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A Review of Literature on Community Responses to Environmental Crises

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In the light of the environmental crisis caused by unprecedented accelerating interrelated changes accompanied by the most recent ones caused by the COVID-19 pandemic and the humanitarian, refugee, and nuclear crisis provoked by the Russian invasion of Ukraine, contemporary society has been challenged to confront these complex and uncertain times and to recognise a considerable need to respond not only to the environmental crisis but to multiple crises in general.
Another critical question to be answered by contemporary society, which is also a research question in this review, is how an efficient response to crises caused by those accelerating interrelated changes should be organised. Therefore, for the purpose of answering the above research questions, this literature review-based article aims to examine the empirical studies on community responses to environmental crises.
The results of the seventeen analysed articles on community responses to environmental crises and disasters indicate that these responses, given by either members of the directly affected community or by local, regional, or central authorities, were in majority of cases not integrated, as if the collective effort to cope with the emergency were organised simultaneously yet apart. Another observation is that the first respondents on site, who often were also directly affected by an emergency, performed a significant role in response as they had and pooled necessary material and non-material resources, for instance, experience, practical knowledge, and equipment. Based on these findings, the author argues that for future crisis and disaster research, it is essential to examine those cases where there has been indeed an efficient integrated response organised as a result of joint cooperation between all affected actors so that such accounts are incorporated into future disaster preparedness strategies for the organisation of more effective response.

Keywords: community response to environmental crises, disaster preparedness strategies, disaster response

INTRODUCTION

According to United Nations Development Programme 'Special Report: New Threats to Human Security in the Anthropocene' (2022), contemporary society is dealing with the 'development paradox' and humanity stands at a critical point. Despite the fact that, overall, people's lives are longer, healthier, and wealthier, this development has not made people feel more secure. The report shows that approximately six of every seven people worldwide experienced

insecurity long before the outbreak of the COVID-19 pandemic and that this insecurity is increasing: there is a good reason for people to feel insecure as multiple threats such as climate change, environmental degradation, or COVID-19 pandemic have lately become more obvious and assumed new dimensions (UNDP 2022).

In line with another source of the United Nations, 'Our Common Agenda – Report of the Secretary General' (2021), which maps out the next 25 years, extreme disasters such as hot weather, droughts, cyclones or flooding, among others, are unequalled in their extent and time of occurrence; they happen in regions that have never been exposed to such hazards before (UN 2021). On the subject of reinforcing a global response to the climate crisis, 'Special Report on Global Warming of 1.5°C' of the Intergovernmental Panel on Climate Change (2018), confirms that climate has been already affecting human and ecological systems across the globe (IPCC 2018).

Leach (2020), director of the Institute of Development Studies, argues that the decade of the 2010s witnessed an increased political and scientific engagement in environmental problems along with key events such as the Rio+ 20, the United Nations Conference on Sustainable Development in 2012, bringing about an Agreement on Sustainable Development Goals, and later Paris Agreement on Climate Change, both concluded in 2015. In 2018, Special Report on Global Warming of 1.5°C was issued by the Intergovernmental Panel on Climate Change, and the Emissions Gap Report was prepared by United Nations Environment Programme in 2019 (Leach, 2020).

'Our Common Agenda – Report of the Secretary-General' (2021) states that any new planning, preparedness, and response should be somewhat sceptical about the type of crisis for which measures should be introduced as it is difficult to predict what kind of extreme contingency will follow. Therefore, in order to tackle complex global crises, an Emergency Platform has been created which is to be activated automatically in crises of a sufficient scale and extent and in any type or nature of the crisis. The Platform summons, among others, the leaders of the Member States, the United Nations system, global financial organisations, actors on regional level, civil society, private sector and industry professionals as well as researchers and other specialists. At the outset, the governments have been invited to perform exercises in listening and envisaging the future in order to establish better solutions for listening to people whom they serve (UN 2021).

