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Dear *UCL Open: Environment* Editorial Team

Submission of a research article 'Widening participation in community-based disaster risk reduction and climate change adaptation in Japan'

We wish to submit a manuscript entitled **'Widening participation in community-based disaster risk reduction and climate change adaptation in Japan'** for consideration for the special series focusing on community responses to climate change of *UCL Open: Environment*. We confirm that this work is original and has not been published elsewhere nor is it currently under consideration for publication elsewhere.

This **research article** is an innovative attempt to examine community participation in disaster risk reduction (DRR) applying the notion of 'widening participation', which was originally a higher education policy in the UK. By 'DRR', the paper supports the perspective of 'DRR including and climate change adaptation'. The existing participation literature addresses either the types of participation or 'success' factors for participation. The paper proposes there is also a challenge of widening participation, particularly in the initiatives recognised as 'good practices'. Drawing on the four community-based DRR projects empirically studied, the paper identifies how they encourage non-participants to get involved in their activities. The paper also discusses *machizukuri* [community development], which has increasingly become an overarching social policy integrating health, welfare, education and DRR/CCA. Participation is emphasised as a requisite of *machizukuri* in developing a resilient and sustainable community and ultimately, a democratic society.

Please address all correspondence concerning this manuscript to k.kitagawa@ucl.ac.uk. We look forward to hearing from you.

Thank you for your consideration of this manuscript.

Sincerely yours

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Widening participation in community-based disaster risk reduction and climate change adaptation in Japan

Abstract: This paper discusses community participation drawing on ongoing disaster risk reduction and climate change adaptation projects in the communities affected by the Heavy Rain Event of 2018 in western Japan. By 'DRR', the paper supports the perspective of 'DRR including CCA'. 'Participatory' approaches have become a mainstream methodology for community-based DRR as advocated in the Sendai Framework for Disaster Risk Reduction. The existing participation literature addresses either the types of participation or 'success' factors for participation. The paper proposes there is also a challenge of 'widening participation', particularly in the initiatives that are already recognised as 'good practices'. Originally widening participation was a higher education policy in the UK aiming to broaden the demographic composition of the student base. Borrowing this notion, the paper identifies how each project encourages non-participants to get involved in the project activities. The paper also draws on *machizukuri* [community development], which has increasingly become an overarching social policy integrating health, welfare, education and DRR. Participation is emphasised as a requisite of *machizukuri* in developing a resilient and sustainable community and ultimately, a democratic society.

1. Introduction

This paper discusses community participation drawing on ongoing disaster risk reduction (DRR) and climate change adaptation (CCA) projects in the communities affected by the Heavy Rain Event of July 2018 Centered on West Japan. The locations of the field sites are two wards in Mabi Town in Okayama Prefecture, and Miyoshi Ward and Nomura Town in Ehime Prefecture. The existing participation literature addresses either the types of participation or 'success' factors for participation. The paper proposes 'widening participation' is another dimension in considering participation for those ongoing initiatives that are working well. Originally 'widening participation' was a higher education policy in the UK introduced in the 1990s to broaden the demographic composition of the student base (Connell-Smith and Hubble, 2021). The paper borrows the notion in identifying the projects' key strategies for widening participation. The paper also draws on *machizukuri* [community development], which has increasingly become an overarching social policy integrating health, welfare, education and DRR in Japan. Participation is emphasised as a requisite of *machizukuri* in developing a resilient and sustainable community and ultimately, a democratic society. The paper thus deals with communities' participation as social action in pursuance of a democratic society. For 'community', the paper uses it as 'a community of interest' formed in a certain geographical location by local residents.

DRR aims to prevent new and reduce 'existing disaster risk and manage residual risk, all of which contribute to strengthening economic, social, health and environmental resilience, and ultimately to the achievement of sustainable development' (UNDRR, 2020). CCA is defined as 'the process of adjustment to actual or expected climate and its effects, to moderate harm or exploit beneficial opportunities' (IPCC, 2012, p. 5). A number of authors have argued for the benefit of linking DRR and CCA in achieving sustainable development (e.g. Birkmann and von Teichman, 2010; Kelman et al., 2015; Kitagawa, 2021; Lei and Wang, 2014; Schipper and Pelling, 2006; Thomalla et al., 2006). Both DRR and CCA aim to manage and prepare for risks related to climate changes and extreme situations

via vulnerability reduction, promotion of inclusiveness and long-term disaster risk management. Separation can result in one practice in one field undermining a longer-term aim in another (Forino et al., 2019; Gaillard, 2010; Kelman et al., 2017; Schipper et al., 2016; Schipper and Pelling, 2006). In support of this position, by 'DRR', this paper refers to 'DRR including CCA'.

'Community-based DRR' has become a mainstream methodology for 'all of society engagement' in DRR as advocated in the Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2015). In 1989, Maskery argued for the significance of community engagement in disaster mitigation schemes (Maskrey, 1989). Since, many donors and researchers have developed and implemented a range of innovative participatory programmes, together with local communities, organisations and authorities (e.g. Kitagawa, 2019; McNamara and Buggy, 2017; Samaddar et al., 2019; Shaw, 2016; Van Niekerk et al., 2018). Based on the perspective that 'CBDRM [community-based disaster risk management] is a participatory process' (Van Niekerk et al., 2017, p. 7), 'participatory DRR' has often been used as a synonym for community-based DRR. The paper focuses on 'participation' but uses 'community-based DRR' in referring to the studied cases in differentiating them from top-down and authority-led projects.

Japan is one of the disaster-prone countries that has keenly promoted community-based DRR. The 2013 revised Disaster Countermeasures Basic Act introduced a new system of Community Disaster Management Plans (Cabinet Office, Government of Japan, 2021). Every community is encouraged to create a plan. Japan has a policy framework of public help [*kojo*], self-help [*jijo*] and collaborative help [*kyojo*], which emphasises the importance of the balancing of the three. Since the devastating experience of the 2011 Great East Japan Earthquake and Tsunami, policy-makers and experts have stressed the tripartite framework even more in preparing for forthcoming disasters (Kitagawa, 2016; Kitagawa et al., 2017). One of the key measures has been the system of Community Disaster Management Plans. Aiming for a collaborative model for DRR, the system enables community residents to participate in the process of developing a plan, together with the municipal government disaster management council. The government has offered subsidies and expertise to support communities in creating plans (Cabinet Office, Government of Japan, 2021).

The paper first describes the Heavy Rain Event of 2018 and its major damages in the affected areas. This is followed by an explanation of the methodology of the study. The empirical investigation was conducted in October and November 2021. The literature review focuses on the widening participation perspective in the context of Japan and the key theories of participation. The findings section describes the four projects identifying their widening participation strategies. The conclusion further considers some key characteristics of DRR in present Japan, which could be transferrable elsewhere.

