed in entities (regions and republics) of the Russian Federation for prevention and response to disasters on their territory and consists of units that correspond to the administrative division of these levels. Functional subsystems are formed by federal agencies for the organization of prevention and response to disasters in the respective branches of industry and economy. There are more than thirty such subsystems, for example, the forest fire subsystem based on the Federal Forestry Service, the seismology and earthquake forecasting subsystem based on the Russian Academy of Sciences, and others (DM in the Russian Federation, 2006).

The interdepartmental commission is made up of representatives of federal ministries in the rank of deputy ministers whose responsibility is the problems of protecting the population and territory from disasters. The interdepartmental commission is fully responsible for making decisions. All bodies belonging to the Commission at the federal and local levels are obliged to implement the decisions of the Commission. The system is organized so that responding to disasters is the responsibility of a unit at the local level or a body in the territory affected by the disaster. The response is carried out under the direct command of the relevant disaster commission. When disasters are of such a scale that they exceed the available forces of the lower level of management, the local level can request the help of commissions at a higher level. Assistance is reflected in the coordination of response or the provision of humanitarian aid. Apart from this, help can also be requested at the federal, highest level (DM in the Russian Federation, 2006).

3.3. Disaster mitigation and preparedness

The basis of the national structure for the coordination and implementation of activities in the field of disaster risk reduction is the unique state system of prevention and elimination of emergencies (RSES), which was founded in 1992. The new regulations of the RSES are supported by the decree of the government of the Russian Federation no. 794 of

December 30 "Unified state system for preventing and eliminating emergencies". The state system for the prevention and elimination of emergencies integrates management bodies, the strength and means of federal executive bodies, executive bodies of subjects of the Russian Federation, local administration bodies and organizations authorized to solve problems in the area of population and territory protection in emergencies. Within the framework of the system, activities are carried out on the development and implementation of legal and economic standards in this area, thus ensuring the readiness of the population (NRF at the World Conference on Disaster Reduction, 2004).

The basic activities and goals of the system are the prevention of incidents from disasters and natural disasters; reduction of losses and damages in emergencies; elimination of emergencies, including the execution of emergency rescue operations, as well as other measures to eliminate non-immediate danger to people's lives (NRF at the World Conference on Disaster Reduction, 2004). The unique state system for preventing and eliminating emergencies consists of territorial and functional subsystems and has five levels: federal, regional, territorial, local and facility level. RSES has management bodies at each level; permanent working bodies of control; reserves of financial material and technical resources; systems of communication, notification, information supply, and special educational institutions (NRF at the World Conference on Disaster Reduction, 2004).

Also, research into natural hazards and risks in the territory of the Russian Federation and the former Soviet Union is significant. Disaster research is considered important for risk mitigation as it provides familiarity with the risk, identification of its basic elements, etc. There are many studies of disasters in Russia, however, they were not available outside the borders of the country because there was no translation of them. The aim is to promote such research so that it is available to the wider community. Despite the significant research efforts undertaken by Russian scientists, the methods and results are hardly known among non-Russian researchers and are neglected by the international research community simply because many sources are available only in Russian. One example of such research is the textbook "Fundamentals of Avalanche Science" by Bozinski and Losev (1998), the Russian version originally published in 1987, which was translated only at the initiative of the Swiss Federal Institute for Snow and Avalanche Research in Davos, Switzerland (Fuchs, Shnyparkov, & Jomelli, 2017).

The Russian Federation is systematically working to improve the protection of people and territories from natural or man-made disasters within the framework of the state policy of strengthening the national security of the state. Through the efforts of the Russian Ministry of Civil Protection and Danger, a legislative framework was created in the area of population and territory protection in emergencies, as well as effective management bodies in this area. In addition, Russia's unique state system for prevention and response in emergencies is successfully developing and functioning. In addition, national and sectoral plans for adapting to climate change have been drawn up and approved by normative acts, and work is underway to improve the monitoring and forecasting system for the rapid development of dangerous natural phenomena (Soloviev, 2022).

The Russian Ministry (EMERKOM) is guided by the ideology that it is much cheaper to act preventively and predict or prevent a disaster than to repair its consequences. At the same time, Russia is developing a culture of civilian training, to be sure that they will act properly and timely in emergencies. Ten Russian cities joined this global campaign. As a tool

for assessment, along with methodological recommendations developed based on the All-Russian Research Institute for Civil Defense and Emergency Situations, an adapted list of UN results was used. To successfully implement the mentioned project, it was decided that such a competition would be held regularly (Soloviev, 2022).

