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Fostering civic participation and collective actions for disaster risk reduction: Insights from Aotearoa New Zealand case studies

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ABSTRACT

This paper explores how community members collaborate with emergency management organizations in the pre-disaster stage and engage in collective actions for reducing disaster risks in their communities. Utilizing four qualitative case studies from New Zealand, we examined how local groups interested in reducing community level disaster risks form, the nature of their collective actions and collaboration with emergency management organizations, their facilitators and barriers and the outcomes of the processes. The findings suggest that people's involvement, collaboration, and collective action in the pre-disaster stage entails participating in programmes administered by emergency management organizations through diverse community groups, informal emergency response teams, and specialized volunteer groups. The two primary goals are to have a group of people ready to provide immediate support in an event by maintaining community response teams and making prior arrangements that support people to spontaneously volunteer in an emergency, through community emergency hub approach. These groups engage in tasks such as creating community response plans, maintaining resources, and fostering communication and social capital. The factors facilitating these efforts include hazard awareness, community conversations, institutional support and active DRR organizations, clear objectives, skilled facilitators, and ensuring community solutions are supported. However, currently, community involvement in the pre-disaster stage is narrowly focused on improving response outcomes, lacking a broader perspective of addressing developmental and environmental issues that create risks. They are also rooted in the idea of a solidaristic community and rely on social capital. We discuss the implications of the current practices and the way forward.

1. Introduction

Aotearoa New Zealand (NZ) is exposed to a range of natural hazards and has witnessed multiple devastating disasters in the past [1]. Given the disaster history, identifying ways to improve disaster management has always been a government priority. In 2019, New Zealand released the National Disaster Resilience Strategy which outlines the vision and goals of emergency management for the next 10 years in New Zealand (Ministry of Civil Defence & Emergency Management, 2019). Under its third priority, it emphasizes the need for collective actions to improve disaster resilience and explicitly states that "collective action, by, with and for the individuals,

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families/whānau, and groups who live in communities" is required to build a disaster resilient nation (Ministry of Civil Defence & Emergency Management, 2019, p. 31). The existing regulatory framework, guided by the 2002 Civil Defence Emergency Management Act, the Resource Management Act, 1991 and the Local Government Act 2002, also highlight the need to involve communities in disaster risk reduction.

To promote collective actions, we need to understand what do we mean by collective action, how does it emerge, what are their nature and forms, what activities are happening through collective actions and what are their outcomes? Answering these questions are necessary for developing programmes and guidelines that are effective in supporting, promoting, and sustaining the collective actions necessary to manage disaster risks.

Reflecting on academic literature, we find that actions to reduce disaster risks can either be at an individual or a collective level. For example, being aware of evacuation routes, knowing recommended protective behaviours, and developing a household evacuation plan are individual level actions. Participating in community consultations, collaboratively developing community response plans, and getting involved in community response teams are community or collective level actions [2,3]. Contemporary researchers acknowledge that focusing on preparedness and mitigation efforts at the individual level may not suffice to reduce disaster risks [4,5]. It is crucial for communities, rather than just individual households, to have the capability to collaboratively mobilize resources, interact with different stakeholders, participate in the decision-making processes, strategize on enhancing preparedness for future disasters and develop the capacities of the community at large [6]. Community level actions are effective in building resilience even among the most vulnerable groups [7], enable greater public participation in decision making and help in supporting government actions when there are resource deficits [8,9]. Thus, research highlights the need to encourage collective actions and invest time and efforts in supporting them.

While a general notion of collective action exists, there is still a need to develop the concept theoretically and establish accepted practices, common terminology, and basic principles [10]. In this context, the paper explores: i) the concept of collective action and its forms in the pre-disaster stage; ii) the factors influencing emergence and sustenance of collective actions; and iii) the activities and resulting outcomes.

2. Literature review

2.1. Conceptualizing collective action and defining key terms

Disaster risk reduction (DRR) involves reducing disaster risks by systematically acting on the elements that cause disasters, including reducing vulnerabilities and exposure of people, improving preparedness to adverse events, and undertaking activities that fit within the broader context of sustainable development [11]. Communities refer to groups of people who share same geographic location, demographic characteristics (gender, race etc.) or interests (leisure activities, common interests etc.), from which people derive a sense of identity and belonging [12] and who are more inclined to interact, establish connections, and share both material and immaterial resources [13].

Collective action for DRR can be considered as the "joint activities by a wide group of actors on the basis of mutual interest" for improving the condition and well-being of the community by reducing disaster risks ([14], p. 161). This can include volunteering in community preparedness initiatives, engaging in consultations and development of community response plans, collaborative actions among landowners for hazard mitigation etc. [2,15–17]. Civic participation refers to the activities that individuals undertake beyond their immediate responsibilities to support the well-being of the community [18]. Thus, civic participation at the individual level to address shared concerns or goals, leads to collective action [19,20].

2.2. Forms of civic participation and collective action

The concept of community participation in disasters emerged in 1970s broadly referring to community involvement in disaster management. However, over the decades the term has expanded to signify a wide range of concepts, forms, and modalities.

Disaster preparedness literature views participation as the ongoing two-way dialogue between experts, and community members about risks and preparedness through which people's engagement in individual or family level preparedness activities can be improved [21–23]. The emphasis, however, remains on individual actions and outcomes, which collectively enhance the community's overall preparedness [24].

Disaster and development literature considers participation as the involvement of people in collectively addressing hazard risks through community-based disaster management (CBDM, CBDRR, CBDRM) practices [25,26]. It is rooted in concepts of community self-help, empowerment, and self-determination by local people [27]. At the community level this typically involves local people forming groups (like community disaster management teams), and working in close collaboration with civil defence agencies and different stakeholders to identify hazard risks, strengthen the community capacity, ensure emergency response plans are in place, address developmental concerns that cause community level vulnerabilities etc. [28–31].

Studies drawing from the environmental and ecological tradition also follow the above concept of participation as collective actions by groups of people [32,33]. The goals, however, are targeted towards mitigating hazard risks through decentralized environmental risk governance and management actions, such as implementing fire management strategies [16], catchment monitoring and maintenance [8], long term environmental stewardship [17] etc. The degree of organization, and institutionalization of these groups vary, ranging from informal groups of interested people to formally recognized, trained groups with legal mandate to implement community level risk reduction initiatives [34–37].