2. The Heavy Rain Event of July 2018 in Western Japan and its impacts

On 5 July 2018, the rain front halted in western Japan, and the following three days, forming 15 line-shaped precipitation systems over western Japan. Coupled with Typhoon Prapiroon emerged around Okinawa Island on 2 July, the rain front brought record-breaking rains across Japan, particularly in western Japan. The total precipitation exceeded 1,800 mm from 28 June to 8 July in Shikoku Island and 1,200 mm in the Tokai region – two to four times more than the average monthly precipitation in July. The largest 24-hour, 48-hour and 72-hour precipitations in recorded history were observed in the northern Kyushu, Shikoku, Chugoku, Kinki, Tokai and Hokkaido regions (Figure 1-4) (Cabinet Office, Government of Japan, 2019, pp. 2–5). The Japan Meteorological Agency Advisory Panel

suggested the Heavy Rain Event could be linked to climate change, associated with a long-term trend of temperature increase and a similar increasing trend in the amount of water vapour in the air (Tokyo Climate Center, Japan Meteorological Agency, 2018).

Figure 1: Daily Precipitation (1-km-mesh precipitation distribution obtained by analysing data from weather radars, AMeDAS, and other rain gauge systems)
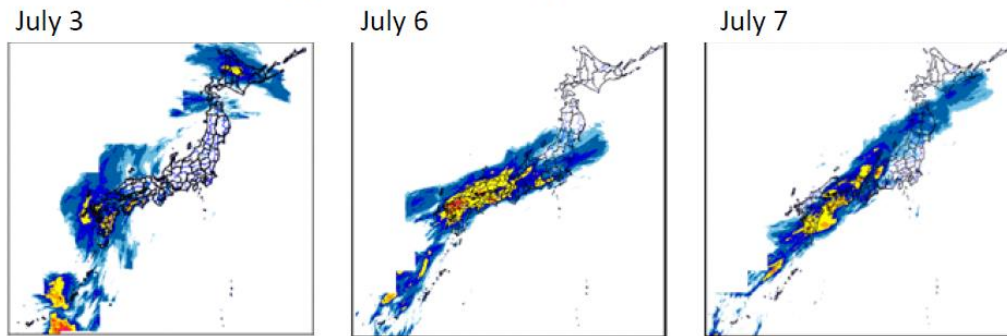

Figure 2: Precipitation distribution during the event (between 00:00 on June 28 and 24:00 on July 8)
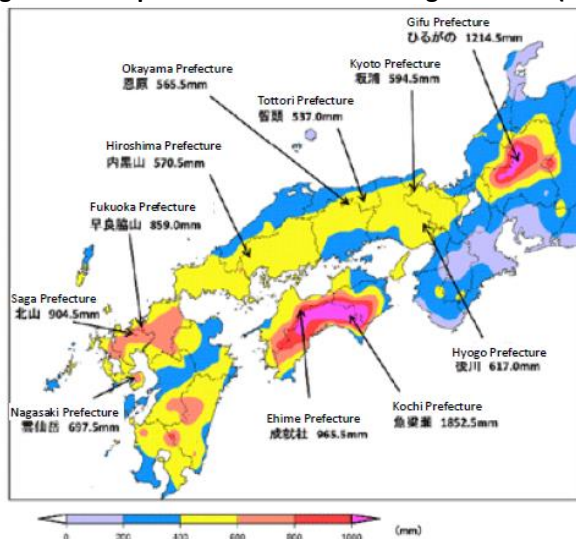

Figure 3: Distribution of the maximum 72-hour precipitation during the event
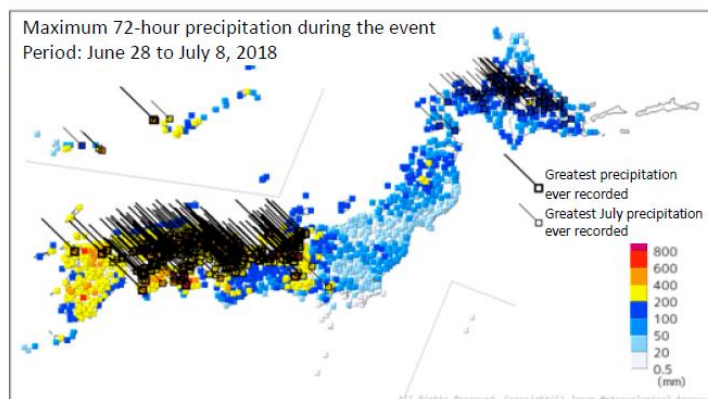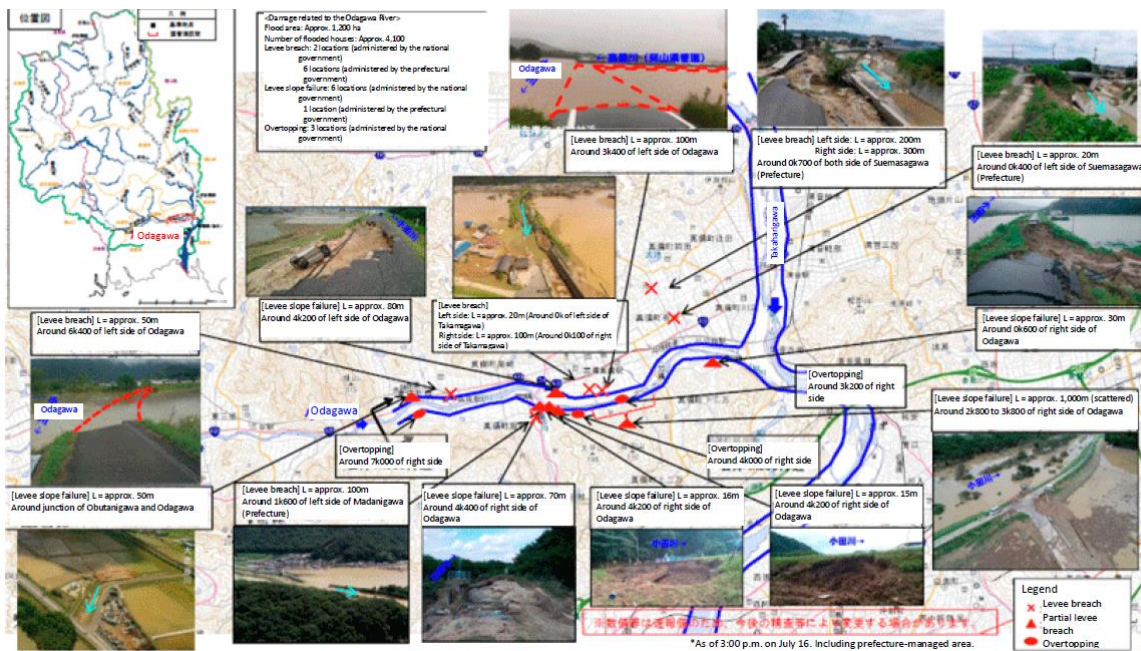

Figure 4: Levee breaches in the Takahashi River, Kurashiki City, Okayama Prefecture

Causing river flooding, inundation and sediment, the Heavy Rain Event left serious damage in these regions. 237 persons dead, 8 missing and 432 injured as shown in Table 1. 6,767 houses completely destroyed, 15,234 half or partially damaged and 28,469 inundated as indicated in Table 2 (Cabinet Office, Government of Japan, 2019, pp. 2–6).