The all-Russian comprehensive system of information and warning of the population in places with a large number of people (OKSION) is a Russian complex system for monitoring, reporting and warnings. It was created within the framework of the Federal target program "Risk reduction and mitigation of consequences of natural and man-made disasters in the Russian Federation until 2010". In May 2011, 596 OKSION terminal facilities were built and put into operation in 37 data centres. OKSION represents an organizational and technical system - a combination of hardware and software for processing, transmission and display of audio and video information (Information Center OKSION, Ministry of Civil Defense, Emergencies and Disaster Relief of the Russian Federation). The central and managing body of AUCTION is the Information Center, which organizes the establishment and development of all elements and manages and controls them. In addition, the Center monitors technological development and continuously develops all equipment used by the system, both hardware and software (Information Center OKSION, Ministry of Civil Defense, Emergencies and Disaster Relief of the Russian Federation).

3.3.2. Disaster response and recovery

The Ministry of Civil Defense, Emergencies and Consequences of Natural Disasters of the Russian Federation, also known as the Ministry of Emergency Situations or internationally as EMERKOM (derived from "Ministry of Emergency Situations") is a Russian government agency that oversees civil emergency services in Russia (Roffey, 2016). President Boris Yeltsin established the Ministry on January 10, 1994, although the ministry can be traced back to December 27, 1990, when the Russian Soviet Federative Socialist Republic (RSFSR) established the Russian Rescue Corps and assigned it the mission of rapid emergency response (Roffey, 2016). The history of civil defence services in Russia goes back to the years of the reign of Muscovy and the decree of the Russian Emperor Alexios "Instructions on the rescue of municipalities" of 1649, which officially established the Moscow Municipal Fire Service, the first active fire department in Russia. When Peter the Great was emperor, St. Petersburg got its fire department modelled after the Western practice of the time. By 1863, it was transformed, by order of the Russian Emperor Alexander II, as the first professional fire service in Russia and Eastern Europe. Beginning in 1932, civil defence tasks were performed by local air defence units within the newly created Soviet Air Defense Forces, which were transferred to the NKVD in 1940 (and served with distinction, together with the NKVD Fire Service Command established in 1918, in the Great Patriotic War). In 1960, it was returned to the Ministry of Defense as an official branch of the Soviet Armed Forces (Civil Defense Forces of the Ministry of Defense) and a direct reporting agency, while the MVD retained the fire service (USSR: Reorganization Of Civil Defense, 1965).

After the 1988 Armenian earthquake and the Chornobyl disaster, on July 17, 1990, a directive decision of the Presidium of the Supreme Council of the Russian Socialist Soviet Republic led to the formation of the Russian Rescue Corps, which was finally formed by the Soviet government on December 27, 1990. This date is marked as the official anniversary of

the Ministry (Roffey, 2016). On April 17, 1991, the Presidium of the Supreme Council of Russia appointed Sergei Shoigu as the chairman of the State Committee for Emergency Situations, which succeeded the Russian Red Cross, and on November 9, 1991, the State Committee was merged with the Staff of Civil Defense of the USSR (within the Ministry of Defense) to form the State Committee of the Russian Federation for Civil Defense, Emergency Situations and Liquidation of Natural Disasters and was subordinate to the President of Russia. On January 10, 1994, the State Committee became part of the Government of Russia, and the ministry was renamed the Ministry of Civil Defense, Emergency Situations and Disaster Relief, with Sergei Shoigu as a minister, on January 1, 2002, the Russian State Fire Service, the national fire service, became part of the ministry with 278,000 firefighters, removed from the control of the Ministry of the Interior after 84 years (Roffey, 2016). Due to heavy rainfall, the level of the Amur River has risen to its all-time high of 6.88 meters above the normal level. At that time, the state hydrometeorological service predicted that the water level would rise to 7 meters (Disaster Relief Emergency Fund (DREF) Russian Federation: Floods, 2013).

3.4. DRM in China

While China has made significant progress in establishing disaster response infrastructure, the causes and consequences of various disasters continue to evolve. Along with global climate changes economic progress and increased urbanization, pressure on all resources, ecology and environment is increasing in PR China, which is significantly related to disasters and their consequences (China's Actions for Disaster Prevention and Reduction, 2009). The legal framework and institutional basis for the DRM system in the People's Republic of China are very diverse. This framework consists of various, numerous documents that are regularly updated. In addition, new laws and regulations are passed very often. There is no single law that simultaneously covers prevention, mitigation and recovery from all disasters (Law and Regulation for the Reduction of Risk from Natural Disasters, 2012).