In disaster resilience literature, participation signifies both the forms mentioned above. The resilience literature also recognizes that individuals are socially situated, and social networks and connections formed in the pre-disaster stage help in quickly securing information, support and mobilizing resources to respond after an event [38–40]. As such, participation in the community groups that are not directly engaging in emergency management activities but contribute towards social networks, nurture a sense of belonging, collective efficacy beliefs, promote social learning and improve social capital becomes relevant, e.g. participation in timebanks, food-banks and other community initiatives [41–43]. The conceptual vagueness of the term participation, however means that participation in resilience can imply "anaemic forms … that are designed to stimulate public awareness" to decentralized participatory governance that is "legitimised and resourced" ([44], pp. 302, 311) – which sometimes leads to conflicting perspectives on what participation looks like, what it should achieve and limits its potential [36,45,46].

In New Zealand, community participation for reducing disaster risks has traditionally focused on individual preparedness actions with the assumption that widespread adoption of preparedness measures will improve the overall community preparedness and contribute to resilience [4,24]. However, the Christchurch earthquake and subsequent emergencies demonstrated that the social networks and community groups in a locality play a crucial role in providing immediate information and resources, as well as in mobilizing support for those affected [42]. It highlighted that effective disaster response requires considerations beyond individual preparedness; it needs to strengthen community groups and social networks to enable collective actions during emergencies. To achieve this, community groups and stakeholders are increasingly collaborating with emergency management agencies in the pre-disaster stage, focusing on enhancing their capacity and capability to support their communities during emergencies and multiple initiatives are currently underway [47–50]. However, we still lack a comprehensive understanding of these initiatives. As such, the first research question investigates:

RQ1. What are the nature and form of collective action and civic participation in the pre-disaster stage?

2.3. Factors fostering civic participation and collective actions

Community groups working collectively on disaster preparedness often emerge organically after a hazardous event [51]. For example, the South Dunedin Community Network, formed after the 2015 floods, now facilitates community involvement in flood risk reduction and climate action [52]. Civic participation can also be agency driven - facilitated by governmental agencies, non-governmental organizations, and academic institutions, that implement an intervention within the community. For example, in Hawkes' Bay, decision makers formed a collaborative working group with local authorities and community leaders to develop policy pathways for mitigating coastal hazards [53]. In Northland, the government form priority catchment groups to promote community involvement in flood risk management [54]. Externally initiated projects often involve a facilitator who mobilizes existing community groups or forms new groups. Generally supporting agencies withdraw funding and reduce active involvement after the groups becomes operational.

Encouraging communities to undertake collective actions for DRR is challenging and often unsuccessful [55,56]. Agency driven initiatives take hierarchical top-down approaches guided by pre-determined objectives established by the agency with the decision-making power residing with the agency. Such initiatives often fail to integrate the needs and priorities of community members and remain uninformed by the context, culture, practices, and norms; consequently failing to gain community interest or identify acceptable innovative solutions [57,58]. The rigidity and structure of agency-led approaches stifle emergent properties in newly formed groups. Community led initiatives, on the other hand, tap into local knowledge, aspirations, and commitment, promotes ownership and increases the likelihood of positive change within the community [31]. Therefore, such approaches that emerge through the participation of diverse community stakeholders are preferred over agency-led approaches [31,59]. Community led approaches however face challenges like difficulty in gaining community interest, undue influence of powerful voices in shaping community priorities etc. and has achieved limited success in empowering communities [60–62]. As such, in some situations, a combination of agency-led and community led approaches are considered to be more suitable [63,64].

Literature, however, lacks a nuanced understanding of the factors that foster collective actions in DRR, which is essential for informing policies and programs [65]. As such the second research question is:

RQ2. How do collective actions and civic participation for reducing disaster risks emerge in the pre-disaster stage in New Zealand and what facilitates the process?

2.4. Activities and outcomes of civic participation and collective action

The outcomes of civic participation in disaster risk reduction primarily include: i) knowledge creation and awareness generation, and ii) the implementation of risk reduction measures.

Community involvement is often sought to develop knowledge products that improve understanding of hazard risks and raise awareness. For example, co-creation of hazard awareness products, involvement in data collection in citizen science initiatives, community engaged monitoring and warning systems etc. [66–70]. While community involvement in such task-oriented actions are often for a limited duration, these actions catalyse stronger connections and relations among stakeholders and serve as "ongoing conversation prompts" ([71], p. 3).

Civic participation is also observed in implementing risk reduction actions which can be response focused and/or prevention focused [72]. Response-focused activities aim to ensure residents are self-reliant and can assist each other effectively during emergencies, enhancing their ability to cope if the community gets isolated and minimizes the strain on external resources during significant

emergencies [2]. Such actions include preparedness activities such as collaboratively developing community response plans,[1] organizing evacuation drills, first-aid skills training and maintaining dedicated facility stocked with supplies (like food, equipment, blankets etc.) that can serve as emergency response hubs in case of emergency etc. [2,48,73].

Prevention-focused activities aim to tackle the underlying causes of disaster risk creation by mitigating hazards and addressing environmental stressors. These activities include the collaborative implementation of protective measures such as conducting prescribed burns in wildfire-prone areas, maintaining health of river catchments etc. [17,74–77]. Such activities also extend beyond the immediate causes of disasters, examining the complex socio-economic, structural, and environmental factors causing vulnerabilities and aiming to address them through community-wide capacity building and empowerment [31]. For example, the 'purok' approach in the Philippines blends traditional community organization with DRR strategies, empowering citizens to control their budget, make decisions, address developmental concern, reduce vulnerability and exposure and create tailored disaster preparedness plans [36].

Academic focus in New Zealand, however, has been on people's involvement in knowledge creation and awareness generation and individual preparedness activities [4]. Research on community involvement in implementation of risk reduction activities, through collective actions is limited, and "little is known about their impact on community resilience goals" ([78], p. 2). Thus, the third research question is:

RQ3. What activities for reducing disaster risks are implemented through collective actions at the community level in the pre-disaster stage and what are their outcomes?

3. Methods

A multi case study design was adopted for this research [79] as it is useful to gain an in-depth understanding of a phenomenon in their real-world context [80,81].

Groups engaging with emergency management agencies were chosen as the study cases [82]. The boundary conditions were defined as: i) community-based groups working on DRR; ii) operating at the community, town, or district level, not regional or larger; and iii) presently active in identified locations. The research aimed to study maximum variation cases[2] and identify commonalities across the cases [79]. A two-step process was followed to identify the study groups. First, based on historical disaster data on EM-DAT[3] and Insurance Council of New Zealand and hazard profiles of each region, eight regions, four in North Island (Hawke's Bay, Bay of Plenty, Wellington, Auckland), and four in South Island (Canterbury, Southland, Otago, West Coast) were identified as regions of interest. Then, officials from CDEM groups, academics, and community leaders were contacted for insights on community participation and collective initiatives in these regions. Eventually, four community groups were selected: 1. A residents' group in Mt. Cook in the Wellington region; 2. A church-based Community Response Group, Gore, Southland; 3. Edgecumbe Community Emergency and Response Team in the Bay of Plenty; and 4. Arthur's Pass Community Response Team in Canterbury. These groups work on different hazards (like earthquake, tsunami, flood, landslides, and storms), differ in terms of hazard experiences, operate in diverse geographical and social settings (e.g. rural and urban, stable population vs moving population), and represent different organizational forms (with respect to formation, and degree of formalization) making them ideal for cross case analysis (Fig. 1).

