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BUILDING ECONOMIC RESILIENCE TO NATURAL HAZARDS – COPING AND ADAPTIVE CAPACITY BASED ON SELECTED EXAMPLES

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ABSTRACT: Natural hazards, such as floods and earthquakes, are becoming more common. Some point out that the frequency of floods may be the result of ongoing climate change. Therefore, efforts are being made to increase resilience, including economic resilience to natural hazards. Building resilience requires the right capacities. This article provides examples of activities that can help to develop coping and adaptation capacities in the event of natural hazards. The two types of capacities, selected for this article, were chosen based on the Australian Natural Disaster Resilience Index. Within the framework of the ability to cope with natural hazards, there are components such as social capital, economic capital, infrastructure and planning, emergency services, social capital, and information and management. For the purpose of the article, infrastructure and planning were selected. When it comes to developing adaptive skills, effective governance and the engagement of local communities are key.

KEYWORDS: adaptive capacity, coping capacity, resilience, economic resilience, natural hazards

Introduction

According to Marin et al. (2021), resilience is one of the four components of risk. The other three components are hazard (the cause of the damage), exposure (to the hazard) and vulnerability (of the exposed population) (Saulnier et al., 2021, p. 151)[1]. Folke (2016) defines resilience as follows: „Resilience reflects the ability of people, communities, societies, and cultures to live and develop with change, with ever-changing environments. It is about cultivating the capacity to sustain development in the face of change, incremental and abrupt, expected and surprising". In turn Nicol & Barnes (2019, p.114) "The concept of 'resilience' has developed to address this increasingly dynamic interplay between social change, economic development and environmental change, encouraging adaptation to change, not the prevention of change".

A review of the literature on the concept "resilience" clearly indicates that references to to the term can be found in various disciplines, ranging from psychology (according to the impact of traumatic experiences on the individual and the family (Flemming & Ledogar, 2008)) to economics (Rose, 2010) or even security, especially energy security (Coaffee, 2008). However, the term first appeared in a publication by C. S. Holling in 1973, who used it to refer to an ecological system. This topic was further explored by the Beijer Institute of the Royal Swedish Academy of Sciences and authors such as Arrow et al. (1995) with reference to ecosystem resilience, or Folke (2006), Walker et al. (2006) with reference to social-ecological systems.

Resilience refers to the ability of a system to withstand and recover from disruption. This system can be, taking into account the authors mentioned above, a society, an economy, a natural environment, or a complex socio-economic system. However, what is crucial is that „resilience is a concept that has advanced in relation to the dynamic development of complex adaptive systems with interactions across temporal and spatial scales" (Folke, 2006).

According to Cutter et al. (2014), resilience is related to preparedness, response, and recovery. As Folke (2006) stated, resilience has two views. The first relates to the ability to absorb shocks and still maintain function. In this matter of things, resilience concerns resilience of what to what and also for whom (see also Cutter, 2016, p. 110; Hassink & Chu, 2024). The second, on the other hand, refers to disruptions that have „the potential to create opportunities to do new things, to innovate and to grow"(Folke, 2006, p. 253). Moreover, in the context of theoretical assumptions, the question arises as to whether resilience should be identified with bouncing back to the same state or condition after the cessation of a threat, shock or crisis, or with a dynamic process involving feedback, adaptive learning and change (Cutter, 2016, pp. 110-111; see also Masik, 2016, p. 457-458; Tóth, 2015, p. 71).

The concept of resilience can be viewed in different ways, depending on the geographical location and the specific context. It can be understood in terms of a region, a city, or the countryside (compare with Hassink & Chu, 2024).

Resilience activities can be undertaken by the state and its agencies (Coaffee, 2008), as well as by "private economic agents" (Briguglio et al.,2009). However, the question that arises is what kind of activities these are. The answer to this question depends on the subject and object of resilience.