The Emergency Response Law of the People's Republic of China (2007) was adopted at the 29th meeting of the Committee of the Tenth National People's Congress of China, which was held on August 30, 2007. The law normatively regulates areas related to prevention and preparedness for response to disasters, monitoring and early warning, response and rescue activities in emergencies, response after disasters, i.e. recovery and reconstruction, and legal responsibility. The main purpose of the law governing disaster preparedness and response in the People's Republic of China is to provide preventive action that will reduce the likelihood of unwanted events. It is envisaged that the provisions of the law will be applied in all stages of response to disasters: prevention, preparation, monitoring and early warning, response, rescue, rehabilitation and reconstruction. At the same time, we do not mean only cases of natural disasters, but also accidents, incidents related to public health and social security and all other disasters where there is a possibility of serious social losses (Emergency Response Law of the People's Republic of China, 2007).

3.4.1. Mitigation and preparedness

In response to the initiative of the United Nations International Decade for Natural Disaster Reduction, the Chinese government established a committee in 1989, now called the National Committee for Disaster Reduction. An inter-ministerial coordination mechanism

within China's State Council, the committee is responsible for developing key policies and plans for disaster reduction. Housed in the Ministry of Civil Affairs before March 2018, the commission is now housed in the Ministry of EM (China's Actions for Disaster Prevention and Reduction, 2009).

In the three decades since its establishment, the National Disaster Reduction Committee has taken a leading role in drafting comprehensive national disaster reduction plans: the Disaster Reduction Plan of the People's Republic of China (1998–2010), the National Comprehensive Disaster Reduction Plan of the 11th Five-Year Plan (2007–2010), and the National Comprehensive Plan for Disaster Prevention and Mitigation 12th Five-Year Plan (2011–2015). China's disaster prevention and mitigation plans have always focused on reducing disaster mortality and direct economic losses. Since 1991, the country's death rate from disasters and direct economic loss as a percentage of national GDP have shown a clear downward trend, in line with the expected goals of the plans (Disaster Reduction Action Plan of The Peoples Republic of China (2006-2015), 2006).

As a result of its 2008 disaster prevention and mitigation plan, China selected over 12,000 communities across the country to become "demonstration communities" for disaster risk reduction. More than ten years since the beginning of the initiative, spatial analyses suggest that the so-called In-country disaster risk reduction "demonstration communities" are not only effective in combating disasters, but also achieve their intended effect of fostering disaster risk reduction capacity building in surrounding communities (Ghesquiere, Xiao, & Piccio, 2020). Yet the mitigation sector lags behind the response and recovery sectors, despite official rhetoric and policies promoting a "mitigation first" approach. Some of the reasons include inadequate funding for disaster risk reduction at both local and national levels, lack of an integrated system for storing and sharing risk-related information, and lower awareness and coordination of disaster risk reduction among civil society compared to DM. Back in December 2016, the Party and the Government jointly issued a document on system reform, which pointed to an excessive focus on rescue over prevention as one of the main problems of the system that needs improvement (Yue, 2018).

China's inattention to disaster risk reduction is largely the result of two long-standing and interrelated issues: ministries are uncertain about exactly where responsibilities lie and often compete to address disasters. These issues, which have hampered disaster response efforts, led to the creation of a new ministry. Each Chinese ministry has control over a specific economic sector or issue, including response to natural and man-made hazards. This rigid division of duties does not always work well in practice. It also creates grey areas of responsibility where the mandates of ministries intersect (Yue, 2018). Together, these issues have often resulted in poor information sharing, coordination bottlenecks, redundant investments, and wasted resources, impeding effective disaster risk reduction and disaster response (Yue, 2018). To demonstrate the preparedness of the People's Republic of China for various types of disasters to which this country is exposed, an example of various courses and training organized and held by institutions responsible for certain disaster activities can be used. One such course is an advanced course in the field of crises, recovery and transitions. This course was organized by the Humanitarian Policy Group and Tsinghua University School of Public Policy and Management (Zyck, 2013). Disasters that are not only characteristic of the People's Republic of China, but this country shows exceptional vulnerability to them are: earthquakes, floods, droughts, fires, typhoons, storms and pandemics. On average, disasters

cost the PRC 1.6% of the gross domestic product, while, for example, the "costs" of disasters cost the United States 0.57% and the Philippines 0.80% (Zyck, 2013).