In view of those complex and uncertain times unprecedented in human history, the author argues that it is vital to deepen the understanding of the role and highlight the importance of the concept of community response to crises. Thus, this literature review-based article aims to examine empirical studies on community responses to environmental crises by posing a research question as to what kind of responses to crises were made, what kind of actors responded, and, foremost, if there is a common pattern in the way the response was organised. For this purpose, a variety of empirical studies analysing responses to environmental crises and disasters made by diverse actors in different geographical regions have been reviewed. An additional question whether these findings could be incorporated into future disaster preparedness strategies for the organisation of more effective response has also been considered.

THE THEORETICAL FRAMEWORK

The aim of this review was to examine literature bringing into focus the organisation of response to environmental crises. Since crises in general are increasingly manifesting themselves

across boundaries and systems (Boin 2009; Quantarelli et al. 2006; Wachtendorf 2009; Olofsson 2011), extending spheres on social, physical and organisational level, a more open and versatile approach to crisis management and the organisation of response to potential large-scale crises and disasters are needed (Kendra 2003, cited in Olofsson 2011).

Natural or other disasters often demand international intervention from major agencies, such as the International Red Cross and similar organisations (Rosenthal, Kouzmin 1977). The COVID-19 pandemic has given a lesson about the role of the government and administration as a source of reliable guidance, specifically in times of emergency (UN 2021). Various actors and agencies may actually act differently during a crisis (Rosenthal, Kouzmin 1977). Linnell (2013) notes that instead of risks and hazards people might face, attention should be given to people and their agency (Linnell 2013). The claim that people should be in focus is congruent with the statement by the UN Secretary-General that people's agency both enables and promotes protection (UNDP 2022). Linnell (2013) also highlights the efficacy of such established networks as family, workplace, associations, organisations, congregations, to name a few, as people opt for joining combined efforts taken within networks, they usually are part of and are familiar with rather than to collaborate in networks created specifically for the sake of emergency and disaster management. In this way, collaboration between different actors should be facilitated before the emergency and not necessarily focus on the emergency itself. This is in line with the claim of the Center for Disaster Philanthropy (2022) that people and organisations belonging to communities and groups in specific fields yet with no experience in crisis management might possess competencies and material or non-material resources vital in disaster preparedness and response (Center for Disaster Philanthropy 2022). Linnell (2013) recognises that many of the already established networks who respond to needs on a collective level could be taken into account as important actors in the organisation of the response to crisis.

Following the Center for Disaster Philanthropy (2022), many of disasters such as typhoons, earthquakes, floods, or hurricanes, which affect large numbers of people are difficult to predict. Yet the disaster response of the community can reduce their impact as it possesses diverse tools, such as preventive work, which continues during the whole long period of recovery and reconstruction, all being part of the 'disaster life cycle' (Center for Disaster Philanthropy 2022). According to the same source, the response to disaster, also known as 'disaster relief' that is part of the disaster life cycle, is reactive in nature and that often the discussion about disasters takes place only after a community is hit by a disaster. Yet for the purpose of a more effective response, the discussion about disaster preparedness, response, and recovery should be held prior to disaster. In an ideal scenario, such a response involves adopting and following the disaster preparedness strategy planned in advance (Center for Disaster Philanthropy 2022). Similarly, Oloffson (2011) indicates 'preventive work' and reaching the affected population at the time of the disaster as the most important feature of disaster preparedness (e.g., James et al. 2007; Quinn 2008; Sikisch 1995; Smith 1990 cited in Olofsson 2011). Therefore, planning of disaster preparedness has to be flexible and tailored to both the emergency event and the community hit by disaster. Unfortunately, despite the findings of scientific research revealing that communication adjusted to the affected population brings more effect, many actors in charge of crisis management continue to employ a uniform strategy (e.g., Kar et al. 2001; Lindell, Perry 2004; Quinn et al. 2008; Vaughan, Tinker 2009 cited in Olofsson 2011). Hence actors in charge of crisis management are challenged to enhance preparedness and response to unanticipated future crises (e.g., Boin 2009; Sundelius et al. 2001; Hart et al.