As indicated above, the issue of resilience is also the subject of research in the field of economics. Economic resilience can refer to the economy as a whole (on a local or regional level) (EDA, 2025), as well as to individual households or firms (Cardiff University, 2025) and refers to the rapid recovery from a disruption (ZOE, 2025), from shocks (Briguglio et al.,2009) or from disasters (Coaffee, 2008). At this point, it is also worth mentioning the explanations related to the economic crisis. According to A. Roncaglia (2023), an economic crisis can be understood as "a normal phase of the economic cycle; as an unexpected shock that moves (transiently) away from an equilibrium position, considered as the centre of attraction of the economic system; as the result of the systemic instability of market economies, in particular of the game of financial expectations". As a result of an economic crisis or a devastating natural disaster, final expenditure (i.e., GDP consisting of consumption, investment and inventories) decreases (Hashiguchi et al., 2017, p. 8). Therefore, the effects in both cases may be similar. They directly affect production and final demand (see Hashiguchi et al., 2017, p. 8). Remember that natural disasters can also lead to loss of life and health.

1 More specifically Modica and Zoboli (2016) propose „consistent set of relationships among vulnerability, resilience, hazard, risk, damage, and loss as a socio-ecological framework for natural disaster analysis".

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According to A. Rose (2007), economic resilience is linked to "a fundamental economic problem – the efficient allocation of resources – that is "exacerbated in the context of disasters". In turn, Hashiguchi et al. (2017, p.3) define the term as follows: a country's ability to limit economic losses. The economic consequences of disaster must be considered in terms of both the valuation of losses and the expenditure required to restore the situation to its pre-disaster state. The issue of economic resilience in the context of disasters becomes particularly important due to climate change (Shaw & Sharma, 2011; CSIRO, 2020, pp. 18-21).

A relatively substantial number of studies deal with issues relating to "disaster resilience". According to Aldunce et al. (2014): "(...) disaster resilience relates to the capacity of a society to 'bounce back', cope, withstand, resist and recover quickly from the impacts of hazards". Studies on disaster resilience include the following aspects: conceptual roots within the hazard and disaster management field (Parker, 2019), factors influencing disaster resilience (Jang & Wang, 2009), inter alia resilience health system (Luke et al., 2023), financing disaster resilience (Mortimer et al., 2011), etc. However, in the context of the term 'disaster resilience', some inaccuracies should be noted, especially the difference between disaster and hazard in relation to phenomena such as floods, earthquakes, etc. "According to UNDRR (United Nations Office for Disaster Risk Reduction): "A hazard can only become a disaster once it impacts society or the community. A hazard is natural, disasters are not" (UNDRR, 2025)". Therefore, it seems appropriate to introduce the term " economic resilience to natural hazards. Moreover, as A. Rose points out: "Economic resilience is a major way to reduce losses from disasters" (Rose, 2007).

This article builds on the author's considerations in this journal regarding economic resilience to natural hazards and its measurement. Therefore, the theoretical foundations of the concepts of resilience, economic resilience and disaster resilience, as well as the relationships between these terms, will not be repeated here. Instead, this work aims to explore issues related to capacities in the context of building economic resilience to natural hazards. To find out more about the selection of capacities, we can look at the various explanations of resilience and indexes. For instance, de Graaf-van Dinther and Ovink (2021) define climate resilience using five capacities, which are: threshold capacity, coping capacity, recovery capacity, adaptive capacity, and transformative capacity. In turn the Australian Natural Disaster Resilience Index takes into consideration coping capacity and adaptive capacity (Figure 1).