Table 1: Human Casualties (as of 9 January, 2019)

Prefecture	Fatality	Missing Persons	Seriously Injured	Lightly Injured
Okayama	66	3	9	152
Hiroshima	115	5	61	85
Ehime	31		33	2
Others	25		20	70
Total	**237**	**8**	**123**	**309**

Table 2: Houses damaged (as of 9 January, 2019)

Prefecture	Completely destroyed	Half-destroyed	Partially damaged	Above-floor flooding	Below-floor flooding
Okayama	4,828	3,302	1,131	1,666	5,446
Hiroshima	1,150	3,602	2,119	3,158	5,799
Ehime	625	3,108	207	187	2,492
Others	164	1,231	534	2,162	7,559
Total	**6,767**	**112,433**	**3,991**	**7,173**	**21,296**

In terms of infrastructure, power outages affected approximately 80,000 households, gas disruption affected approximately 290 households and water outages occurred in 80 municipalities in 18 prefectures, affecting approximately 260,000 households. Power and gas supplies were recovered on 13 July and 8 July respectively, while water supply was not restored until August 13 (Cabinet Office, Government of Japan, 2019, p. 7).

Under these circumstances, 28,000 evacuees emerged (2,500 in Okayama Prefecture, 800 in Ehime Prefecture), most of whom stayed in shelters, of which the total number became 3,779 (436 in Okayama Prefecture, 462 in Ehime Prefecture). One month after the disaster, the evacuee number dropped to 3,500, and all shelters, except some welfare shelters, were closed in December (Cabinet Office, Government of Japan, 2019, p. 7).

The major damage in the four field sites is summarised as follows.

Table 3: Damage of the 2018 disaster in field sites

Damage	Kawabe Ward, Mabi Town, Kurashiki City, Okayama Pref	Yata Ward, Mabi Town, Kurashiki City, Okayama Pref	Miyoshi Ward, Ozu City, Ehime Pref	Nomura Town, Seiyo City, Ehime Pref
Population/ households	4,394/1,734 as of 30 June, 2018	4,951/1,970 as of 30 June, 2018	885/403 as of 30 June, 2018	3,424/8,359 2015
Completely/ partly destroyed occupied houses	4,646/846 Kurashiki City as a whole as of 5 April, 2019		1/57	117/215
Dead/injured persons	52/120 Kurashiki City as a whole as of 5 April, 2019		0/0	5/0

Source: Mabi Town (Kurashiki City, 2019); Miyoshi Ward data provided by Miyoshi Community Centre; Nomura Town (Nomura Recovery Machizukuri Design Workshop, 2020; Seiyo City, 2018)

Figure 5: Flooding situations on 7 July, 2018: top-left, Kawabe Elementary School in Kawabe Ward, Mabi Town taken by the then Headteacher Mr Takuro Honda; top-right, rescue action in Yata Ward, Mabi Town (Asahi Shimbun, 2018); bottom-left, around the community centre in Miyoshi Ward (Japanese Society for Rehabilitation of Persons with Disabilities, 2018); bottom-right, evacuation in Nomura Town (Seiyo City Disaster Countermeasure Headquarter Operation Improvement Working Group, 2019)
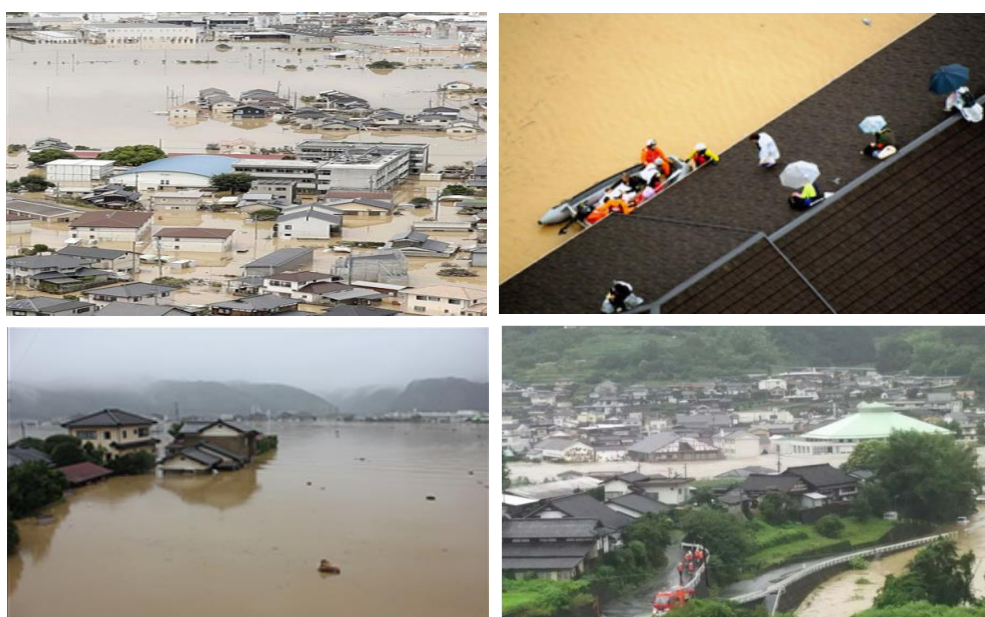
3. Methodology

This study is of an interpretivist nature and employs a case study approach investigating four community-based participatory DRR projects in the west part of Japan. Three years on since the disaster, these communities have started engaging in DRR activities moving forward from the recovery phase. Those projects comprise various DRR activities through which local residents experience participation. The study was guided by the following research question: *What strategies do communities use in widening community participation in DRR activities?*

The study set the following criteria for the selection of the case projects:
1. The project is self-managed by the community of interest, which engages in the planning, implementing and evaluating of DRR activities;
2. The project's DRR activities are participatory and collaborative;
3. The project involves collaboration with various stakeholders, such as local governments, NPO/NGO and expert academics in the field of DRR;
4. The project aims to reduce the disaster risk of torrential rain and flooding.

Four projects were identified by two means. Two projects were selected from the awardees of the Disaster Prevention and Community Building Awards (Fire and Disaster Management Agency, 2021) administered by the Japan Fire and Disaster Prevention Association, which was available in the public domain. The other two projects were introduced via our academic networks. Two researchers invited us to their fields in which they undertake recovery and community development [*machizukuri*] together with local residents.