Criterion sampling was used to recruit interview participants [83]. Emergency management officials, representatives of non-governmental agencies, leaders, volunteers and members of the community groups, who were i) working with communities, and ii) engaged in DRR and preparedness actions in the case study regions/locations were recruited. The participant profiles are presented below (Table 3.1). Between February 2022 and September 2023, thirty-five interviews were conducted using an interview guide featuring open-ended questions. Additionally, three follow-up interviews were carried out to address any ambiguities identified during preliminary data analysis. The interview questions aimed to gain insights into how the groups were established, understand their form, and structure, and identify the factors that facilitated or hindered their development, as well as the outcomes they achieved. The first author also attended six meetings of the study groups as a non-participant observer, collected documents like newsletters and reports, and maintained field notes [84].

Interviews were transcribed in Microsoft word and loaded in NVivo for thematic analysis (Braun and Clarke, 2013). The transcripts were read multiple times to become familiar with the data. Structural coding was done where codes were manually assigned to a set of sentences that contained data related to the topics of inquiry. Then concept coding and in vivo coding was done [85]. The codes were then condensed to identify the candidate themes. An iterative process followed where the coded data and the candidate themes were reviewed and revised to make sure the final set of themes captured the meaning of the data, were coherent and answered the research questions [86]. The themes were also reviewed against fieldnotes and documents for data triangulation [79]. Member checks with the participants were done to make sure the themes were credible and relevant [79].

Prior to the interviews, participants were provided with an explanation of the study's purpose and expected outcomes, and consent

[1] Community response plans identify hazards facing the community and develop standard operating procedures for response to and recovery from the hazards. It considers a range of potential risks, such as storms, floods, landslides, accidents, and earthquakes and identifies how the community can prepare using local resources and entities like doctors, ham radio operators, pharmacies, community centres etc.

[2] Aims to select cases that represent a wide range of variation across certain key characteristics. By deliberately selecting cases that exhibit maximum variation in characteristics, researchers seek to gain a holistic nuanced view of the phenomenon under investigation and explore how different factors may influence the phenomenon being studied.

[3] EM-DAT, Emergency Events Database, is a global database managed by the Centre for Research on the Epidemiology of Disasters (CRED) that tracks disasters.

Fig. 1. Map of four study sites with demographic and hazard profile. In Edgecumbe (1), Arthur's Pass Village (3), and Gore (4) the study groups are local community response teams. In Mt. Cook the group is a residents' association (Map created using SnazzyMaps - https://snazzymaps.com/).

was obtained in an online form. Identifying information were removed during the transcription of the interviews and data was stored in a password protected folder. Ethical approval for the research was obtained from Massey University and due process was followed to maintain ethical standards prescribed by the university.

4. Study groups

4.1. Edgecumbe Community Emergency and Response Team

On April 6th, 2017, the stop bank on the Rangitaiki River broke flooding Edgecumbe township [87]. During the response and recovery phase, the Edgecumbe Collective was formed, comprising community groups and service providers[4] to guide the community's transition from recovery to long-term development. Improving community preparedness was identified as a key priority. In

[4] Such as Whakatane Neighbourhood Support, Blue Light (youth organization), Fire Brigade etc.

Table 3.1
Participant profile.

Interviews participants			
Area	*Profile*	*No. of participants*	*Code*
Bay of Plenty	Volunteer in community emergency response team	4	BoP_V1 to BoP_V4
	Emergency management (CDEM) official	1	BoP_EM1
	Official from district council	2	BoP_EM2 & BoP_EM3
	NGO personnel assisting in emergency management	2	BoP_N1 & BoP_N2
Wellington	Volunteer in community group working on emergency management	5	W_V1 to W_V5
	Emergency management (CDEM) official	4	W_EM1 to W_EM4
Canterbury	Volunteer in community emergency response team	8	C_V1 to C_V8
	Emergency management (CDEM) official	1	C_EM1
	Official from district council	1	C_EM2
Southland	Volunteer in community emergency response team	6	S_V1 to S_V6
	Emergency management (CDEM) official	1	S_EM1
	Total	35	

mid-2021 a community *hui* (meeting) was organized inviting community members and different agencies, including schools, fire brigade, neighbourhood support, prominent businesses etc. to discuss possible next steps to improve community preparedness. This led to the formation of a group focused on addressing community preparedness in the town, which eventually consolidated into the current Edgecumbe Community Emergency and Response Team (Fig. 2).

4.2. Residents' group in Mount Cook, Wellington

The Mt. Cook group formed in 2007 as a residents' group for Mt. Cook neighbourhood in Wellington (Fig. 3) in response to urban development concerns. The group organizes various community activities and meets regularly to discuss local needs and concerns. During these meetings, members observed that topics related to emergency preparedness and community resilience became common themes, sparking their interest in disaster preparedness. In 2012, the community group organized an emergency expo, which served as an early contact with emergency management authorities. Over time, the group's involvement in emergency preparedness and collaboration with these authorities increased, ultimately positioning them as a key stakeholder in promoting preparedness within the Mt. Cook neighbourhood.

4.3. Arthur's Pass Community Response Team

Early civil defence efforts in Arthur's Pass village (Fig. 4) were led and resourced by the Department of Conservation (DOC). However, around 2006, DOC's involvement reduced, and the locals took over civil defence role with some support from the district council. Local involvement diminished in the following years but began to increase again in 2012 when district council officials engaged with the existing preparedness group. They assisted the group in reorganizing and provided essential information and training. By 2014, a Community Response Team (CRT) was established, consisting of interested and trained community members.

4.4. Gore Community Response Group

The church group in Gore is an existing community group and an important stakeholder in the neighbourhood. In2018,[5] Emergency Management Southland approached the group to explore their interest in becoming the designated community group for Gore to lead emergency management activities in the area. After initial meetings, the church group was officially recognized as the Community Response Group (CRG) for Gore (Fig. 5). The church premises also serves as the Gore community emergency hub.[6] Notably, during the 2020 state of emergency in Southland, the response group opened and operated the Gore hub to support initial response efforts and provide shelter for evacuees (Table 4.1).