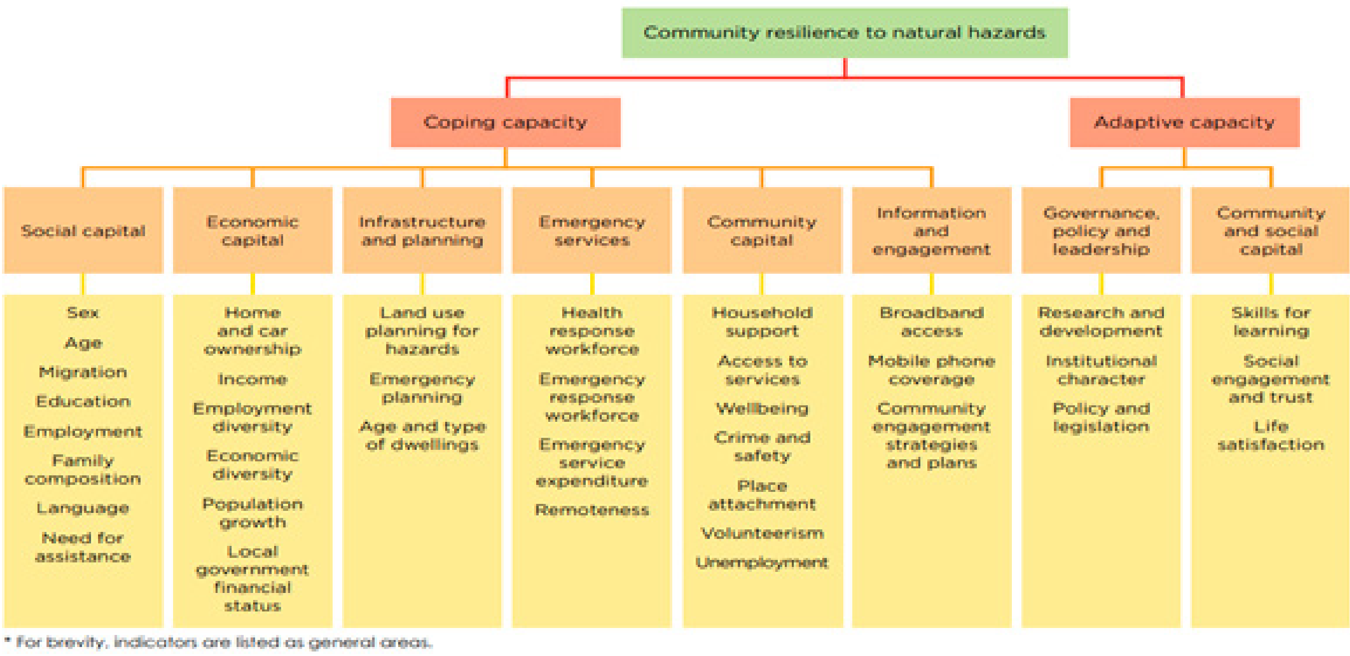

Figure 1. The Structure of the Australian Natural Disaster Resilience Index

Source: Parsons et al., 2017.

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Parsons et al. (2017) present the structure of the Australian Disaster Resilience Index – a measurement to help manage natural disasters. Coping capacity to natural hazards – infrastructure and planning. The Index has a three-tier structure. The first includes the dimensions of coping and adaptive capacity. The second expresses the main elements of coping. And the third includes sets of indicators that measure the status of an issue (Parsons & Morley, 2025). For the purposes of this article, the author has chosen one area of action in the field of coping capacity: infrastructure and planning, and one in the field of adaptive capacity: governance and leadership. In the author's view, these are the most important areas in terms of scope, effectiveness and efficiency. Governments have a range of tools and measures at their disposal to build economic resilience before, during and after a natural hazard event. On the infrastructure side, projects are underway across the network to improve the safety of people and property from natural hazards. However, they require government commitment, significant financial resources and time to build. On the other hand, they offer opportunities for job creation (especially during construction) and for the development of the areas where these infrastructures are built. No less important is the knowledge, research and technological development required to build them.

According to the Intergovernmental Panel on Climate Change, "coping is typically used to refer to ex post actions, while adaptation is normally associated with ex ante actions. This implies that coping capacity also refers to the ability to react to and reduce the adverse effects of experienced hazards, whereas adaptive capacity refers to the ability to anticipate and transform structure, functioning, or organization to better survive hazards"(IPCC, 2012, p. 72).

The development of these capabilities is a process, so the author has adopted, in this paper, the optics of a dynamic view of resilience. Similarly, we will consider economic resilience to natural hazards. Considerations will be based on the following definition of economic resilience to natural hazard: it is the ability of a socio-economic system to withstand a natural hazard, adapt to changing circumstances and to strengthen its ability to respond to potential future natural hazards (Szyja P., 2025).