Table 4: Details of the four case projects

Project title	Aruku project (A)	Satsuki project (B)	Evacuation card project (C)	Disaster education project (D)
Location	Kawabe Ward, Mabi Town, Kurashiki City, Okayama Prefecture	Yata Ward, Mabi Town, Kurashiki City	Miyoshi Ward, Ozu City, Ehime Prefecture	Nomura Town, Seiyo City, Ehime Prefecture
Disaster experience	Floods from rivers	Floods from rivers	Flood from inland waters, floods from rivers	Typhoon, flood from inland waters, earthquakes
Disaster cycle	Relief, recovery, preparedness	Preparedness	Preparedness	Recovery, preparedness
Interviewees	Leader (A-L)* 3 project members (A-M1, -M2, -M3) 1 researcher (AB-R) 1 NGO (AB-N) 1 local government official (AB-O)	Leader (B-L) 1 project member (B-M) 1 researcher (AB-R) 1 NGO (AB-N) 1 local government official (AB-O)	Leader (C-L) 2 project members and 2 residents (C-M1, -M2, -M3, M4) 1 local government official (C-O) (Group interview)	Leader (D-LO) 2 researchers (D-R1, -R2) 1 local government official (D-LO)

| Observations | Primary school's DRR walk in the ward | Exercise & teatime for the residents | -- | Primary school's DRR education class; high school's group discussion |

*L – leader; M – member; R – researcher; N – NGO; O – government official

The starting point of the study was these four projects were regarded as 'good practices'. Particularly the first two projects have had many media exposures (e.g. Budo no Ie, 2021a; Kawabe Recovery Project Aruku, 2020). Three have received recognitions and awards from the Japanese government and agencies. Aruku Project was awarded in 2020 the Regional Revitalization Awards organised by 46 regional newspapers and Kyodo News (Kawabe Recovery Project Aruku, 2020; Press Net Japan Co., Ltd., 2021). Satsuki Project recently received the Prime Minister's Awards for the Distinguished Persons in the Contribution to DRR (Ministry of Internal Affairs and Communications, 2021). The project was also one of the awardees of the 25th Disaster Prevention and Community Building Awards administered by the Japan Fire and Disaster Prevention Association (Fire and Disaster Management Agency, 2021). Evacuation Card Project received the same award in the previous year. The fourth project has not yet been officially recognised given it is still at an early stage as a larger scale scheme. Anecdotally, however, stakeholders including the researcher who is one of the main architects of the recovery project have confirmed its firm implementation process and the community's high level of social capital. This point is elaborated in a later section.

The main methods of data collection were semi-structured interviews and site observations. These methods allow the gathering of real-life narratives, which enabled us to grasp historical experiences and socio-cultural perceptions of the communities around disaster, community and participation. As a pilot study, the sample size was small. But it served the purpose of discussing each project's approach to promoting participation. With the interviewees' permission, the interviews were recorded and summarised. The interviewees are anonymised and quoted using the coded references indicated in Table 4.

4. Widening participation and *machizukuri*

Originally, widening participation refers to an approach which addresses 'discrepancies in the take-up of higher education opportunities between different under-represented groups of students in the UK context (Connell-Smith and Hubble, 2021). By removing barriers that they might face, widening participation policy aims to improve their access to education and progression in higher education to raise their life chances. Hence, 'widening' addresses not only the increase in the number of students in higher education but diversifies the composition of the student demographics. This paper applies this notion in examining participatory DRR, with a view that it could contribute to building a democratic society.

In terms of theorising 'participation', there is a rich body of literature. Reed et al (2018) undertook a comprehensive review of participation literature and further proposed a new theory of participation. It is based in the field of environmental management but is 'generalizable' and applicable in wider contexts, as the authors claim. Their approach is to differentiate 'typology' and 'theory': the former being a description of 'different types', while the latter is an explanation of factors for the variation in outcomes. The authors summarise four types of participation: 'top-down one-way communication and/or consultation', 'top-down deliberation and/or coproduction', 'bottom-up one-way

communication and/or consultation', 'bottom-up deliberation and/or coproduction'. The typology addresses 'agency (who initiates and leads the process) and mode of participation (from one-way communication to coproduction)'. One important finding here is bottom-up and co-productive types of initiatives are not always the best option, despite it being the mainstream assertion in the DRR community. They propose 'the wheel of participation' model so that stakeholders could identify 'the appropriate type' depending on the purpose and context. The authors then develop a theory of participation with four factors – context, design, power, scalar fit – which determine the outcomes of participatory initiatives (Reed et al., 2018). Maskery (1989) identified the significance of 'context' in community participation. Understanding local socio-economic, cultural and institutional contexts are critical in achieving beneficial outcomes. A well-thought-through 'design' with systematic representation and opportunities for engagement allows effective management of 'power' dynamics. Both temporal and spatial scales need to match the programme goals. An ecological agenda or anything that requires conflict resolution may take time. The spatial scale is about the knowledge of the right jurisdictions of authorities in tackling the issue.

The discussion on the division between 'typology' and 'theory' is beyond the scope of this paper. What is relevant here is the existing participation discourse addresses either of these two themes – types of participation or 'success' factors. The paper proposes an examination of the challenge of widening participation would also be significant particularly for those initiatives that are going well. Such perspective is pertinent in countries like Japan where participatory and community-based approaches in DRR have been widespread. The government and interest groups have created awards to celebrate achievements and promote more engagement. Accumulated knowledge and experience are shared via government websites, media programmes, as well as in academic publications. Many cases are likely to score 'high' in Reed et al's criteria for the effectiveness of participation bringing beneficial outcomes with an appropriate and workable design that reflects the local contexts having the right size and partnership. Discussing factors for good practices is valuable; it is also meaningful to investigate what good practices do to become even better. Particularly, the paper's focus is that it is usually the case some proactive enthusiasts participate in DRR initiatives, while non-participants with less interest in DRR remain uninvolved. How to get the latter group of residents involved tends to be a common challenge in many communities.

The paper also suggests that in Japan, *machizukuri* 'community development [*machizukuri* or *chiikizukuri*]' policy is promoted as one of the avenues for building a democratic, resilient and sustainable society. The Ministry of Infrastructure, Land, Transport and Tourism originally introduced *machizukuri* in 2001 as an infrastructural planning strategy in promoting citizens' participation in the policy making process. Some initiatives are led by citizens while others are a collaboration between citizens and the municipality, often involving the private sector. 'Machi' refers to 'a town' ('*chiiki*' refers to 'a community') and 'zukuri' derives from 'tsukuru' which is 'to create' – this shows the underlying democratic aim for citizens to engage in the development of their towns. The background to this is three broad societal phenomena: 1) depopulation and the arrival of the super-ageing society, particularly in rural areas, 2) the sharp decline of local industries across the country since the economic Bubble Burst at the beginning of the 1990s, 3) an increase in indifference towards own community in populated megacities (Kanto ICT Promotion NPO Liaison Council [Kanto ICT Suishin NPO Renraku Kyogikai], 2008).

In responding to these challenges, coupled with the shrinking resources in administration, the government undertook 'the Merger of Heisei (Heisei refers to the era of Emperor Akihito between

1989 to 2019)', resulting in the number of municipalities decreasing from 3,232 in 1999 to 1,718 in 2014 (Nishida, 2016). The government promoted the idea that new cities and towns should take the merger as an opportunity and engage in developing attractive communities. This was how *machizukuri* came into the policy domain. Initially, many municipalities set up *Machizukuri* Council [*kyogikai*], to which citizens are encouraged to participate in making decisions around the maintenance and conservation of the town or city. Some municipalities have sub-councils at the ward level, which tend to tackle social aspects of *machi* such as health and welfare, education and DRR, depending on the characteristics and needs of the area (Discussion Group of Municipality Mergers, 2007).