[5] From 2018, Emergency Management Southland, adopted a systematic approach to form community response groups with their own community response plans. This approach was likely an outcome of the goals laid out in the Southland civil defence emergency management group plan, 2017–2022 (2017-southland-group-plan-update-2019-1.pdf (cdsouthland.nz)) that focuses on increasing community engagement and empowering communities to respond to emergencies. The rural nature of Southland, isolated communities and communication challenges, necessitated this focus self-sufficiency and the need to develop a grassroots network of response groups. Community-wide engagement programmes were organized with local groups and stakeholders to identify interested groups. One of the twenty-six groups formed out of this process is the Gore Community Response Group.

[6] Gathering place for the community in an emergency - that members can evacuate to, access welfare support from, and use as a meeting point to decide on actions to ensure the safety and well-being of the community.

Fig. 2. Snapshots from Edgecumbe. College road (left), floodwall reconstruction site (right).

Fig. 3. Snapshots from Mt. Cook neighbourhood, Wellington. Tasman Street (left) and board displaying community emergency response practice location (right).

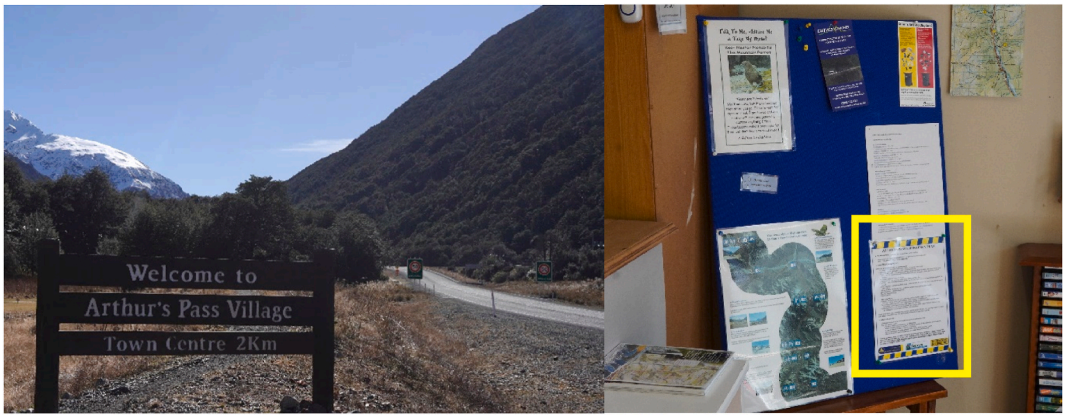

Fig. 4. Snapshots from Arthur's Pass Village. Road leading to Arthur's Pass village (left) and Information board at a motel displaying emergency preparedness information and guidelines to follow in case of emergency (bottom right).

5. Findings

The findings are organized in three sections: 1) nature and form of civic participation in DRR at the community level; 2) emergence of the community groups, facilitators and barriers; and 3) the activities and outcomes.

Fig. 5. Snapshots from Gore. Gore city centre (left) and Matura riverbank (right).

Table 4.1
Summary of the study groups.

Key information	Edgecumbe group	Mount Cook group	Arthur's Pass group	Gore group
Year of formation (approx.)	2021	2007	2014	2018
Type of group	Community response team.	Residents' group	Community response team, some members part of NZ-RT	Church based group, recognized as the community response group
Reason behind group formation	Floods affecting the area	Urban development concerns	Presence of multiple hazards; remote community that tends to get isolated during extreme events	Religious community group
How the group became interested in emergency management?	Community preparedness identified as priority during recovery	Community interest in preparedness identified during regular meetings	Community interest due to remote and hazard prone location	Council initiative for community engagement
How engagement with emergency management agencies began?	Post flood community engagement for response and recovery	Group reached out to agencies after identifying community preparedness as an interest	Council initiative to establish response groups leading to engagement with pre-existing community response groups	Regional council initiative to form response groups, leading to engagement with local stakeholders
Recognized by emergency management agencies	Yes	Yes	Yes	Yes

5.1. Nature and form of civic participation and collective action in DRR

Fig. 6 below shows four avenues through which community members participate in emergency management activities. At the lowest scale, individuals and families engage in DRR by adopting individual actions like identifying an evacuation route, keeping a grab bag ready etc.

Collective action by communities, in the most informal form, sits with key community stakeholders, like community groups, associations and organizations, community leaders and influencers. In emergencies, communities often self-organize, mobilize resources based on emergent needs, and try to restore the well-being of their communities by tapping into the existing social networks [42,88]. Key community stakeholders like local groups, and leaders play an integral role in this process. Due to their extensive local knowledge, community connections, and trust within communities, they can quickly tap into their existing social networks, gain information on community needs, connect affected people with support providers, lead spontaneous volunteers and guide initial response [42]. Recognizing this, emergency management agencies are increasingly engaging with these stakeholders in the pre-disaster stage to form working relationships. Capacity building activities are organized for the stakeholders, in the form of trainings, workshops, scenario-based exercises etc. to discuss various response scenarios and how these groups might work with emergency management agencies to deliver initial support in their communities (W_EM4). The community emergency hubs approach adopted in Wellington provides a formal model to integrate this form of community participation in emergency management process [89]. The groups, however, are not focused solely on emergency management and largely function as interest groups (W_V2). The Mt. Cook group is an

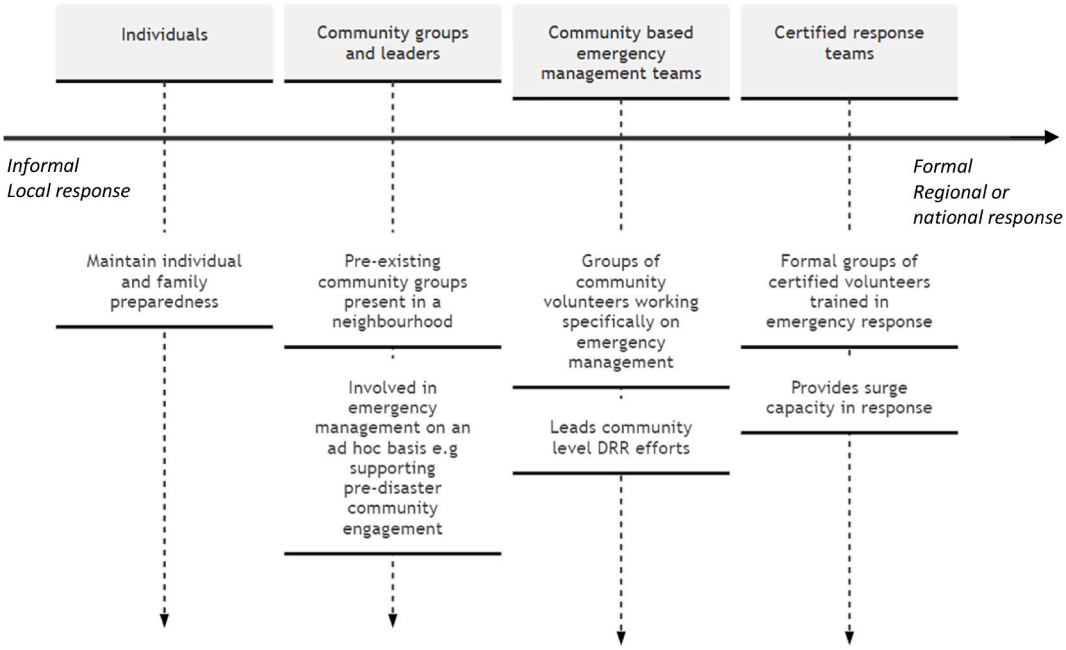

Fig. 6. Forms of civic participation in DRR actions at the community level in New Zealand.

example of this form.