The following hypothesis was adopted for the purposes of the research paper:

H1. The capacity to cope with natural hazards is developed through increasingly innovative and multifunctional infrastructure solutions, among other things.

H2. The state plays a significant role in developing coping and adaptive capacities.

This paper presents examples of activities designed to develop coping and adaptive capacities from different parts of the world.

Coping capacity to natural hazards – infrastructure and planning

The United Nations Office for Disaster Risk Reduction defines coping capacity as follows: it "is the ability of people, organisations and systems, using available skills and resources, to manage adverse conditions, risk or disasters. The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during disasters or adverse conditions. Coping capacities contribute to the reduction of disaster risks"(UNDRR, 2025). The above definition identifies three key elements of coping capacity that are important in the context of building resilience. In turn, Biling and Madengruber highlight that the aforementioned term refers to: "The level of resources and the manner in which people or organisations use these resources and abilities to face adverse consequences of a disaster" (Biling & Madengruber, 2005).

In this work, we will focus on resources in the form of infrastructure solutions and planning as a component of good management.

The provision of adequate infrastructure related to protection against natural hazards includes the construction of:

1. Fortifications (e.g. dikes), protective covers (e.g. breakwaters).
2. Retention basins.
3. Roads, bridges and earthquake-resistant buildings.
4. Shelters.
5. Infrastructure solutions for water and electricity supply that are resistant to natural hazards.

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Obviously, the type and strength of the natural hazard determine the design of different structures and their protection. The most common of these seem to be solutions to improve safety in the face of floods, earthquakes or tsunamis. Here are some examples from different parts of the world. Examples in Europe include the Thames Barrier and the MOSE floodgate system.

According to the UK, the Thames Barrier spans 520 metres across the River Thames at Woolwich and protects 125 square kilometres of central London from tidal flooding. It consists of 10 steel gates that can be raised into position across the River Thames. When raised, the main gates are as tall as a 5-storey building and as wide as the opening of Tower Bridge. Each main gate weighs 3,300 tonnes. The barrier closes during a storm surge to protect London from sea flooding (Environment Agency, 2025). "Officially opened in 1984, the barrier was designed to protect central London against surges like the one seen in 1953, caused when a deep depression forms to the north of Scotland and progresses across the North Sea towards southern Scandinavia. When these surges coincide with high spring tides, high winds can funnel the water up the Thames Estuary and cause powerful surges" (McGlone, 2023).

Another example in Europe is a tidal floodgate system called MOSE, which was built to protect Venice from flooding. It consists of three systems of gates, each of which closes a gap between barrier islands of the Venetian Lagoon when activated. There are 78 gates. The biggest of the gates weighs 350 tons. Each gate can be operated independently (Engineering.com, 2023).

Solutions from the Netherlands are also worth mentioning, as they are based on measures to protect against flooding before, during and after an event. Pre-flood solutions include inter alia a flood protection system, consisting of robust plastic containers filled with water, which are seamlessly connected by a coupling piece. Another example is a temporary flood system: SLAMdam. Which is based on synthetic EPDM rubber, an ecologically responsible and recyclable material with unique properties and a maintenance-free lifespan in excess of 40 years. The SLAMdam is resistant to UV, ozone, the majority of chemicals, acids and alkalis and is suitable for use in the most varied of weather conditions. In turn, during a flood, one very helpful solution is modular bridging systems. What is significant is that transportation of individual parts can be done with minor transport devices like pick-ups or even on the back of a donkey. Another example is mobile high-capacity pumps. Solutions after flooding are related to the provision of access to water, for example by using s a potable water booster pump, water storage – water buffer bag (Netherlands Water Partnership, 2019).