Not only did response capacities develop within the borders of the People's Republic of China, but the developments also took on an international character. China's international search and rescue team, which draws on civilian, military and police expertise, was deployed to help in 2003 in Iran (earthquake), in 2004 in Indonesia (tsunami), in 2010 in Haiti (earthquake) and so on (Zyck, 2013). For the preparedness of a country for disasters, technologies can be of great importance and represent a significant advantage for the prevention of potential losses. This means that maps and satellite data created by the National Disaster Reduction Center in China can be made available to countries around the world (Zyck, 2013). One of the major problems of the People's Republic of China concerns documentation - public documents, especially those that are not in Mandarin. Many actors involved in the disaster preparedness and response system in the People's Republic of China are not aware of the experiences of the wider international humanitarian community. The excessive dominance of Western humanitarian institutions had an impact on the People's Republic of China in the sense of not being included in aid bodies, non-governmental organizations, etc. This is also contributed to by the tendency of humanitarian and development bodies to view Chinese aid bodies as unprincipled policies (Zyck, 2013).

3.4.2. Disaster response and recovery

China produced its first multi-year, comprehensive national disaster reduction plan for the period 1998-2010, and since 2007, the country has been preparing comprehensive plans for disaster prevention and mitigation, following the government's five-year planning cycle. These plans have proven to be key to guiding risk reduction interventions. Strikingly, over the years, the shift from reactive to proactive disaster reduction has been prominent in the development of China's disaster risk reduction plans (Ghesquiere, Xiao, & Piccio, 2020). The People's Republic of China established a disaster response system through the State Council. A disaster response plan exists at the state level, and in addition, such plans are adopted and adapted to specific disasters and the demands they pose to the state. Ministries of the State Council adapt disaster response plans to their capacities and those plans must be aligned with the plans at the highest level (Emergency Response Law of the People's Republic of China, 2007).

Once such plans are adopted, their content is not final. The plans are updated from time to time depending on the practice. When there are changes like disasters and the demands, they place on the authorities and the population, then the plan is changed, i.e. its alignment. The State Council establishes the procedure for the adoption and amendment of these plans. As for the content of the plans, they consist of several parts. The plan details the way of command, organization and responsibility in cases of response to disasters, implementation of preventive activities and establishment of early warning mechanisms, as well as operational procedures, ways of recovery, reconstruction and rehabilitation after disasters. When working out all of the above, the starting point is the nature and characteristics of disasters, then the seriousness of the social damage that threatens the state (Emergency Response Law of the People's Republic of China, 2007).

In the organization of the district authorities, risk determination, registration and assessment are carried out to take preventive measures and measures to control the dangers that may arise from natural disasters, accidents and incidents concerning public health. The same applies to the provincial level in the People's Republic of China. When potential sources of disasters have been identified, either at the local or district level, the Law (2007) provides that this information should be immediately made available to the public, by the Emergency Response Law of the People's Republic of China, 2007). Article 21 of the Law (2007) shows the decentralized principle of action in case of disasters. It states that the authorities and competent bodies at the district, city level, town councils and village councils must respond promptly and face any threat that could potentially endanger security. This means that each of these entities establishes a system, controls the application of prescribed preventive and control security measures and promptly removes all early detected risks and problems that may cause harmful consequences.

Law (200) in the People's Republic of China provides for the establishment of training systems at the district level, i.e. training systems for managing emergencies. The role of such centres would be to conduct training and train people to respond in emergencies. In addition to the establishment of training centres, the establishment of rescue teams is also planned. Each entity, by its estimated disaster response resources, considers options and establishes rescue teams accordingly. Such teams can be general in character and composition or specialized for a certain type of activity. It is recommended that such teams consist of adults and that the teams be based on a volunteer approach and participation. All members of specialized disaster response teams must have personal injury insurance and must be equipped with all protective gear and equipment. It is essential in responding to disasters and rescuing vulnerable persons, to reduce the risks that exist for those who participate in those activities (Emergency Response Law of the People's Republic of China, 2007). of all the mentioned entities, the People's Liberation Army of China, the armed police forces of China and militia organizations also participate. These organizations are in charge of carrying out special operations. In addition, they organize and conduct training for special responses to disasters.