Community emergency response teams[7] are community-based volunteer groups that form specifically for emergency management purposes [49]. These groups engage in improving the preparedness in their areas by assessing local needs and self-assigning tasks as per their capabilities. They work closely with emergency management agencies and actively collaborate with different stakeholders, organize community level awareness programmes and events, maintain community level response resources, and undertake capacity building activities to improve their response capacity. Such groups generally comprise of volunteers representing diverse stakeholder groups, like school board members, FENZ[8] and St. Johns[9] volunteers, representatives from NGOs, religious organizations, and have more visible structure compared to the interest groups discussed above. However, community emergency response teams are not formalized entities. While they typically are the first responders during local emergencies, the decision to deploy and undertake response activities rests with the group. The Edgecumbe, Arthur's Pass and the Gore groups represent this category.

NZ-RTs, or New Zealand Response Teams, are nationally accredited volunteer units capable of undertaking specialized response activities, like light rescue, hazard specific response, cordon and traffic management, welfare functions etc. [90] These teams comprise of trained volunteers, are formally recognized entities and are owned by councils or non-governmental agencies. They are deployed by lead agencies during emergencies, including to other areas in the country to provide surge support in large-scale emergencies. They are governed by the Health and Safety at Work Act, 2015. The CDEM Act of 2002, however, does not explicitly outline the duties and obligations of local authorities towards volunteers, it only includes provisions that allow CDEM groups to recruit, train, and support volunteers [91]. Some members of the Arthur's Pass group are part of the Selwyn NZ-RT (NZRT-21).

In addition to these groups, specialized volunteer response teams of Red Cross, Search and Rescue agencies (like LandSAR), FENZ and others also exist. However, we were unable to find other forms of collective actions, like community groups working with emergency management agencies to mitigate local hazards, address environmental stressors that create risks, or conflictual collective action in the form of rallies or protests.

5.2. Facilitators and barriers of civic participation and collective action in DRR

Aligning with existing literature, the findings from Edgecumbe demonstrate that communities with hazard experience are more likely to self-organize for reducing disaster risks [15,17,73]. The experience of the 2017 floods and the dissatisfaction with the official emergency response catalysed the formation of the Edgecumbe group.

> "We've well learned our lesson in a couple of really major events now that it takes time for the officials to get here … So, we know now that we have to be self-sufficient in ourselves for a number of days." – BoP_V1

[7] Also known as community response groups, emergency support volunteers.
[8] FENZ, Fire and Emergency New Zealand – firefighting and emergency service.
[9] St Johns – Ambulance service.

The participants, however, emphasized that having a leader or facilitator with strong community connections and knowledge is important, particularly in the initial stages of such initiatives.

> "You need someone or a group or agency that are well connected within a community... because of knowledge or experience, they know which connections or which pathways to go down... that is vital whether you are going to get people on board... " – BoP_EM2

Findings from Mt. Cook suggests that groups can engage in disaster preparedness even without a hazard experience. While the intense media coverage and subsequent public discourse following the Christchurch earthquake, 2011–12, likely heightened the awareness of the earthquake risks, it was the conversations among the group members that triggered the group's active involvement in DRR.

> "I think it's just one of those things we talked about. That was like 5 years into the group. So by that stage we were having a community picnic once a year, the gardening group had started... When we were talking in our meetings, we were 'so well, what else should we be doing?' And that was one of the things that came up." – W_V1

Ease of access to information, knowledge and training sustained the group's involvement. The local councillors connected the Mt. Cook group with Wellington Regional Emergency Management Office (WREMO) which was already engaging with multiple communities in the region.

> "We probably went through one of our city councillors. We're really lucky that over the years the councillors have been really good at being involved. You know, coming to our meetings and helping us with things." – W_V2

Additionally, the Mt. Cook group is part of a network of community groups in South Wellington. This network includes groups already collaborating with WREMO, like the Island Bay community group. Social learning from the neighbouring community group, especially regarding how collaboration between emergency management agencies and community groups should operate, what specific actions they can undertake, and what successful outcomes look like, inspired, and supported the group's involvement. This highlights the importance of community conversations, social learning from local associations, and supportive institutional structures in facilitating collective actions on DRR.

On the other hand, the findings from Arthur's Pass, show that possessing hazard awareness and experiences are not sufficient conditions to trigger collective actions. Arthur's Pass village is situated in the geographically remote alpine region, and experiences heavy rainfall and snowfall, occasionally being cut off from nearby cities. There is a culture of self-reliance and an awareness of the need to be self-sufficient for extended periods of isolation. However, even with an existing preparedness group, the proactive involvement of the council was required to support and lead the group.

> "We would probably be one of the few towns before that actually had a civil defence structure ….but there was probably a bit of a downtime after 2006 after DOC left … there wasn't much happening … from 2014, I think, there were a series of managers who sort of really kicked things into gear for the council…we received a lot more assistance … that's kind of also pushed us" – C_V1

It is important to understand why some groups struggle to sustain and how the agencies can facilitate the renewal of the groups. Firstly, unlike developmental and environmental concerns, reducing disaster risks are not a priority for many. Additionally, a lack of clarity persists on how disaster risks can be reduced collectively, what actions can be adopted, and the skills and time commitment required in it. In such situations, agency-led initiation of conversations and support to groups holds value,

> "Without casting sort of any judgment, I think that's just the pros and cons of different processes.. in a way that model is not as fitting to all members of the community but somewhere that it makes it really accessible to some … You know the consistency in process and the clarity on a very, very clear structure does enable some parts of the community all the time to be quite clear on how to engage with it." – C_EM1

Secondly, bureaucracy and conflicting priorities of different governmental agencies often places roadblocks in civic participation and collective action. For example, a community member from a flood prone area noted that remedial works like clearing river flood ways could not be undertaken as they conflict with environmental conservation regulations protecting natural habitat of an endangered fish species. In such cases, it becomes imperative for government agencies to intervene and establish frameworks for collaborative decision-making and action that ensures a balance is maintained between environmental conservation and meeting community needs. Without such measures, grassroots efforts on preparedness will yield little impact, leading to frustration and waning community participation. One participant voices that "in each community there will be a small group (willing to engage in community work). when it (community work) falls on the shoulder of a few, the few needs to be supported" (C_V8).