2001 cited in Olofsson 2011). Drabek et al. (2007) put forward the following recommendations: a complex approach which takes into account all hazards is the key (Drabek, Hoetmer 1991); preparing contingency plans is a constant process, not a one-off task to be performed and removed from the list (Dynes et al. 1972); strategies, priorities, and programme activities should be based on social science instead of 'myths' (Quantarelli, Dynes 1972); if contingency planning is to be useful in guiding human response, it should done by those who will follow it (Dynes, Drabek 1994); 'theoretical models' grounded in resource rather than authority are necessary for the organisation of response to crisis (Dynes 1994; Neal, Phillips 1995; Drabek 2003 cited in Drabek 2007).

METHODOLOGY

For the purpose of systematic literature review aiming to examine responses to environmental crises, first an overview of empirical studies analysing communities' responses to environmental crises and disasters was made by accessing the most prominent databases, Scopus and Web of Science. To refine the search for empirical studies, the following keywords were applied: 'environmental crisis', 'community response to', 'community response to environmental crisis', and 'community response to environmental crises'. The search was narrowed to a time frame of ten years, from 2012 to 2022. The author read all the abstracts and keywords. In cases where abstracts did not prove to be very informative, the author read full texts. The number of articles decreased when duplicates were identified. As a result of the keyword search, 41 articles in total were sampled from data bases: 31 articles from Scopus and ten from Web of Science. An argument by Leach (2020) about increased awareness of environmental issues fostered by science and politics in the 2010s, which was the decade of enormous scientific and political efforts and impact justified the choice of this specific period of time. Following the argumentation used by Leach (2020), to the effect that citizen actions remain key, the author focused on the concept of community response to environmental crises while developing keywords. The rationale for keyword search was based on Oxford Reference (2022) definition of environmental crisis described as the sum of environmental problems humanity faces today, including among others not only global warming […] but also new dimensions such as emerging threats and the global nature […] of those problems (Oxford Reference 2022).

INCLUSION CRITERIA

In the process of selecting the documents for further analysis, many chosen articles did not fulfil the established criteria as they lacked empirical evidence due to the following inclusion criteria applied in the selection process: (1) publications about community resilience and community response to environmental crises and disasters applying social science methodology, (2) articles written in English, and (3) article type: empirical research articles.

EXCLUSION CRITERIA

The following exclusion criteria were applied in the selection process: (1) non-academic journals, (2) articles in other languages than English, and (3) article type (Figure).

The study is subject to two limitations: (1) the selected study sample covered the timeframe of ten years from 2012 to 2022 and (2) a limited selection of the keywords.

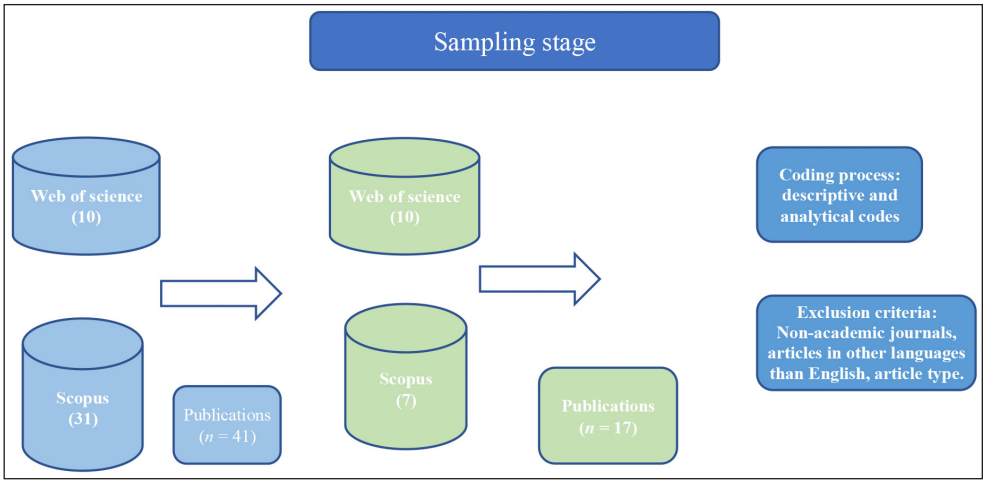

Figure. The sampling stage

Source: developed by the author (2022).