All information, plans, conducted training, acquired experience and others should be available to the public. When it comes to transparency in the response to disasters, the media plays an important role. Information important to the public is that which concerns experiences at all levels, specific responses, conducted exercises, conducted rescue actions and the like (Emergency Response Law of the People's Republic of China, 2007). In addition to its strengths in disaster response, the PRC's disaster response infrastructure also has weaknesses, including the problem of coordination between all ministries and other government bodies, as well as agencies at the national, provincial and local levels. Decentralization in the People's Republic of China exists, but it can also have a negative side when a unified and fully coordinated response is needed. Decentralization can lead to unclear boundaries where one body's jurisdiction begins and another body's jurisdiction ends. As can be seen from the above, the level that first responds to disasters and is the most important in that first response is communities. What is a common problem, both in China and internationally, is that the government and experts find it difficult to mobilize resources and focus much of the political attention on strengthening and improving preparedness, even though this brings long-term positive results despite the immediate increased costs. (Zyck, 2013). Currently,

only a small percentage of the budget is reserved at the beginning of each year for natural disasters, which poses a problem when disaster strikes and reconstruction and rehabilitation are necessary (Feng, 2021).

When the anticipated amount of funds is not sufficient, the procedure involves redirecting the funds allocated to other sectors or spending the funds originally reserved for the next year's budget, something that makes long-term planning and development difficult. Catastrophe insurance is one option (Feng, 2021). Insurance adapted to local characteristics. China is increasingly recognizing the importance of disaster insurance to promote rapid recovery after natural disasters (Ghesquiere, Xiao, & Piccio, 2020). Insurance plans enable the transfer and balancing of risks before a disaster occurs and are already well-established in most parts of the world. From 2009 to 2014, 43.6% of damages caused by natural disasters worldwide were covered by insurance (Li, 2016).

Discusion and conclusions

Looking at the analyzed countries, it can be concluded that it is difficult to establish whether the harmful consequences of disasters have a more serious impact on fully developed or less developed and poorer societies. When a disaster occurs in developed societies that are modernized, that have high living standards, developed technologies, specific critical infrastructure and the like, those societies at the time of the disaster suffer great losses if, for example, critical infrastructure is affected and, for example, the use of technology or the functioning of the economy is prevented. Such companies have financial and other opportunities for quick recovery. Poor societies have less preparedness, they do not lose many resources in a disaster, but they remain without the necessities of life and it takes a lot of time for reconstruction and recovery.

Also, analyzing the response to disasters in the mentioned countries, it can be said that in each of them, there is delegation and decentralization, i.e. that the first response lies in the hands of the lowest level of government and the resources available to that level. The response goes to a higher level depending on whether the rescue and protection requirements exceed the lower levels or not. As far as recovery is concerned, it can be said from experience that it is necessary to plan for the occurrence of disasters with the budget. At the same time, it is necessary to provide financial resources not only for response to disasters, resources, equipment and everything needed for response to disasters but also for recovery and reconstruction of what was destroyed. If not adequately planned, there may be sudden and additional costs in situations where the damage is large and the previously planned budget is insufficient. All this suggests that adequate assessment and planning are necessary so that disasters threaten the community and its assets as little as possible. What is noticeably more prevalent in the field of disaster recovery is insurance. Although this type of assistance is still in development, since not all regions of a country are equally developed and able to afford insurance, it represents an effective element when it comes to the recovery of individuals, families, businesses and the like.

Comparing Germany, the USA, Russia and China, it can be concluded that each country has established and regulated a normative legal basis on which the DRM system is further built. In Russia, there is a simple division of disasters into those related to conflicts between states and those originating from sources such as nature and the human factor, and based on

such a simple division, laws have been passed that focus on the terms "defence", "resources" and the like and where there is no large number of laws and by-laws that regulate the area of disaster risk and disaster response. On the other hand, there is the example of China, where a large number of laws and other regulations governing this area have been passed, which are often changed and updated. A problem arises from such a broad regulation, which is reflected in the insufficiently defined division of responsibilities. If we take into account the number of the population of China, but also the fact that it is subject to serious disasters (earthquakes, typhoons, floods, droughts, etc.) and that the consequences are serious, excessive regulation and various insufficiently clear responsibilities can pose a problem in practical operation - when disaster happens.