Infrastructure solutions of an equally impressive nature are also being built in other regions of the world. A very innovative solution has been implemented in Singapore. Its uniqueness lies in "an integrated approach to stormwater management that balances the need for water supply with the need to manage flood risks" (…). Through the "Source-Pathway-Receptor" approach, measures are not only carried out along the Pathway (e.g. through widening and deepening of drains and canals), but also implemented at the Source where stormwater runoff is generated (e.g. through on-site detention) and at the Receptor where floods may occur (e.g. through platform levels, crest protection and flood barriers). This approach is sustainable as stormwater management is addressed at all parts of the drainage system, with building owners and developers playing a role in managing the impact of their developments on flood risks. (NCCS, 2025b).

In addition, most of Singapore is within 15 metres of the Singapore Elevation Datum, and about 30 per cent of our island is less than 5 metres above the Singapore Elevation Datum, which is particularly problematic because the State-city of Singapore is an island with an area of just under 720 km^2. Therefore, there is a need for coastal protection, especially from erosion as a result of climate change (NCCS, 2025a). Currently, around 70 per cent of Singapore's coastline is protected by sea walls and stone embankments. But this is not enough. Singaporeans are implementing modular and multifunctional projects (Ting, 2023). The first example is Marina Barrage, a government-commissioned dam built across the mouth of Marina Channel to create Singapore's 15th reservoir, which serves three objectives: creating a new source of water supply, acting as a tool for flood control, and providing a new lifestyle attraction (Chew, 2019). It was opened in 2008.

A second example is Singapore's 'Long Island' reclamation project, which will combine land, waterfront housing, and leisure amenities with coastal defence in an area spanning 800 hectares. Technical studies are set to begin in 2024 (Mohan, 2023).

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Figure 2. Long Island project

Source: Mohan, 2023.

New York is also implementing flood protection measures. The East Side Coastal Resiliency (ESCR) project targets areas particularly affected by Hurricane Sandy in 2012, which contributed to the deaths of 44 city residents. The $1.45 billion project is scheduled to be completed between 2020 and 2026 and will include a combination of elevated parkland, floodwalls, floodgates and infrastructure improvements across 2.4 miles that will be integrated into the urban fabric, improving waterfront access while providing long-term flood protection (NYC, 2025; Institute for Sustainable Infrastructure, 2022).

There are, of course, more traditional solutions, such as building reservoirs. But they can do more than just protect against floods. Although they can do more than just protect against flooding, the Polish authorities previously planned to build 19 retention reservoirs in central and southern Poland by 2030. One of them, the Bzin reservoir near Skarżysko Kamienna, was to provide not only flood control and water retention, but also energy and even recreational functions (PAP, 2021). In May 2024, an agreement was signed for the development of a programme and spatial concept, together with an environmental impact report for the construction of the Bzin water reservoir in Skarżysko Kamienna. However, among the functions of the reservoir listed on the website of the Regional Water Management Office in Warsaw, recreation is not mentioned (RZGW, 2024).

In addition to these infrastructure solutions, it is worth mentioning others that are characterised by mobility and serve to ensure the safety of the individual. One such example is "noah" an emergency living capsule by Japanese company New Cosmopower, which offers shelter in the event of earthquake or tsunami. "Noah" measures 1.2 meters in diameter and can house up to four adults. Entered through a locking hatch, the cabin has a small lookout window and breathing holes, while its bright yellow colour makes it easy to be located by rescue crews (Designboom, 2011).

Another solution, also from Japan, is to ensure uninterrupted power supply in situations of natural hazards typical of the country. The Savonius Keel & Wind Turbine Darrieus (SKWID) power generation system, developed by Mitsui Ocean Development & Engineering Company (MODEC), is a floating system that shares a vertical floating axis (Ngak, 2013). The idea is to harness wind and wave energy at the same time. The turbine can spin to the left or to the right, so it works regardless of the wind direction. "The wind turbine should sit 47 meters (154 feet) above sea level, with the tidal turbine having a diameter of 15 meters (49 feet). Together, they may be able to generate enough power to provide for approximately 300 households" (Coxworth, 2013).