Thus, *machizukuri* has increasingly become an umbrella policy in many municipalities integrating DRR with social agendas such as health, welfare and education (Morikuri, 2018). Participating in DRR is about developing resilience and sustainability in your community, as well as learning to protect yourself and the people around you. This is social action contributing to the development of a participatory democratic society. Participation is a condition for *machizukuri*.

5. Four projects
1) Good practices, the common challenge
Despite the positive recognitions the four projects have received, this study has identified one common challenge remains in them. The projects have been led by strong leadership and supported by enthusiastic members. They are certainly the owner of their projects exercising agency. Beyond this core group, however, each project admits a struggle in increasing the number of participants.

Here are some testimonies. For Aruku Project, the researcher mentioned, 'the people represented in Aruku are highly motivated and engaged in DRR *machizukuri*. How to broaden the participation is the challenge.' (AB-R interview) Referring to both Aruku Project and Satsuki Project, the NGO staff member analyses that 'it is difficult to include a wider audience, the rest of the residents don't get involved, not interested in DRR. How to engage indifferent people in DRR is always difficult, wherever it is. We tried to have a booth in a shopping mall. We also try to involve kids in DRR' (AB-N interview). In Miyoshi Ward, the leader reflected, 'at the time of the Evacuation Card Project, there were reluctant people' who were not keen on getting involved in creating the card (C-L interview). The researcher observed that 'I am only seeing "strong" parts of the Nomura community. I am aware I am still missing those who aren't involved' (D-R1 interview). This was confirmed by another interviewee – in reference to the ongoing DRR seminar series, 'The majority is not participating! Those who participate is 30-100 out of 4,000', e.g. in a seminar series. 'I am not necessarily trying to encourage more people to participate. It takes energy to persuade people to participate (D-LO interview).' These testimonies commonly show the struggle of the projects to attract a wider audience and achieve a larger number of local residents to get involved in the projects despite demonstrating good practices. Motivating more residents to participate is significant in the realising of a democratic society. This common challenge is worth exploring in deepening the discussion on participation.

The following sections present the findings as to what strategy each project uses in widening the participation after describing their DRR activities.

2) Aruku project, Kawabe Ward, Mabi Town, Kurashiki City, Okayama Prefecture
a) Aims and activities

The full title of the project is Kawabe Recovery Project Aruku. Kawabe Ward had 99% of its households inundated above floor level by the 2018 flooding. Aruku Project aims to develop activities which 1) develop connections and friendships amongst residents and also their passion for life [*ikigai*], 2) create a safe community, 3) retain the disaster experience and prevent it from weathering. The project now has a permanent office offering social spaces for the people of Kawabe (Kurashiki City Social Welfare Council, 2021). Starting with 20 'friends' in Group LINE (social media platform widely used in Japan), the number has now gone up to 600. Municipal officials are included as well (A-L interview).

The project began by one person shortly after the flooding occurred on 9 July 2018. She started Group LINE with 20 friends asking what they needed. She wanted to reach out to those who were facing difficulties. Her situation was better being able to evacuate to her parents living next to Kawabe and all essentials were available to her family. LINE became a platform to exchange vital information such as where temporary toilets were in Kawabe. 'Friends' rose to 100 that evening. The friends started to mourn they would not return to where they had lived. Kawabe did not have a support hub. There was little motivation for recovery. Residents had to travel to receive a donation. So she started a food bank in Kawabe involving a local MP. At the end of August, 300 people queued for the food bank. Interestingly, queuing often started 2 hours before the food was served. People wanted to get together and have a chat. Kids were playing cards. 'Space' was needed. By September, the number of LINE friends became 300, and Aruku Project was launched in October with 20 volunteers who wanted to give hands (A-L interview).

The shift to get involved in DRR occurred one year after the disaster. According to a member of the NGO, 'the driving force for DRR was Aruku members regret not being able to help neighbours who passed away. One year on, they strongly felt they were obliged not to repeat the same mistake' (AB-N interview). The people in Kawabe were also showing a rising awareness in DRR through LINE surveys the project undertook. The survey response during the first six months after the disaster was dominated by demands requesting help, but the contents gradually included forward-looking and proactive comments on DRR (A-L interview). Aruku Project is now focusing on DRR activities. In fact, at the time of our visit, the members were considering removing 'Recovery' from the project title given it has been more engaged in DRR lately (A-M1 interview). Responding to the survey results, the project has introduced a range of DRR activities. For residents' request that they want to learn more about DRR, informal classes (Bosai Café) and seminar series (Bosai Future [*Mirai*] Meeting) were introduced.

Figure 6: Bosai Future Meeting of 31 October, 2021

Yellow Ribbon [*Kiiroi tasuki*] was developed for safety check in emergencies. The activity is to tie the ribbon at the entrance of your property to show you and your family are safe. No ribbon indicates someone has to call out for [*koe kake*] the residents inside and offer support. This idea stems from

the community's regrettable experience of not calling out enough during the 2018 disaster or taking too long to reach out to those in need of help. As the leader explains,

Official risk communication covers a wide area. We didn't understand the information and link it to our own behaviour. The trigger might be a top-down instruction, but what to do next is up to us (A-L interview).

Kawabe Ward had 1,700 households before the disaster, which came down to 1,500, of which 1,300 had a yellow ribbon distributed in March 2021. In May, the project organised a safety-check drill in which 65.8% out of 1,300 took part. Some of the neighbourhood associations which had not been involved in community development wanted to join the Yellow Ribbon drill. The later online survey showed 68.8% had seen a ribbon being put up at other households. Some of them said they had gone home to tie the ribbon outside (A-L interview).

Figure 7: Yellow Ribbon (asahi.com, 2021)

Another innovation is Family Diary [*Oyako Techo*]. One survey asked mums and dads in Kawabe what they wish to convey to people in different parts of Japan who have not experienced a water disaster. Aruku Project summarised their tips for protecting family and livelihood as Family Diary. For example, the section 'My evacuation destinations' is for the family to identify at least three destinations depending on the hazard situation – where you can stay for a while, outdoor in a tent or car, when parents are not around, official evacuation shelter. This stems from an important lesson learned by many people in Kawabe, including the leader of the project. Her family was back and forth wasting time discussing what to do. 'In hindsight, we should have gone to my parents straightaway!' (A-L interview). The other challenge her family faced was 'the authority's area mail "the river was collapsed" was not helpful not knowing what I should do. More personalised action has to be discussed.'

Kawabe didn't have an evacuation centre, nowhere to evacuate – residents were relying on top-down instruction and hard measures. Not like that. We need to think about how to save our lives. It is our responsibility to question and make changes (A-L interview).