RESULTS

The analytical screening process resulted in 17 articles, which were incorporated in the final review: ten from Web of Science and seven from Scopus. Since the research question of this review is how and by whom the response to crises is made and whether a common pattern can be found in the way those responses were organised, descriptive and analytical codes (type of crisis, type of region, type of actor and type of response) were developed and defined in the process of text analysis

The following codes were identified for types of crises:

- natural disaster – flood, hurricane, volcanic eruption, cyclone (7) (Aniah, Yelfaanibe 2018; De Bélizal et al. 2012; Hidayat et al. 2022; Joseph et al. 2018, Anand; Sanchayan et al. 2021; Shaamhula et al. 2021; Sou, Webber 2019),
- environmental planning and management crisis caused by lack of access to basic infrastructure (3) (Brandful et al. 2020; Shapira et al. 2021; Veisi et al. 2020),
- biosecurity crisis stemming from the spread of harmful organisms (1) (Ram, 2020),
- technological crisis arising from toxic pollution (3), (Clarke, Mayer 2017; Fraser et al. 2020; Johnston et al. 2019),
- climatological crisis caused by drought (3) (Gómez-Baggethun et al. 2012; Mullin, Rubado 2017; Savari et al. 2021).

Other codes emerged as well: inhabitants of affected areas (17) government, state/local authorities/crisis management teams (13), international and domestic NGOs (3), private sector companies (1), academia (1), media (2), religious organisations/missionary groups (4), volunteers (1), as well as types of response codes such as: government's proactive response, government' reactive response, community involvement (Table 1) and type of community rural, crisis-prone/nearest to hazard, peri-urban/suburban (Table 2). Types of regions were coded as: Africa (3), Asia (8), Europe (1), United States of America (4), Oceania (1).

Table 1. **Results of the coding: type of response**

Type of response	Number of articles	Examples
Government's proactive response	6	– teaching about and engaging citizens to foster sustainable development (the case of Japanese municipalities) (Fraser et al. 2020) – observing and reporting the volcanic activity, preparing emergency logistics and public dissemination about volcanic hazards (the case of Kelut volcano eruption) (De Bélizal et al. 2012)
Government's reactive response	9	– carrying out household needs assessments and providing financial support (the case of hurricane Maria and Irma in Puerto Rico) (Sue, Weber 2019) – declaring the outbreak of fruit fly and creating risk zones (the case of fruit fly outbreak in Auckland New Zealand) (Ram 2020)
Community involvement	14	– community developed coping strategies and community-led anti-aquaculture movement to ensure food security for their household (the case of Cyclone Amphan in Bangladesh during COVID-19 pandemic (Sanchayan et al. 2021) – first responders effectively utilizing their social capacities and participating in rescue operations (the case of Kerala flood) (Joseph et al. 2020)

Source: developed by the author (2022).

Table 2. **Results of the coding – type of community**

Type of community	Number of articles	Example
Rural	10	Small and rural natural resource community of Apalachicola, Florida (Clarke, Mayer 2018); Communities heavily damaged by severe floods rural settlements, especially countrywide worst affected and most vulnerable, whose livelihood depends on local crops and resources (Shaamhula et al. 2021)
Nearest to Hazard	5	Community near industrial lead sources-smelter. Poor vulnerable, low-income communities of colour-Latinx. Neighbourhoods surrounding the facility in Los Angeles (Johnston et al. 2019) Communities nearest to the volcanic hazards in the towns of Kediri, Blitar, and Malang in Indonesia (De Bélzial et al. 2011)
Peri-Urban/ Suburban	4	Inner city suburb of Grey Lynn, Auckland (Ram 2021); a seaside community of Ingenio in Toa Baja municipality in a peri-urban area hugely damaged by the Hurricane Maria disaster (Sou, Webber 2019)
Urban	1	Yokohama City, the largest municipality outside Tokyo, Japan (Fraser et al. 2020)

Source: developed by the author (2022).