No less important than these structures and solutions are properly designed structures, such as bridges and public and residential buildings. This is particularly important in earthquake-prone regions. One example is the famous Golden Gate Bridge in San Francisco, completed in 1937. Since 1997, work has been underway in 4 phases, corresponding to different sections of the bridge, to make it resistant to earthquakes of magnitude 7 and above (Savage, 2023). Another example of seismic design, also in San Francisco, is the Transamerica Pyramid, a 260-metre-tall skyscraper whose concrete and steel foundations are designed to move in any earthquake and are almost 16 metres deep (MPA, 2025). Nowadays, shear walls, cross braces, diaphragms, and moment-resisting frames are central to the strengthening of a building in modern seismic areas (BigRentz, 2023).

As we have seen, different types of work are carried out for different types of natural hazards. It must be emphasised that their construction requires knowledge, technology and financial resources. It is equally important to study and monitor phenomena to design structures that can withstand increasingly severe and frequent natural hazards.

Adaptive capacity to natural hazards – governance policy and leadership

As Folke (2016) states: "Resilience thinking is about how periods of gradual changes interact with abrupt changes, and the capacity of people, communities, societies, cultures to adapt or even transform into new development pathways in the face of dynamic change". The aforementioned adaptation activities are related to the development of adaptive capacity. Brooks and Adger (2004) define this as follows: "Adaptive capacity is the property of a system to adjust its characteristics or behaviour, in order to expand its coping range under existing climate variability, or future climate conditions. In practical terms, adaptive capacity is the ability to design and implement effective adaptation strategies, or to react to evolving hazards and stresses so as to reduce the likelihood of the occurrence and/or the magnitude of harmful outcomes resulting from climate-related hazards. The adaptation process requires the capacity to learn from previous experiences to cope with current climate, and to apply these lessons to cope with future climate, including surprises". The issue is explained more succinctly by Jakku and Lyman (2010, p.3): „Adaptive capacity comprises the properties of a system that enable it to modify itself in order to maintain or achieve a desired state in the face of perceived or actual stress". Mentioned terms are defined as follows: modify itself relates to adaptation; and maintain or achieve a desired state relates to coping or transformation. The above definitions illustrate the interdependence of the capacities in question.

Attention should be paid to who develops adaptive capacities and how this is done. The aforementioned emphasised the importance of activities implemented by the government and local communities. Governments have the following instruments at their disposal, which are:

- legal (e.g. legislation on building requirements in seismic areas),
- financial (e.g. funding for disaster victims),
- managerial, i.e. disaster risk management,
- planning and organisational (e.g. disaster management policies or strategies),
- administrative (coordination between public authorities).

It is worth looking at how governments are using some of these instruments in practice, on the basis of a selection of examples. Singapore's development is very impressive. There is no doubt about this, especially when one recalls the commitment of the authorities from the very beginning of independence in 1965 to improve the living conditions of the people and to develop the economy through structural policies that have been properly structured and consistently implemented. Singapore's national water agency (PUB) is taking care of flooding resilience through a holistic approach to stormwater management. This is based on a "Source-Pathway-Receptor" strategy (Figure 3.), which includes infrastructure solutions such as an underground MRT station entrance. The entrance is designed to be higher than the adjacent ground level for flood protection (Md Sham, 2023).