For this reason, the recommendation to decide the timing of own evacuation is included in Family Diary. As Yamori et al. (2018) advocate, 'My Own Signal' is a DRR strategy to personalise the timing and destination of evacuation when a flood occurs (Yamori et al., 2018). As Aruku leader says, 'DRR messages actually need to be targeted to *you*'.

b) 'Participation is contagious' as a widening strategy
Through information sharing and organising learning events and leisure activities, Aruku Project has supported many aspects of the recovery and preparedness process in Kawabe Ward. Starting from scratch, Aruku Project came to appreciate Kawabe's people showing interest and getting involved

knowing others were involved. LINE contributed to increasing participation is available to all. Group 'friends' include the elderly in the 70s and 80s. The project helped them to install the app and learn how to use it. Those who are on their own worry about isolation but feel connected through LINE. By sharing the same thing, a sense of 'we can help each other in case of an emergency' has been strengthened (A-L interview).

Yellow Ribbon is also a demonstration of participation being contagious. Some of the neighbourhood associations which had not been involved in community development wanted to join the Yellow Ribbon drill. The later online survey showed 68.8% had seen a ribbon being put up at other households. Some of them said they had gone home to tie the ribbon outsides (A-L interview).

At the 8th Mirai Bosai Meeting, the chairman of Kawabe Ward Machizukuri Committee made the following comment: 'Kawabe is doing great. But always by the same members. We need to involve a wider population'. Responding to this point, the researcher indicates in the interview, 'the challenge is it takes time. I used to think the same. Let's not hurry'. She reflects, Yellow Ribbon was 'a turning point' for Aruku Project. 'More than 60% participated, which is a very good result. I felt this was OK. It was proof of people's awareness going up. It also was an opportunity for Aruku members to be reassured that they were doing right (AB-R interview).' The Yellow Ribbon activity demonstrated a mutual effect, i.e. one's participation influences other's participation. Many said, 'I will evacuate next time' (A-L interview). Having discovered that participation can be contagious, Aruku Project intends to make the most of this to increase the number of participants in Kawabe in preparing for future disasters.

3) Satsuki Project, Yata Ward, Mabi Town, Kurashiki City, Okayama Prefecture
a) Aims and activities
Satsuki Project aims to build an inclusive cooperative community with an introduction of a new residential block that entails evacuation functions. The block has a nickname 'Satsuki Apart' – 'satsuki' means azalea, the symbol flower of Mabi Town. The project is run by Team Satsuki, which is a loosely formed interest group comprising the founder of a local nursing home, voluntary organisation for community development, a DRR researcher, Social Welfare Council (Kurashiki City Hall), an NGO for disaster support and many more. The project derived from the issue of non-evacuation by the elderly and people with disabilities. Out of the 51 fatalities in the 2018 disaster in Mabi Town, 22 persons lost their lives on the ground floor not being able to evacuate vertically despite living in two-story buildings. The project identified three lessons learned from the disaster experience: a) 'a disaster can occur any time. We need to prepare now for our super ageing society'; b) 'preparedness of both infrastructure and lifestyle are important'; c) 'disaster survivors are also co-creators of the community having something to offer'. To materialise these lessons, the project turned an inundated two-story apartment block, which was donated by its owner, into an innovative residential block adding evacuation functions. One function is the external long slope which enables wheelchairs or mobile beds to reach the upper-floor shelter space easily in the time of flooding. The shelter space is also a communal room, which is for social use for the block's residents and also neighbours. The residents also decided in the project the stockpile and emergency kits, which are kept in the room (Budo no Ie, 2021b).

Once the building was completed and some survivors of the disaster moved in and began rebuilding their lives, Satsuki Project has shifted its focus on social aspects. Satsuki Apart's residents discussed how to develop a support mechanism in the block, some of whom have difficulties living on their

own. The emphasis was also put on developing relationships beyond the facility with the neighbourhood as Satsuki Apart's residents were not necessarily from the area. Yata Ward's Machizukuri Committee has been involved in designing and implementing collaborative activities with the ward's wider organisations and residents. The committee leader explains, 'it is important to develop links between Satsuki Apart and the neighbourhood'; 'it is also important to know "the other", to see their faces' (B-M interview). For example, using the communal space in Satsuki Apart, the committee has arranged gatherings for singing to which the residents and neighbours are invited. A potato digging event in which Satsuki Apart's residents harvest potatoes with the children from a nearby nursery was organised. According to the committee leader, Yata Ward's *machizukuri* includes the principles of welfare and 'warm' community-building, as well as DRR, which match with Satsuki Project's mission (B-M interview). Thus building positive intergenerational relationships is a critical aspect of the project.

Figure 8: Satsuki Apart

b) 'Everyday participation' as a widening strategy

In the case of Satsuki Project, its strategy for widening participation is to make an evacuation usual even in time of emergency. As the leader of Satsuki Project says, 'evacuation requires courage. People have a lot of hesitation' (B-L interview). She gives a list of examples: one of Satsuki Apart's residents was to stay at home because he could not move his bedridden wife; a family with an elderly with a memory loss did not want to go to a designated evacuation centre; a paralysed woman hid from helicopter rescue. All of them did not wish to bother others. 'But people can evacuate to a familiar place (B-L interview).'

The more often Satsuki Apart's residents and neighbours go to the communal room on the upper floor, the more confident they become of this action, i.e. evacuation. Gathering at Satsuki Apart for social and leisure purposes and joint local events allow them to get to know each other (B-L interview; Budo no Ie, 2021b). Regularity and familiarity reduce psychological and physical barriers.

There was an opportunity to test the objectives of Satsuki Project. In another heavy rain of 2020:

Residents and neighbours evacuated to here [the communal room], had a chat and a cup of tea, and nothing happened. They went home saying "it was fun!". If an evacuation was difficult, people don't want to do it (B-L interview).

In this way, evacuation becomes no longer a burdening and exceptional matter, but an everyday act. This approach resonates with what Yamori refers to as 'lowering the hurdle' of DRR actions (The Yomiuri Shimbun, 2022).

Satsuki Project's leader goes on to indicate that a super-ageing society like Japan will be a safer place 'if a multi-function communal facility like Satsuki Apart is set up every 500 meters across the country' (B-L interview). There is a reason for '500 meters', which is the distance wheelchair users and people with a cane can move in one go. Moreover, 'post-reconstruction is costly. This kind of building (Satsuki Apart) doesn't require so much and can be built quickly. It is a more sustainable model' (B-L interview).

4) Evacuation card project, Miyoshi Ward, Ozu City, Ehime Prefecture
a) Aims and activities
Historically, Miyoshi has faced inundation water, which led to 'bitter experiences' (C-L interview). The 1943 disaster washed all houses away, damaged agricultural products completely and killed a firefighter. Protecting residents and agriculture is a matter of survival for the people of Miyoshi. In 2006, a voluntary disaster prevention organisation [jishubosaisoshiki] was set up in Miyoshi Ward as the first case in Ozu City. The association then led the creation of the disaster prevention management plan completed in 2015. Their proactive attitude in DRR was also demonstrated in their application for the Cabinet Office's Disaster/Evacuation Card Model Projects in 2016 (Kubota, n.d.). Miyoshi Ward was selected and developed two types of evacuation cards – a business card type and a leaflet type – through three community workshops. Eight groups were formed according to the possibilities of inundation identified from the 1943 event to discuss evacuation actions in the workshops. In the third workshop, using the evacuation cards, the groups took part in an evacuation drill and revised the contents of the cards afterwards. To disseminate the evacuation cards to every resident in Miyoshi Ward, the neighbourhood association and the voluntary disaster prevention organisation requested 17 sub-wards to hold another workshop separately in 2017. The detailed information such as your temporary shelter and whom you will call out was filled into everyone's card, which was put into a strapped plastic case to be hung, for example, on the fridge at home to make it visible (C-L interview).