Within the German normative legal framework, one can see an example of preventive action - a focus on adapting to climate change, which can be considered the cause of certain disasters, but also an example of action by the identified flood risk. In German legislation, great importance is given to the infrastructure and its protection, as well as the financial aspect in cases of disasters. Germany, as a developed country, thinks beyond its borders and response range and establishes a system that will enable mutual assistance and the participation of other countries in joint activities. As part of such an initiative, issues related to business, risk transfer, financial insurance and the like are also considered. What is characteristic of the USA is that there is noticeable progress in the regulation of disaster response - from completely neglecting preventive action and emphasizing only armed threats to action based on experience and lessons learned. An example is the acts that were adopted after disasters that had serious consequences for the USA. With these acts, changes were made in the way of responding and especially in the way of assisting the highest to the local level.

Risk mitigation in each studied country implies good planning of the risk itself, its possible outcomes, but also all the activities that follow when a disaster occurs. The focus is on mitigating the consequences that arise first of all for the population and then for the economy. When it comes to the population, the paper provides interesting examples of how countries prepare the population for response through various pieces of training and exercises - the example of the USA and Germany, which hold training for a response, first aid, evacuation, and the like, and the example of Russia, which organized competitions between cities in the preparedness area, etc. In addition, the use of technology to increase preparedness for response is noticeable in each country. Smart devices, mobile applications, weather alarms and the like have been used in different ways to educate the population, gather information, and conduct surveillance.

When considering responding to disasters, the principle of subsidiarity is represented in the countries in question. In each state, it ranges from the lowest local, provincial and other lower levels. When the demands placed by the disaster on the local level are too great, then resources from a higher level are used. With Germany, the USA, Russia and China, one can observe the respect of one of the priorities of the Hyogo framework for action - and that is the effort to make disaster risk reduction a priority at the national and local level. Each state has an established body (council, ministry, agency, office) at the highest level, whose responsibility is mainly the coordination of activities during disaster response. In the USA, such a body deals with research, education, training, response, assistance and other activities, while in Russia, for example, the Ministry in the event of disasters supervises all civil services.

For recovery after a disaster, it is crucial to adequately assess the risk and determine as closely as possible the potential damage it can bring. The framework for recovery in the USA is based on such estimates. Post-disaster planning is carried out within it. Financial resources are very important in recovery. Reserves and funds must be well planned, as was the case that was shown in the paper on the example of Germany. On the contrary, the example of Russia was given, which had to withdraw the reserves planned for the following year in the current one, since the damage caused in the event of a disaster exceeded all planned financial resources. Noticeable in every country is the existence of disaster insurance. In some countries, it is regulated and recognized as a solution, as is the case in the USA and Germany, while for China it is considered that such a solution would give results, but it has not yet been implemented. By comparing Germany, the USA, China and Russia, conclusions can be drawn about the successful functioning of the system, which is of key importance for the protection of the values of each state. For a system, such as a system that is activated before, during and after disasters, to function, it must be developed on an adequate basis that is adapted to the actual situation and practical operation. Its elements must be connected, and the flow and exchange of information must be organized and functional. In addition, a clear division of responsibility and competence is important when a quick and timely response is required, and it must first of all be normatively regulated. Also, such a system cannot be uniform and unchanging. As the assessed risks on which it is established change, so must it. The system must be comprehensive, ie. it must take into account both the entire state embodied in the government representatives and their institutions and it must also take into account the individual and his possible contribution to responding in emergencies. Established systems cannot be ideal, losses must occur, but it is important that they are developed in such a way that they can preserve the vital interests of states - human lives and that they can enable a quick recovery for the entire society based on good planning of all relevant resources.

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References

- Aleksandrina, M., Budiarti, D., Yu, Z., Pasha, F., & Shaw, R. (2019). Governmental Incentivization for SMEs' Engagement in Disaster Resilience in Southeast Asia. International Journal of Disaster Risk Management, 1(1), 32-50.
- AXA XL Reinsurance. (2013). Disaster Recovery Case Studies Germany Floods 2013.