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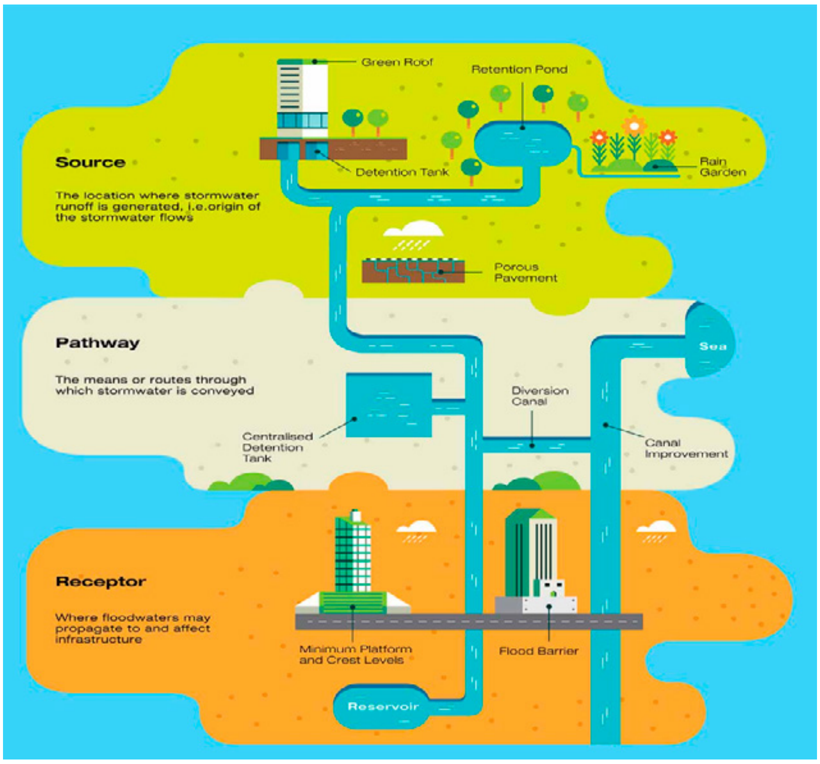

Figure 3. Source-Pathway-Receptor strategy in Singapore
Source: NCCS, 2025b.

Other infrastructure and equipment tools for flood management by PUB are catchment and waterways operation systems, flood response vehicles, portable flood barriers and flood bags, automatic flood barriers, multifunctional solutions (floodplains and rain gardens integrated into Singapore's parks and canals), diversion canals and detention tanks (Md Sham, 2023). PUB has also launched an open Request for Proposal (RFP) to seek innovative, forward-looking solutions to support Singapore's coastal protection and flood management efforts. This grant call is under the applied research pillar of the Coastal Protection and Flood Management Research Programme, established in 2023 (Smart Water Magazine, 2024). The programme consists of four research verticals to develop innovative, sustainable and smart solutions (CDE):

1. Advance coastal science research to deepen understanding of extremities and changes in coastal processes affected by climate change.
2. Enhance capabilities in monitoring, prediction, and digitalisation of Singapore's coastal environment.
3. Develop an effective framework to support integrated and adaptive planning, to strengthen risk management and decision-making processes when prioritising investments made in coastal and flood protection infrastructure.

It is worth highlighting that in April 2020, PUB was appointed the National Coastal Protection Agency to lead and coordinate whole-of-nation efforts to protect Singapore's coastlines (Md Sham, 2023). It is important that Singapore's coastal protection efforts involve not only government agencies but also academia. Coastal Protection and Flood Resilience Institute (CFI) Singapore was launched by the Minister for Sustainability and the Environment on 7 September 2023 as "the first Centre of Excellence in the city-state dedicated to strengthening local capabilities and expertise in coastal protection and flood management research and solution development" (CDE, 2025). It is hosted at the National University of Singapore.

Another interesting example can be found in the United States. The National Coastal Zone Management Program, authorized by the Coastal Zone Management Act of 1972, provides the basis for protecting, restoring, and responsibly developing the nation's diverse coastal communities and resources. 34 states participate in the program. The program is a voluntary partnership between the federal government and U.S. coastal and Great Lakes states and territories. It is administered by the

National Oceanic and Atmospheric Administration. The program includes the following elements (NOAA, 2025):

- protecting natural resources,
- managing development in high-hazard areas,
- giving development priority to coastal-dependent uses,
- providing public access for recreation,
- prioritizing water-dependent uses,
- coordinating state and federal actions.

An interesting example is Japan, which has highly developed institutional structures for disaster management. In this country, the disaster management system is based on a Minister of State for Disaster Management, who is appointed to the Cabinet, and the Disaster Management Bureau, which formulates basic disaster management policy and plans and provides overall coordination in responding to major disasters (Ogata, 2016). In the event of a disaster, the government may establish the Onsite Headquarters for Disaster Management. Likewise, the Prefectural Disaster Management Headquarters and Municipal Disaster Management Headquarters are set up in affected areas, and these administrative units coordinate operations. In March 2015, the Emergency Management Plan for a Nankai Trough Earthquake was established (Ogata, 2016). It is linked to predictions that the 8.0 magnitude earthquake of 1946 – the Nankai Earthquake – could happen again within 30 years (period of megaquake advisory ending, but caution still needed). The Plan for a Nankai Trough Earthquake is made up of five categories in response to large-scale disasters: emergency transportation routes; rescue, first aid, firefighting, etc.; medical; supplies; and fuel (Ogata, 2016). The following organisations take part in the Disaster Response Process: Japan Meteorological Agency, Government, Prefectures and municipalities, residents and companies (Cabinet Office Japan, 2019).