Despite the damage caused by the Heavy Rain Event of 2018 which was the largest in the post-war time, Miyoshi Ward was able to achieve no fatality. When the torrential rain began, the members of the voluntary disaster prevention organisation set up a countermeasure headquarters at the public hall [kominkan] which was one of the designated evacuation shelters. They collected the information on the rainfall and the dam situation and also called for evacuation to residents using local cable broadcasting, which prompted their evacuation. The headquarter later assessed the risk of the public hall being flooded and the timing of the secondary evacuation. The evacuees all moved to a substation facility on higher ground. The public hall was later inundated. During these evacuation processes, the Evacuation Cards were deemed effective. Residents were able to collect those whom they were supposed to give hand, which had been decided in the workshops and noted in the Cards (Fire and Disaster Management Agency, 2021). Owing to the Evacuation Card Project, 'every resident has been able to learn the importance of protecting one's life by oneself' (Kubota, n.d.). 'We have a high awareness of water disasters and a strong motivation to protect ourselves against them (C-L interview).'

Figure 9: Disaster/Evacuation Card (Asahi Shimbun, 2018)

b) 'Participation through invitation' as widening strategy

DRR activities in Miyoshi have been undertaken under the leadership of the chairman of the neighbourhood association and the president of the voluntary disaster prevention organisation (C-M1 interview). The development of the disaster management plan or the Evacuation Cards would not have happened without the leadership. However, the leaders were aware there was no point in forcing residents to take part in the activities. As the chairman said, 'not that the plan was created only by certain seniors or executives in Miyoshi' (C-L interview). Using cable broadcasting, the leadership team invited residents to join the process with the following persuasion:

For water disaster, we know it is coming, unlike earthquake or tsunami. Our communities know the best what is happening in the time of a water disaster, authorities don't. Circumstances differ from community to community. We cannot rely on kojo [public help] (C-L interview).

Between 80 and 100 residents did gather (C-L interview). In the words of the president, 'in Miyoshi, good relationships are already there' (C-M1 interview). Even when some residents showed reluctance in engaging in the Evacuation Cards Project, they were not pressurised. The leaders approached them, explained to them 'we have to do this for survival' and encouraged them to participate (C-L interview). Those who were not keen at the beginning became the ones who appreciated most after going through the flood when the Card saved them. 'We invited everyone to the workshops, those who were interested attended them and many of us studied together. This means there is always someone in the neighbourhood, who is familiar with DRR' (C-L interview).

5) Citizenship Education Project, Nomura Town, Seiyo City, Ehime Prefecture
a) Aims and activities

Together with the other four towns in Seiyo City, Nomura Town has been guided by Seiyo City Hall in the recovery processes since the 2018 disaster. Nomura had the largest damage in the city – five out of six fatalities, and 919 out of 1,367 damaged households including fully destroyed (Seiyo City, 2019). The population in the town did not really have a DRR awareness before the disaster (D-LO interview) and therefore has relied on the authority's leadership. Despite such a top-down formation, the city hall's intent was collaborative from the onset, presenting three principles in the city's recovery *machizukuri* plan issued in March 2019: let us take time to recover from worry and grief by 'standing next to each other and supporting one another'; recovery is about 'one step of 100 persons, rather than 100 steps of one person'; all stakeholders including the public administration need 'to prioritise carefully what has to be done' (Seiyo City, 2019, p. 17). Based on the city's plan, Nomura Town developed its breakdown plan in October same year.

This paper treats two initiatives as one Citizenship Education Project although they derive from different objectives in the town's plan, given that they aim to foster public responsibility as well as disaster awareness in Nomura's next generations. One emerged through the infrastructural *machizukuri* strand, which discusses the utilisation of the spacious riverbed of Hiji River that was inundated. After a series of workshops, the people of Nomura decided to develop vegetable, fruit

and flower farms, a public park and sports fields. In the discussion process, the researcher whose expertise is environmental engineering came up with an idea to involve Nomura High School. Its Investigatory Hour [*Tankyuu no jikan*], which is a field-based active-learning lesson, has been allocated for the planning and implementation of a project. A group of students chose to lead the management and maintenance of the farms (19/11/21 observation; D-R1 interview). When we observed their class at the high school, students were creatively discussing the dishes using the harvested sweet potatoes, which were to be served at the approaching main festival in the town (19/11/21 observation).

Figure 10: Investigatory Hour at Nomura High School

The other is part of the DRR education initiative called 'Learning From the Disaster' package lessons that Seiyo City coordinated for schools (Seiyo City, 2021). We observed a lesson delivered at Nomura Primary School, which uses its Integrated Study hour for DRR education (19/11/21 observation). A citizenship education expert from a university is invited to give lessons on DRR education with a focus on fostering citizenship. The primary school lesson had group discussions about the school's stockpile storage – what to write on the note which will be displayed on the storage to inform evacuees what to do. An official from the city hall was there offering feedback with a view to borrowing some of the pupils' ideas. Such procedure had been discussed between the school, the city hall and the researcher on the basis of their belief that pupils have a stake in society and want them to understand so (Inoue, 2020).

b) 'Education for participation' as widening strategy
Both educational activities at the high school and the primary school share a common theme; that is, becoming a citizen through social participation. It can be suggested that the Citizenship Education Project in Nomura Town deploys citizenship education as a widening participation strategy to foster proactive citizens who engage in social actions having high DRR awareness. Starting early targeting young people and children is often regarded as an effective approach in cultivating DRR readiness (Mutch, 2014). The emphasis in the Citizenship Education Project is the respect towards the learners' participation without imposing a piece of knowledge or a behaviour pattern. The project applies such methodology to teach the importance of raising a voice and the approval of expressing an opinion whoever you are in society. The ministry of education and educational expert has been revising the conventional knowledge transmission model of teaching and learning. Alternative perspectives such as active learning, child-centred learning have been promoted. Particularly since the lowering of the voting age from 20 to 18 introduced in 2016, the emphasis on citizenship education has been increased (Inoue, 2018). The learners then receive affirmation and approval from adults – the city hall giving feedback and taking pupils' ideas on board, and customers paying for self-made dishes and enjoying them at the festival. These positive experiences encourage the learners to further engage in social activities (Inoue, 2020).