Thirdly, while communities should be empowered to take care of themselves, that should not imply a transfer of responsibility. Organic, and emergent community driven initiatives require support from emergency management agencies for technical knowledge transfer, skill development and provision of resources. This requires equal partnership, in the absence of which community driven initiatives crumble. Citing the example of a community group that could not sustain, a participant notes that

> "(Emergency management agencies think) what you needed really was some drivers some leaders within the communities, and then the agencies wouldn't be required to do the work … they could just motivate community representatives to do it for them … I think that's where it broke down and that it was kind of not a shared responsibility, but rather a transfer of responsibility …

> in this very successful case, the woman (who was leading the community group) moved on to other areas and as I understand, it (the group) hasn't been operating to my knowledge … often the leaders of our community are … busiest and juggling all sorts of different responsibilities. So, my feeling is it's not realistic to transfer that model and consider that communities need to look after themselves and it's not an agency responsibility, it must be done in partnership." - W_V3

To facilitate the formation and sustenance of community groups in situations where forming new groups is difficult or existing ones are disintegrating, firstly, it is essential provide clear and honest communication on why civic participation is necessary and how that benefits communities to secure community buy-in. One participant notes that, "You've got to keep your why in front of you …. (it's) going to take time and … resources and you have to actually put why we exist here, as a group, collectively, and volunteers" (BoP_EM2). In Arthur's Pass, officials highlighted the need for the groups to ensure immediate information was available post emergencies:

> "When we (civil defence team) think about the response, how did things go and what can we do to be better off next time.. what they recognised was in this major event (we) had no simple way to find out how everyone was doing where, where should they be sending their resources … (so we) identify these are some communities we need to prioritize, and we need to reach out to them proactively." – C_EM2

Secondly, in all the study groups we found that facilitators play a crucial role. Their knowledge, facilitation skills and relationship building abilities influence the outcomes, particularly in agency-led initiatives. In Selwyn, the co-ordinator of the community response teams is also the co-ordinator for the neighbourhood support and has been working in the area for over ten years. Due to her long association with the communities, she is well connected and trusted. She also possesses rich contextual knowledge which helps in providing locally relevant information and devising solutions that are acceptable and sustainable. Participants noted that the skills brought by her team significantly improved the way things were happening.

> "The level of skill is a lot higher than it used to be…people like C_EM2 and (names another official) and the people who are there are probably much more skilled at how they organize things. So, all of a sudden, this whole network of CRT's all over the district has really taken off … I personally find a lot of it comes down to the skill of the people doing it…I mean you see difference … I guess if she wasn't any good at that we probably wouldn't" - C_V3

Thirdly, ensuring that agency-driven programmes are flexible to support local initiatives and emergent solutions is essential to foster mutual respect, goodwill, and trust. Describing their approach to supporting local initiatives, an official mentions,

> "We work with them … by providing, some of the resources … But they also use their own initiatives. One of the members (of a community response team) has gone to the management there and they have agreed to sponsor the whole team with complete wet weather gear which is huge…we can't give everything always because we can't afford to but we do try to support them as much as we can, and I really love it when they use their own initiative and do something like this." – C_EM2

Such support demonstrates that the emergency managers are "approachable, very engaging and always been very positive and supportive" (C_V4), and contributes to the community intentions of working collaboratively for reducing disaster risks.

5.3. Activities and outcomes

The groups are involved in preparedness tasks like developing community emergency plans, updating the plans, identifying evacuation centres, establishing protocols for setting up community emergency hubs, preparing contact lists and repository of equipment, maintaining equipment like radio, wet weather gear etc. The groups also assume the duty of opening local emergency centres (e.g. community emergency hubs) in their areas to cater to the emerging needs till specialized services can arrive. They take a leading role in organizing and guiding spontaneous volunteers as observed in Gore. Some groups have taken up their own initiatives to secure support or resources for their communities by reaching out to private agencies, applying for council funding or through other means.

> "We identified a number of things that we felt would be most helpful in those initial first day or two…she managed to see some funding from this organization.. the funding came in and so yeah, we've gone and spent a bit of money." – BoP_V1

Some groups assume advocacy functions as well. For example, the Mt. Cook group is presently engaging with a housing development agency to ascertain the arrangements for emergency drinking water. The housing agency is constructing affordable multi-level flats. Owing to the small size of the dwellings, the houses have limited space to store the prescribed amount of drinking water for emergencies. The community is advocating on behalf of the residents to ensure that alternative water provisions are considered, or mechanisms are established to address this issue effectively.

> "I think water is going to be the big issue... not everyone can store water … the people living in the small apartments have got lots of things going on in their lives.. and then pushing them to do these things (storing drinking water) … they don't have the space … (Organization name) is doing these massive housing projects without any thought about emergency water provisions in those houses. That's something we keep lobbying for, to think about supply of water to their tenants in the case of an emergency …. so yeah, when we have an issue we'll work on that issue to right things up, getting the message out about" – W_V1

The groups also play a crucial role in fostering connections and communication among emergency management agencies and

communities. In the pre-disaster stage, the groups act as liaison between emergency management agencies and communities. As the groups are well connected within their communities, their association with emergency management agencies increases the visibility and reach of the agencies and provides them access to a wider network for promoting preparedness, raising awareness of hazards, and sharing hazard warnings and information on recommended action. The group members also connect officials with resourceful people and representatives of vulnerable groups, help in gaining interest of diverse stakeholders and recruit participants willing to volunteer in preparedness activities.

During an emergency, they provide up to date information about the ground conditions to emergency management agencies thus providing them situational awareness. They also communicate official information within their communities. As the volunteers come from within the community, are familiar to community members, and often police vetted, they are trusted. Thus, they serve as the trusted connection between the emergency management agencies and the affected communities.

> "We can be here at the district EOC and very quickly and easily find out what is happening throughout the whole district by speaking to the volunteers ….they are our eyes and ears at the street level…our direct link in the communities …" – C_V2

Disasters often generate strong shared intention of strengthening disaster resilience and prompt collective actions. However, as disaster memories fade, the strong sense of solidarity and urge to reduce disaster risks that emerge in the aftermath of an event diminishes, potentially becoming a lost opportunity. The findings from Edgecumbe demonstrate the role community groups play in preserving hazard memory and ensuring the collective efforts triggered post disasters are sustained. The Edgecumbe group that emerged after the floods played a crucial role in maintaining a discourse on preparedness in the community and preserving the shared experiences, knowledge and networks that formed in the aftermath of the flooding. It ensured a continuity in efforts towards improving community preparedness.