- Baas, S., Ramasamy, S., DePryck, J. D., & Battista, F. (2008). DRM System Analysis-Guide Book. Rome: Food and Agriculture Organisation Of The United Nations.
- Barjaktarović, L. (2013). Upravljanje rizikom. Beograd: Univerzitet Singidunum.
- Basic Law for the Federal Republic of Germany. (1949). Deutscher Bundestag.
- Bobrowsky, P. T. (2013). Encyclopedia of Natural Hazards. Springer.
- Building the Resilience of Nations and Communities to Disasters. (18-22 January 2005). World Conference of Disaster Reduction.
- China's Actions for Disaster Prevention and Reduction. (2009, May 11). Retrieved from www.reliefweb.int: https://reliefweb.int/report/china/full-text-chinas-actions-disaster-prevention-and-reduction
- Cvetković, V. M., Nikolić, N., Ocal, A., Martinović, J., & Dragašević, A. (2022). A Predictive Model of Pandemic Disaster Fear Caused by Coronavirus (COVID-19): Implications for Decision-Makers. International journal of environmental research and public health, 19(2).
- Cvetković, V. M., Tanasić, J., Ocal, A., Kešetović, Ž., Nikolić, N., & Dragašević, A. (2021). Capacity Development of Local Self-Governments for DRM. International Journal of Environmental Research and Public Health, 18(19).
- Cvetković, V., Öcal, A., & Ivanov, A. (2019). Young adults' fear of disasters: A case study of residents from Turkey, Serbia and Macedonia. International Journal of Disaster Risk Reduction, 35, 101095.
- Disaster Reduction Action Plan of The People's Republic of China (2006-2015). (2006). China National Committee for International Disaster Reduction.
- Disaster Relief Emergency Fund (DREF) Russian Federation: Floods. International Red Cross and Red Crescent Societies (2013).
- DM in the Russian Federation. (2006). Retrieved from Asian Disaster Reduction Center: https://www.adrc.asia/management/RUS/Russian.html
- Domres, B. (2000). The German approach to emergency/DM.
- Drabek, T. E., & Evans, J. (2007). Sociology, Disasters and EM: History, Contributions, and Future Agenda. Department of Sociology and Criminology, University of Denver.
- El-Mougher, M. M. (2022). Level of coordination between the humanitarian and governmental organizations in Gaza Strip and its impact on the humanitarian interventions to the Internally Displaced People (IDPs) following May escalation 2021. *International Journal of Disaster Risk Management, 4*(2), 15-45.
- Emergency Response Law of the People's Republic of China. (2007).

- European Civil Protection and Humanitarian Aid Operations. (2021, August 24). Retrieved from European Commission: https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/national-disaster-management-system/germany_en
- FEMA App: Take Charge of Disasters. (2022, June 30). Retrieved from Ready.gov: https://www.ready.gov/fema-app
- Feng, K. (2021, August 17). Plugging the Hole in China's Disaster Recovery Budget. Retrieved from Sixth Tone: https://www.sixthtone.com/news/1008274/plugging-the-hole-in-chinas-disaster-recovery-budget
- Fuchs, S., Shnyparkov, A., & Jomelli, V. (2017). Editorial to the special issue on natural hazards and risk research in Russia. Springer.
- Ghesquiere, F., Xiao, Y., & Piccio, L. (2020). Learning from experience: Insights from China's progress in DRM. Retrieved from World Bank Blogs: https://blogs.worldbank.org/eastasiapacific/learning-experience-insights-chinas-progress-disaster-risk-management
- Global initiative on DRM. (2022, March 14). Retrieved from Deutsche Gesellschaft für Internationale Zusammenarbeit: https://www.giz.de/en/worldwide/40120.html
- Government Decision On budget allocations from the Reserve Fund for eliminating the consequences of rainstorms accompanied by floods in some regions in the summer of 2013. (2013) sThe Russian Government.
- Gurina, R. R., Plyushchikov, V. V., & Kucher, D. E. (1942-1948). International Engagement of Russian Federation in the Field of Disaster Risk Reduction. International Journal of Civil Engineering and Technology.
- Hurricane Sandy. (2021, October 11). Retrieved from Homeland Security: https://www.dhs.gov/archive/sandy
- Hussaini, A. (2020). Environmental Planning for Disaster Risk Reduction at Kaduna International Airport, Kaduna Nigeria. International Journal of Disaster Risk Management, 2(1), 35-49.
- Information Center OKSION. (n.d.). Retrieved from Ministry of Civil Defence, Emergencies and Disaster Relief of the Russian Federation: https://en.mchs.gov.ru/Ministry/Institutions/information-center-oksion
- Kachanov, S. (2021). Methodology for Building Automated Systems for Monitoring Engineering (Load-Bearing) Structures, and Natural Hazards to Ensure Comprehensive Safety of Buildings and Constructions. International Journal of Disaster Risk Management (IJDRM), 3(2), 1-10.
- Katančević, V. T., & Karović, S. (2016). Identifikovanje opasnosti, procena i praćenje rizika kao oblik ranog upozorenja.