Table 5: Summary of the strategies of the four projects

Location	Kawabe Ward, Mabi Town, Kurashiki City	Yata Ward, Mabi Town, Kurashiki City	Miyoshi Ward, Ozu City	Nomura Town, Iyo City
Project title	Aruku Project	Satsuki Project	Evacuation Card Project	Citizenship Education Project
Disaster experience	Historically had floods	Historically had floods	Historically had floods	Little
Disaster cycle	Relief, recovery, preparedness	Recovery, preparedness	Preparedness	Recovery, preparedness
Project aim	DRR, machizukuri	DRR, machizukuri	DRR	DRR, machizukuri, citizenship
Key activity	**Organising leisure activities, seminar series, Yellow Ribbon, Family Notebook**	**Satsuki apartment**	**Evacuation card**	**Disaster education lessons, community farm**
Strategy for widening participation	**Participation is contagious**	**Everyday participation**	**Participation through invitation**	**Education for participation**

7. Discussion

These four projects demonstrate that a gap exists between the regular participants of the projects and those who do not participate. This paper suggests this gap should be considered as a spectrum ranging from 'core' participants to 'marginal' participants and to 'non-participants', not as an either/or option ('regular' or 'not participating'). In this spectrum, core participants promote the involvement of non-participants using various strategies, e.g. 'everyday participation', 'participation through invitation'. As indicated by many interviewees, eliminating non-participants is unrealistic (A-L; B-L; C-L; D-LO; AB-R; AB-N; D-R1 interviews). But all projects have aimed to reduce its number.

It is important to emphasise that the spectrum is not a normative judgement. The paper does not consider core participation as a better form of participation than marginal participation. Such a view could lead to core participants being 'good' citizens, whereas non-participants are 'bad' ones. Judging civic participation from one dimension – whether one is participating in a particular project – is not feasible.

All projects involve marginal participants, who are diverse. For Aruku Project, hanging the yellow ribbon outside of the house is a form of participation. Even though it is a simple behaviour, we consider it as a starting point for social participation demonstrating one's agreement with the necessity of collaborative DRR action. As to Satsuki Project, the neighbours and Satsuki Apart's residents who gathered in the communal room because of the heavy rain are all participants making their own decisions to evacuate. The attitude of those participants who were persuaded by the leader to join the workshops in the Evacuation Card Project shifted from reluctance to affirmation – this hints people's participation may change in due course. Guided by teachers, researchers and officials, the elementary and high-school students in Nomura Town were learning what social participation would be.

The perspective of core-marginal-non participation has a resemblance with the notion of 'legitimate peripheral participation (LPP)' in the 'communities of practice' theory (Lave and Wenger, 1991). 'Communities of practice' are defined as 'groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly' (Wenger, 2009). For this definition, some DRR researchers who consider DRR activities as learning argue stakeholders in participatory DRR as a community of practice. Citizens who are participants who learn about DRR experience a transfer towards full participation, with the support of expert researchers who are part of the community of practice (Iwahori et al., 2017; Shiroshita and Yamori, 2011). The transfer is in fact the process of identity formation from a novice towards an expert. Iwahori et al. (2017) examine the shift in volunteers' identity at a disaster science museum from novice volunteers to 'semiexperts' obtaining specialised knowledge from seismologists. The authors argue that the volunteers' participation shifted from peripheral towards full participation.

The paper agrees with the authors' analysis in this specific project but would suggest not all participatory DRR initiatives involve the same trajectory. The four projects we studied do not necessarily aim to develop 'experts'. Within the broad spectrum of participation, some participants remain 'marginal', and that is fine. The following statement about couple residents from one of the core participants in Satsuki Project confirms this aspect of participation taking the couple residents as an example:

I believe everyone has a role. Mr anonymised's wife who is in bed has a role as well. Her role is to make her husband alive and keep going. Everyone has a role. Where to exercise the role is in the community, which I think is to mean participation (B-L interview).

Another varying point emerging from our study with regards to the role in the project is that of researchers. The above case of the disaster science museum has seismologists as 'experts', while the researchers in the projects we examined – apart from Miyoshi Ward's project which did not involve researchers – do not possess a strong 'expert' identity.

We are equal partners – researchers, officials and local residents. What we university could do is to support them. I am also a participant, not an instructor. I am enjoying it (D-R1 interview).

The researcher in Aruku and Satsuki Projects also refer to 'enjoyment' and a sense of belonging (AB-R interview). These reflections indicate the slightly different positioning of the researchers between the disaster science museum project and our study's projects. The difference may derive from the fact the former focuses on the learning and disseminating of seismic knowledge, while the latter aims for *machizukuri* through the recovery from the flood disaster. This speculation requires further investigation.

8. Conclusion

This paper concludes by discussing two broad overarching emphases that could be transferrable in widening participation beyond the context of Japan. The first is the idea of 'lowering the hurdle'. For non-participants, the hurdle of participating in DRR activities is high. Previous research has illustrated why people do not get involved in DRR including CCA. One obvious response is a lack of time and resources. 'The normalcy bias' (Omer and Alon, 1994) – the denial that 'a disaster will not happen to/affect me' – is another. When people perceive they are compelled to participate, they tend to show reluctance or resistance (Yamori, 2011). Lowering the hurdle is about making it accessible,

approachable and embedded in daily life. The Yellow Ribbon activity conveys a clear message of safety through the simple act of hanging the ribbon at the door. Frequent social gathering at Satsuki Apart has become an everyday routine, which makes no difference to an evacuation action. Taking a small concrete step as such, rather than embarking on a grand design of a community-based plan, appears to encourage people to get involved.

The other emphasis is relational significance. Some key expressions surfaced during the study that characterises the present measures of DRR including CCA in Japan. 'To be connected [*tsunagaru*]' is probably the most frequently used term. 'Creating a space [*ba o tsukuru*]' is an associated phrase, which refers to a means to allow people to be connected. The larger the number of familiar places or places to visit people have, the better their health and safety will be. Such an attempt was illustrated at Satsuki Apart with the social gathering space. When a disaster occurs, 'calling out [*koe kake*]' each other becomes critical to support the vulnerable and identify who is silent and therefore needs help. In Miyoshi Ward's Evacuation Card Project, the residents decided who should call out whom in an emergency. In the 2018 flooding, following the plan, they called out the ones they were supposed to call out (C-M4 interview) resulting in no victim. For the response and recovery phase, 'standing by side [*yorisou*]' is used as a manner to support those who are affected by a disaster. '*Yorisou*' literally means 'to snuggle' but has been used in the context of health and welfare and increasing in DRR 'to be there', not physically but psychologically. These phrases are all repeatedly used in the policy domain, academia and media forming a powerful social discourse stressing the 'people first' (Ferdinand et al., 2012) approach in DRR and *machizukuri*.

The paper recognises the danger of implementing the approaches of 'lowering the hurdle' and 'people first' without cautious consultation of the context. However, it is suggested that these practices contribute to widening participation in community-based DRR including CCA.

Authorship contribution
Kaori Kitagawa was the main researcher in designing research, arranging fieldwork and constructing this paper. Subhajyoti Samaddar contributed to the theoretical and technical aspects of the paper. Both researchers collected the data in the four field sites.

Data availability statement
The data is not made available due to ethical reasons.

Declarations and Conflict of Interests statement
- **Conflicts of interest** We declare there are no conflicts of interests or competing interests.

- **Ethics approval** We have obtained approval from UCL IOE Research Ethics Committee (REC1555).
- **Consent for publication** We have secured informed consent from all research participants to participate in the study and to publication.

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