The groups also contribute to the social capital[10] of the communities. By holding regular meetings (*huis*) between community representatives, service providers and the broader community at a physical gathering place, the groups create spaces for community members to connect, share, and engage in discussions, develop a sense of familiarity, trust and belonging and establish relationships. The regular meetings amongst the team members, interactions with external stakeholders, engagement with broader community, achievement of small successes like establishing the evacuation centres by working collaboratively, etc., creates an environment where people feel connected, supported, "and part of something larger than themselves". One participant from Edgecumbe comments,

> "We did events to bring community back … We did drop-in centres, talks.. making sure we're all linking with each other … It was really a reconnection of communities." – BoP_EM2

This contributes to the social fabric of the township, particularly building social capital which is considered as an important element in community resilience [38,92]. However, it is noteworthy that, despite having a strong community presence, most groups find it challenging to connect with every segment of the community. For example, the Mt. Cook group possesses a strong network within the residents and also with the councillors, civil defence authorities and other government agencies, however, it struggles to establish connections with certain groups.

> "Residents groups like this will generally attract the longer term residents of the suburb who generally happen to be old like me, and who own their own house like me, so there are two other types of residents in Mount Cook who we struggle to represent, one is the students who might flat in the place for two or three years … and the other is social housing residents." – W_V2

The outcomes of pre-disaster civic participation and collective action in contributing to disaster resilience can be visualized in the form of an iceberg (Fig. 7). On the surface, the visible, tangible, and measurable activities and outcomes can be observed. These include creating response plans, contact list, maintaining equipment etc. However, multiple intangible impacts are also achieved in the process. For example, working together helps in building a sense of community, connections, sense of solidarity, and social capital. These are not distinctly observable and measurable, but extremely important for improving the resilience of a community.

6. Discussion

Two main factors prompt civic participation in DRR – i) heightened hazard awareness either through hazard experience (Edgecumbe and Arthur's Pass) or because of public discourse on hazards (Mt. Cook) and ii) facilitation by emergency management agencies (Gore and Arthur's Pass). Having trusted community coordinators with extensive local knowledge was recognized as a crucial facilitating factor for all four groups. The barriers in fostering and sustaining civic participation include a lack of community interest in DRR, bureaucracy, and poor institutional support. The findings show that while hazard awareness is an important factor [15,17,73], it does not necessarily trigger community initiated collective action (Gore) or sustain it (Arthur's Pass). The findings also indicate that with an enabling environment community actions can be triggered by external agencies as well (Gore) [93].

Collective action through civic participation is observed in three forms in the pre-disaster stage – through existing community groups, community emergency response teams, and certified response volunteer groups. This approach integrates community emergency management groups as well as broader community groups working on developmental issues (like urban development concerns, community health, etc.) in emergency management adopting a broader perspective towards building resilience. The groups

[10] Social capital is the shared resource within a group comprising of sets of relationships, networks, interpersonal connections, common norms, values, beliefs, trust, and structures that enable collaboration and joint efforts for the mutual advantage of individuals involved.

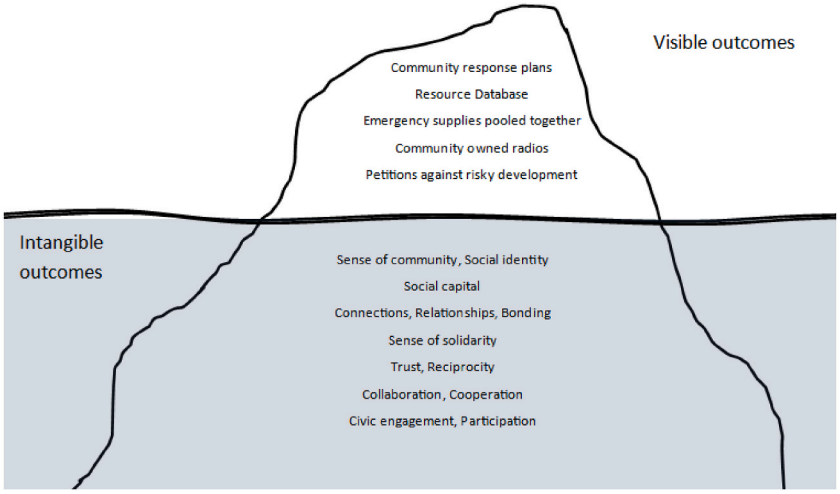

Fig. 7. Visualizing the outcomes of collective action in preparedness as an iceberg.

engage in preparedness activities, capacity building, advocacy, promote connections and communication, enhance situational awareness, and contribute to strengthening intangible assets such as a sense of community and social capital. By working collaboratively, community groups and emergency management agencies establish clear mechanisms for the groups to support emergent needs post disasters. The findings from Gore highlight the importance of such groups during response and recovery aligning with previous research [40,94].

However, there is limited focus on prevention and building long term resilience. We were unable to find groups engaging in emergency management and non-structural mitigation through natural resource management. On the contrary one of our findings highlights conflict between emergency management and environmental priorities. While community groups for maintaining health of rivers, like catchment groups, exist, and are involved in consulting, planning, advocacy, wetland restoration, soil conservation etc. [54,95,96], their role in non-structural mitigation and hazard protection actions for risk reduction remains under recognized, unlike in countries like UK where they are key stakeholders in flood risk management and response [8]. Similarly, we were unable to find landowner or forest user groups in New Zealand involved in wildfire mitigation which is observed in many countries [17,74,77]. It is noteworthy that many people who volunteer in emergency management are also volunteers in Fire and Emergency New Zealand and in natural resource management activities, through DOC, Landcare, and Coastcare. Emergency management and natural resource management are also generally under council responsibility. These factors may help in bringing synergy to the activities happening at the community level in emergency management and natural resource management through informal interactions. However, there is a need to formally recognize the dependencies, integrate related activities, and adopt a holistic perspective on DRR involving both preparedness and mitigation.

There is also a lack of clarity on how existing institutions of the indigenous Māori people are considered within the current approaches of promoting pre-disaster collective actions. During the interviews we found that separate workstreams exist for engaging different groups, including the Māori people, which is valuable. However, it remains unclear how these workstreams operate in synergy with the programmes designed for the mainstream groups and how they enable effective collaboration among different community groups, both before and after an emergency. While informal connections exist in some areas, there is a pressing need for clearer and more formal mechanisms to ensure coordinated and effective risk reduction efforts. Additionally, it is equally important to consider other underrepresented groups and demographics, such as culturally and linguistically diverse communities, socio-economically disadvantaged groups, gender minorities and identify pathways to integrate and collaborate with these groups in DRR processes and decision-making.