Findings imply that in the case of Japan, Indonesia, Iran, Israel, and Ghana, government's proactive response was in the form of community awareness activities such as consulting the issue with citizens and engaging and mobilising community in crisis mitigation. Preventing measures such as sustainable development and disaster education as well as community emergency preparedness were also adopted. For instance, a Japanese city purchased forests nearby elementary schools so as the educational institutions may use this area in teaching about sustainable development (Fraser et al. 2020).

Whereas in the case of Namibia, Puerto Rico, Iran, Texas, New Zealand, Indonesia and Kerala government response to crisis was reactive and involved, among others, the declaration of disaster followed by an emergency and evacuation orders as well as the execution of monitoring programs. In the aftermath household needs assessment were carried out, financial support and compensations checks were provided and recovery programs were implemented. For instance, in the case of efundja flooding in Namibia, governmental response focused on the distribution of relief aid and provision of temporary shelter (Shaamhula et al. 2021).

Findings reveal that community involvement encompassed activities and coping strategies such as participation in rescue missions, donations, and adaptation to shortages. The response also comprised protection of cultural ties and traditions, trust in leadership, following restrictions, complying to rules and regulations as well as establishing community-led movements. For example, in the case of California, a community living near a lead-battery smelter and constantly exposed to heavy metal toxicity, started expanding awareness by door-to-door information sharing with an innovative infographic campaign to build community environmental health literacy (Johnston et al. 2019).

Results indicate that the communities nearest to hazard and rural communities were mostly affected by crisis. While developing coping strategies, despite geographical vulnerability, lack of basic infrastructure, damage and disruption caused by a disaster, those communities were resilient, aware, self-sufficient, and self-reliant. For example, in the case of oil spill in Florida, the affected members of the community underlined the role of experience with harsh weather and talked about themselves as 'fighters' and 'survivors' who had learned how to cope with storms as with regular events (Clarke, Mayer 2018). In the case of Kelut volcano eruption, the poor and vulnerable fishermen community reached out to the worst-affected populations by using their private money to transport their boats to reach areas hit by the disaster, which were far away from their homes (De Bélzial et al. 2011).

Results show that the response to crises, especially on the onset, was often grassroot, spontaneous and bottom-up, and organised by inhabitants of the affected area, mostly first responders. Other actors responding to crises, though in minority, were volunteers, members of academia, and non-profit and religious organisations.

DISCUSSION

It is reasonable to suggest that although the articles reviewed covered different crisis, region and response to crises, the organisation of the response in each case seems similar. In line with Linnell (2013), the inhabitants of affected areas identified in this review were the first to react and the most responsive actors in providing aid and rescue, as, first, they were already on site, secondly, they had the necessary resources to cope with the emergency such as for example the equipment, but above of all, they had knowledge and hands-on experience of living in the areas hit by the disaster. Response was also organised by networks such as relatives, families, and neighbours among others mobilizing available resources. A similar suggestion (that people and organisations belonging to communities and groups in specific fields yet with no experience in crisis management might possess competencies, material or non-material resources vital in disaster preparedness, and response) was made by the Center for Disaster Philanthropy (2022).

In an attempt to address the question of how an effective response to crises caused by accelerating climate changes should be organised and to identify factors responsible for this

effectiveness, the author identified several factors influencing the effective response to environmental crises. For instance, in the case of the flood in Kerala, it was the resilience and cohesiveness of local population resulting in a spontaneous apt response made by a community of first responders, despite being vulnerable and hampered by limited physical and financial resources. In the case of the municipalities reducing greenhouse emissions in Japan, it was engagement of and consultation with local communities in implementing tailored crisis mitigation strategies. In the case of California, the response was in the form of grass-root level activities to expand awareness, undertaken by a community exposed to toxic pollution. In the Gamalama volcano eruption in Indonesia, the response consisted of intensive communication with regional disaster management authorities, disaster education and technical training, as well as voluntary activity of the inhabitants. In the case of biosecurity crisis in New Zealand, it was a legal framework for biosecurity and complying with those rules and regulations, and in Florida the implementation of formal recovery programmes after the oil spill.