The previous chapter presented, among other things, solutions for earthquake-resistant construction. It is worth recalling the legal solutions that underpin the protection of buildings against earthquakes. The solutions adopted in California in the United States are noteworthy. This state has a set of rules known as the California's "Seismic Codes". "The California Building Standards Code includes rules that are specifically about how to make buildings more earthquake resistant, and these earthquake-specific rules are known as seismic codes". In turn, "seismic ordinances are laws created by local governments to mandate seismic safety standards in addition to California's state seismic codes. They only apply within the city or county where they were passed, and they can't contradict the state codes". What is more, cities and counties in California can issue their own seismic codes (California Residential Mitigation Program, 2025).

Discussion

The selection of examples of coping and adaptive solutions presented is linked to the involvement of the state and its resources. The solutions are also linked to the crisis management strategy. They are based, in the case of the structural solutions, on innovative and often expensive technical solutions. What's more, these solutions are not only designed to reduce the impact of the elements but can also help improve the living conditions of residents regardless of whether a disaster occurs, as in the case of Singapore. It is also important to note that countries such as Singapore and Japan are making investments to increase resilience to flooding associated with rising water levels as a result of climate change. The examples given are mostly from highly developed countries.

Conclusion

It should be noted that economic resilience to natural hazards requires capacities, especially coping and adaptive capacities. In practice, countries that are affected by natural hazards take concrete measures in this regard. First and foremost, they invest in creating appropriate infrastructure solutions characterised by innovation. These solutions support not only the basic functions of protection against hazards and reducing their effects, but also create benefits for society despite the presence of hazards. The development of adaptive capacity as a means of coping with natural hazards requires the involvement of states and communities in terms of legal, organisational and administrative solutions. This addresses the situation of living with frequent threats.

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BUDOWANIE ODPORNOŚCI EKONOMICZNEJ NA ZAGROŻENIA NATURALNE – UMIEJĘTNOŚĆ RADZENIA SOBIE I UMIEJĘTNOŚĆ ADAPTACJI

STRESZCZENIE: Zagrożenia naturalne, takie jak powodzie czy trzęsienia ziemi, stają się coraz bardziej powszechne. Niektórzy wskazują, że częstotliwość występowania powodzi może być wynikiem zachodzących zmian klimatycznych. W związku z tym podejmowane są wysiłki w celu zwiększenia odporności, w tym odporności ekonomicznej w obliczu zagrożeń naturalnych. Budowanie odporności wymaga odpowiednich umiejętności. Niniejszy artykuł prezentuje przykłady działań w zakresie rozwijania umiejętności radzenia sobie i umiejętności adaptacji w obliczu klęsk żywiołowych, wybranych na podstawie Australijskiego Indeksu Odporności na Klęski Żywiołowe. Wybrano dwa rodzaje umiejętności. W ramach radzenia sobie z zagrożeniami naturalnymi wyróżnia się takie komponenty, jak kapitał społeczny, kapitał gospodarczy, infrastruktura i planowanie, służby ratunkowe, kapitał społeczny oraz informacja i zarządzanie. Spośród tych komponentów, na potrzeby artykułu, wybrano infrastrukturę i planowanie. W odniesieniu do umiejętności adaptacji, kluczowe znaczenie ma skuteczne zarządzanie i zaangażowanie społeczności lokalnych.

SŁOWA KLUCZOWE: odporność gospodarcza, umiejętność adaptacji, umiejętność radzenia sobie, zagrożenia naturalne

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