Also, it is noteworthy that although, the groups contribute to social capital, even well-connected groups, like the Mt. Cook group, struggle to connect with and represent every segment within a neighbourhood. Our findings align with other studies in New Zealand that highlight strong bonding capital does not naturally progress into linking and bridging capital[11] [97–99]. This underscores that government agencies still need to actively work with a variety of partners even in the same suburb to cater to different groups, perspectives, and needs, particularly to reach marginalized groups, as such groups continue to remain under-represented in participatory processes [44,100–102].

To address these gaps, emergency management agencies need to adopt a holistic lens moving away from the narrow response centric focus. It is essential to recognize the linkages of emergency management with other sectors and make institutional provisions

[11] Bonding capital - Connections between groups similar in their composition, values etc.; Bridging capital - Connections between groups dissimilar in their composition, values etc.; and Linking capital - Connections across power structures. Kyne, D., & Aldrich, D. P [92]. Capturing bonding, bridging, and linking social capital through publicly available data. Risk, Hazards & Crisis in Public Policy, 11(1), 61–86.

that enable integrated, cross-organizational collaboration. It is also important to include broader functions within the role definition of local emergency management groups, provide adequate staff and conduct capacity building activities as well as ensure community groups are supported to engage in addressing problems that concern them, including contentious developmental issues and adopt corrective actions at both policy level and implementation level [88].

A broader concern lies in the fact that community participation, collective action and the concept of resilience could be exploited to transfer responsibility to communities with the "desire to cut costs and 'pass the buck' onto citizens" ([46], p. 67), instead of true partnership. Though the community might be involved in meetings, advisory committees or consultation groups through seemingly community engaged participatory processes, they would possess no real power to influence the decisions. Such participation is depoliticized lacking power to address structural problems [53,100,103], "exemplify, at best, passive collaboration, at worst, manipulative consultation done only to help advance a predetermined objective" ([104], p. 187) and reinforces settler-colonial dynamics by favouring institutions, ideas and narratives of those in power [53,60]. This calls for a nuanced understanding of civic participation from the lens of decision-making power reflecting on who is actually making the decisions by critically examining factors like locus of power, control over decision making processes, mode of intervention, flow of communication etc. [105–109].

Additionally, the findings from Arthur's Pass highlight that a re-consideration of our understanding of community led and agency driven approach is needed, to identify how these approaches should be adopted in practice, in different contexts with varying socio-economic, cultural, and political dynamics [110]. There is a need for abandoning the coarse agency led - community led binary and examining the different modalities of decision-making in participatory processes – on what decisions community input is sought, in what ways the inputs are sought, do people need to go through bureaucratic processes to provide inputs, is community input only a consideration or a deciding factor in the decision-making process?

The idea of communities also need to evolve beyond the simplistic understanding of communities as stable cohesive units connected by collaborative networks ready to work together. Rather, it should consider communities as spaces of contestation as well where competing demands, conflicts of interest, and negotiation among different groups of people are common [36,111]. It is this dynamic of collaboration and contestations that determines how social capital evolves in the community and whether the community can self-organize (or can be organized) to act collectively. It is also crucial to recognize that all collective actions for DRR are not equal - some benefit the entire community, while others favour only a few - leading to varying levels of interest, support, and participation. Collective action literature acknowledges this difference and distinguishes between collective action as conversionary (e.g. in environmental action where the focus is not to elevate the status of the in-group members, but rather to convince out-group members to subscribe to the in-group's worldview and transforming the out-group into the in-group [14]) or competitive/conflictual (e.g. in social protests and movements where the in-group members[12] are trying to elevate their status as compared to the out-group members [112]). Adopting a similar lens in DRR, distinguishing the types of action, rather than assuming all collective actions are universally supported, can help develop more effective policies and practices.

This paper explores the concept of civic participation and collective action in DRR. Currently, the term refers to a wide array of concepts which causes ambiguity - to the extent that the concept loses relevance. To address this issue, we organize the forms of participation by examining the degree of formalization and organization. We hope that this will help in avoiding ambiguities and help in identifying appropriate policy and programmes to promote civic participation in DRR. Future research can explore each of these forms in details, examining which forms are suitable in which context. Our study only includes four groups, identified through consultations with academics, community leaders, and emergency management organizations. The study would have benefitted from a wider range and number of groups to further refine and improve the insights. Additionally, businesses, critical infrastructure agencies, and other entities are also an integral part of community and future research could explore how these entities contribute to collective emergency preparedness. The paper also identifies some of the factors supporting civic participation and collective action. However, an in-depth study exploring the factors is necessary. Additionally, multiple studies highlight the central role of communication in encouraging civic participation [113,114]. Future research should explore how communication can be leveraged to facilitate these efforts.

7. Conclusion

One of the priorities outlined in New Zealand's 2019 National Resilience Strategy is to empower communities to enhance their resilience by promoting collective actions across all sectors of society. In this context, we aimed to understand what collective action means, how it is currently manifesting in New Zealand, what factors influence it, what activities and outcomes are achieved through it, and how it can be improved.

The findings indicate that collective action in DRR in the country primarily occurs through three avenues: through diverse community groups engaged in various community activities, through informal community emergency response teams focused on emergency management, and through specialized and formalized response teams of community volunteers. These groups undertake prescriptive tasks (like building community response plans, maintaining community resources), improve communication across different stakeholders and contribute to intangible community resources like community connections and social capital. and communication among different stakeholders, and the community. Factors that support the emergence and sustenance of collective action in DRR include hazard experiences and awareness, community conversations, supportive institutional structures that provide

[12] In-group – The group with which an individual identifies and feels a sense of belonging or solidarity.

access to technological knowledge, skill development, and resources, the presence of community organizations involved in DRR activities and social learning from them, clarity on the purpose of initiatives and requirements from community members, the presence of skilled facilitators, and ensuring solutions provided by community members receive adequate support.

While the current forms of civic participation are promising, we find that the existing approaches have a narrow, response-centred framing and lack the potential to address broader developmental and environmental concerns that lead to risk creation. The findings also suggest that in certain situations, community-led approaches struggle, and in these cases, the support and leadership of official agencies are crucial to sustain the initiatives. Future research exploring in-depth the factors that influence civic participation and collective action, the role of engagement and communication in supporting such initiatives, targeted studies of different community groups and the facilitators and barriers to their participation in collective initiatives, and the evaluation of different approaches and their contributions to reducing disaster risks at the community level would be beneficial.

CRediT authorship contribution statement

Manomita Das: Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Julia Becker:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization. **Emma E H Doyle:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Manomita Das reports financial support was provided by Resilience to Nature's Challenges. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijdrr.2024.104954.

Data availability

The data that has been used is confidential.

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