In accord with Renn (2022), adequate crisis communication is fundamental in crisis management but it can be accomplished once communicators get acquainted with human response patterns following crisis. Renn (2022) also claims that participation of the affected population in trainings and simulations is very effective in this respect (Renn 2022).

The author of the review observed an emerging common pattern of response to be further explored and assumably incorporated in future disaster preparedness strategies for the organisation of a more effective response.

In time of emergency, there are actors who take efforts to respond to a crisis. There are also material and non-material resources to be mobilised, accessed, and used. What is absent is the dialogue stimulating the process of sharing knowledge about actors and resources, especially about the actors most vulnerable and exposed to future crises.

Following the United Nations (2021) appeal to governments to establish better solutions for listening to people whom they serve, the author holds that the dialogue is a relevant and crucial factor in the organisation of a more effective response to crises and that it should be continually explored in future disaster and preparedness research.

CONCLUSIONS

The author argues that it is crucial for further research in this area to focus on cases of the role of actors involved in response, specifically first responders from vulnerable communities, as well as the cases of responses being a joint effort made by all actors involved in organising such a response. The author believes that both cases may be a vital pool of experiential knowledge beneficial for the organisation of a more effective response in the future.

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Literatūros apie bendruomenių atsaką į ekologines krizes apžvalga

Santrauka

Beprecedenčių spartėjančių, tarpusavyje susijusių pokyčių, tokių kaip klimato krizė, COVID-19 pandemija, taip pat humanitarinė ir pabėgėlių krizė, kurią sukėlė Rusijos invazija į Ukrainą, kontekstas kelia nemažai iššūkių šiuolaikinei visuomenei pripažinti, kad būtina reaguoti ne tik į aplinkos krizę, bet ir į daugybę krizių apskritai.

Kitas esminis klausimas, į kurį turi atsakyti šiuolaikinė visuomenė ir kuris yra šios apžvalgos tiriamasis klausimas – kaip turėtų būti organizuojamas veiksmingas atsakas į nelaimes ir krizes, kurias sukelia šie spartėjantys, tarpusavyje susiję pokyčiai. Todėl šiame literatūros apžvalga pagrįstame straipsnyje siekiama išnagrinėti empirinius bendruomenių reagavimo į ekologines nelaimes ir krizes tyrimus. Naudojant raktažodžius, buvo atrinkta 17 straipsnių.

Straipsnių apie bendruomenės atsaką į aplinkos nelaimes ir krizes analizės rezultatai rodo, kad nukentėjusių bendruomenių narių arba vietos, regioninės ar valdžios institucijų atsakas daugeliu atvejų nebuvo integruotas ir trūko kolektyvinių pastangų susidoroti su ekstremaliąja situacija.

Taip pat pastebėta, kad pirmieji vietoje reaguojantys asmenys, kurie taip pat dažniausiai tiesiogiai nukentėjo nuo ekstremaliojo įvykio, atliko labai svarbų vaidmenį reaguojant į nelaimes ir ekstremaliąsias situacijas, nes jie turėjo ir sutelkė būtinus materialinius ir nematerialinius išteklius, pavyzdžiui, patirtį, praktines žinias ir įrangą. Tolesniuose tyrimuose būtina išnagrinėti tuos atvejus, kai iš tiesų buvo veiksmingai integruotai reaguojama bendradarbiaujant visiems nukentėjusiems subjektams, kad tokie duomenys ir patirtys būtų įtraukti į pasirengimo nelaimėms ateityje strategijas, siekiant veiksmingesnio reagavimo į krizes.

Raktažodžiai: bendruomenės atsakas į ekologines nelaimes ir krizes, pasirengimo nelaimėms strategijos, reagavimas į nelaimes