- Kiseleva, I. A., Karamanov, M. V., Korotkov, A. V., Kuznetsov, V. I., & Gasparian, M. S. (2018). Risk management in business: concept, types, evaluation criteria. Espacios.
- Kohlmann, T. (2021). Why Germany's DM works from the bottom to the top. Retrieved from DW: https://www.dw.com/en/why-germanys-disaster-management-works-from-the-bottom-to-the-top/a-58571507
- Labrador, R. C., & Cheatham, A. (2020, August 24). U.S. Disaster Relief at Home and Abroad. Retrieved from Council on Foreign Relations: https://www.cfr.org/backgrounder/us-disaster-relief-home-and-abroad
- Li, M. (2016). Study on raising social fund to redistribute disaster risk with lottery and insurance. Beijing Normal Universty.Beijing
- Lindell, K. M. (2013). Recovery and Reconstruction After Disaster, in Peter T. Borowsky (ed.) Encyclopedia of Natural Hazards. Springer.
- Mirza, M. (2003). Climate change and extreme weather events: can developing countries adapt? Climate Policy 3, pp. 233-248.
- National Disaster Recovery Framework. (2016). Homeland Security.
- National Preparedness Goal. (2015) Washington: Homeland Security.
- National Preparedness Report. (2021). Retrieved from FEMA: https://www.fema.gov/sites/default/files/documents/fema_2021-national-preparedness-report.pdf
- NRF at the World Conference on Disaster Reduction. (2004). TsSI GZ of the Ministry of Emergencies of Russia.
- Öcal, A., Cvetković, V. M., Baytiyeh, H., Tedim, F. M. S., & Zečević, M. (2020). Public reactions to the disaster COVID-19: a comparative study in Italy, Lebanon, Portugal, and Serbia. Geomatics, Natural Hazards and Risk, 11(1), 1864-1885.
- Presidential Policy Directive: National preparedness.(2011) Washington: The White House.
- Reuter, C., Kaufhold, M.-A., Leopold, I., & Knipp, H. (2017). Katwarn, nina, or fema?multi-method study on distribution, use, and public views on crisis apps. Twenty-Fifth European Conference on Information Systems (ECIS).
- Roffey, R. (2016). Russia's EMERCOM: Managing emergencies and political credibility. Total Defense Research Institute.
- Sendai Framework for Disaster Risk Reduction 2015-2030. (2005). Sendai, Japan: World Conference on Disaster Reduction.
- Slovic, P., & Weber, E. (2002). Perception of risk posed by extreme events. Conference Risk Management strategies in an Uncertain World. New York.
- Soloviev, V. (2022, May 21). Official statement of the Russian Federation.

- Ullrich, K. (2021, July 20). THW: Germany's army of volunteers for disaster relief. Retrieved from DW: https://www.dw.com/en/thw-germanys-army-of-volunteers-for-disaster-relief/a-58320465
- Un Nabi Dar, R., & Alam, M. (2020). Understanding Disaster Risk, Its Components and Reduction. International Conference On Building Resilient and Sustainable Societies: Emerging Social and Economic Challenges. New Delhi.
- USSR: Reorganization Of Civil Defense. (1965). In Military Review. University of Illinois.
- What a Successful Disaster Recovery Looks Like. (2013). Retrieved from Business Civic Leadership Center: https://www.uschamberfoundation.org/sites/default/files/publication/ccc/WhatDoesaSuccessfulRecoveryLookLike.pdf
- Yokohama Strategy and Plan of Action for a Safer World, Guidelines for Natural Disaster Prevention, Preparedness and Mitigation. (23-27 May 1994). Yokohama, Japan: World Conference on Natural Disaster Reduction.
- Yue, C. (2018, August 6). A turning point in China's disaster preparedness? Retrieved from China Dialogue: https://chinadialogue.net/en/cities/10768-a-turning-point-in-china-s-disaster-preparedness/
- Zyck, S. A. (2013). Crisis preparedness and response: the Chinese way. Retrieved from ODI: https://odi.org/en/insights/crisis-preparedness-and-response-the-chinese-way/.