Engaging communities in managing multiple hazards: Reflections from small islands in North Sulawesi, Indonesia

by Mercy Maggy Franky Rampengan

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Mercy M.F. Rampengan,[1,2] Lisa Law,[3] J.C. Gaillard,[4] Agni Klintuni Boedhihartono[3] and Jeffrey Sayer[3]

[1]College of Marine and Environmental Sciences, James Cook University, Queensland, Australia
[2]Faculty of Mathematics & Sciences, Manado State University, North Sulawesi, Indonesia
[3]College of Marine and Environmental Sciences, James Cook University, Queensland, Australia
[4]School of Environment, The University of Auckland, Auckland, New Zealand

Correspondence: Mercy M.F. Rampengan (email: mercy.rampengan@my.jcu.edu.au)

Participatory methods are a common approach for giving voice to local communities in hazard and disaster research. Drawing on a study that trialled and modified a range of participatory methods in North Sulawesi, eastern Indonesia, this paper reflects on how such methods help document the capacities of small island communities. We assessed capacity from a sustainable livelihoods perspective, identifying the assets that enable villagers to cope with hazards. This overall approach promoted a discourse of strengths and resourcefulness, contrasting with vulnerability and needs-assessment approaches common to government and non-governmental organizations, which tend to focus on weaknesses and can sometimes fuel undeliverable expectations of funding. We provide a critical reflection on participatory methods and their significance for researchers, policy makers and funding agencies working with communities in hazard-prone regions.

Keywords: participatory methods, capacity, hazards research, small island communities

Introduction

This paper is a critical engagement with the endogenous capacity of local people to face natural hazards and disasters. We assumed that people are capable of helping themselves in facing hazards, in rebuilding their livelihoods and in reducing future disaster risks should a disaster occur, and that this ability needs to be officially recognized in development policy and research (Anderson & Woodrow, 1989; Chambers, 1994b; Gaillard, 2010). This paper aims to position local communities as agents with the ability to cope with hazards and build their livelihoods with their own resources. Scholars such as Campbell (2009) argue that small island communities have a high capacity to deal with various hazards through using their 'traditional knowledge'. Baldacchino (2005) likewise explains island advantages in terms of strong social capital that facilitates 'good governance' practices and in many cases allows island people to achieve an enviable standard of living. Indeed, small island peoples commonly evolve into distinctive cultures and retain a strong connection to their homeland and culture (Beller, 1990; Giavelli & Rossi, 1990; Hanson & Lamson, 1990). This connection undoubtedly provides advantages in the face of disturbances, whether these are cultural or natural (Giavelli & Rossi, 1990).

Identifying inherent capacities in small island communities is critical to putting in place any risk reduction strategy. As argued in detail below, this approach is far more strategic than the more familiar practice of government and non-governmental organizations' of documenting vulnerability. Although research addressing the root causes of vulnerability is obviously needed (Wisner et al., 2004), it is not the focus here.

Instead we suggest that recognizing and valuing capacity can help reduce risks in the long run (Cannon, 2008; Gaillard, 2010; Wisner et al., 2012) and that reinforcing local capacities should be a key element of any disaster risk reduction programme (Mercer et al., 2007; 2009). The recent proliferation of various Community-Based Disaster Risk Management programmes (i.e., Community-Based Disaster Preparedness, Community-Based Disaster Risk Reduction, Integrated Community-Based Risk Reduction, etc.) as an alternative to top-down approaches in disaster risk management shows the importance of endogenous capacities in decision making and other activities to enable people to deal with natural hazards. These programmes promote participation and the involvement of local people, thus facilitating an understanding of the locality and situation of a community through the use of various participatory methods.

In the past decade, various participatory methods have contributed to the awakening of local communities to their potential capacities in reducing risks. Without wanting to diminish the usefulness and significance of participatory methods, we argue that the more general approach adopted by the researchers toward participants is perhaps most important (Chambers, 1994a; Kumar, 2002).This study therefore examines how different approaches even when using the same participatory methods, shape the kind of data collected; it calls into question the assumed alignment between epistemology and methods. These issues came to the fore when a local Red Cross project conducted surveys in the same areas a few months after the research described in this paper. The Red Cross project adopted a similar participatory approach but was designed around the objectives of identifying potential interventions for the Red Cross. Our research was less constrained and sought to improve our fundamental understanding of the livelihood strategies of the people.

Capacities in this study are understood as 'the set of knowledge, skills and resources people resort to in dealing with natural hazards and disasters' (Cadag & Gaillard, 2013: 269). We understand these capacities through a livelihood perspective that emphasizes the resources required to fulfil people's basic needs (Sayer & Campbell, 2004) and that stresses the tangible and intangible resources people use in their daily lives, including during the occurrence of hazards (Chambers & Conway, 1992; Ashley et al., 1999). Davis et al. (2004) similarly define capacities in terms of the assets people own that enable them to resist, cope with and recover from disasters. Assets are thus the basis for coping with threats and uncertainties, responding to opportunities (Chambers & Conway, 1992; Bebbington, 1999), improving relief and reducing disaster risks (Le De et al., 2013). Small island communities have survived for generations in hazard-prone locations, enduring coastal storms, high waves, storm surges, typhoons, tsunamis and erosion. These hazards are regular occurrences and are regarded as common facts of life (Lewis, 2009; Kelman et al., 2011). Communities therefore develop capacities to live with hazards through diversifying livelihoods and maintaining strong social capital. Such capacity to reduce the impact of harmful natural events has been widely recognized in the literature (Gaillard & Le Masson, 2007; Gaillard et al., 2008). Finally, capacity is based on traditional social resources and belief systems that enable communities to cope with hazards and disasters (Giavelli & Rossi, 1990; Campbell, 2006; Gaillard et al., 2008). A bottom-up approach is therefore required to recognize people's perspectives and priorities (Scoones, 2009) and for outsiders to better understand the local context (Chambers, 1994a). However, Shah (2006) explains that appropriate techniques must be used to reach the targeted communities with the right strategies for disaster, risk and vulnerability. Therefore, in this approach, communities are required to be positioned at the centre of the disaster research (Mercer et al., 2010) as well as, ultimately, become

the main beneficiaries of this research (Freire, 1970). As Weichselgartner and Obersteiner (2002: 76) argue, 'disaster schemes and programs still treat people as 'clients' in disaster management processes where science and technology do things to them and for them, rather than together with them'.

This paper documents the use of various participatory methods to explore the capacity of small island populations in facing multiple hazards, using the Indonesian islands of Siau, Ruang and Lembeh in North Sulawesi province as study sites (Figure 1). Siau and Ruang islands are part of the Siau Tagulandang Biaro archipelagic district (referred to by the acronym Sitaro), and Lembeh Island is part of Bitung city. Three villages from the islands were selected for the study: Laingpatehi village (Ruang Island), Kinali village (Siau Island, the principal island of Sitaro district) and Mawali village (Lembeh Island). The differences between these three island villages are striking, especially in terms of the geographical context and economic activities. In Laingpatehi village, the lives of its inhabitants are mostly centred on fishing, and the existence of an active volcano and limited physical space for housing and farming have compelled Laingpatehi villagers to diversify their livelihood strategies. Kinali villagers are mostly involved in cultivating several varieties of cash crops, notably cloves, coconuts and nutmeg. This village is only 5 km from Karangetang, one of the most active volcanoes in Indonesia, and fertile volcanic soils account for the high quality of nutmeg. The third village, Mawali, is close to the city of Bitung on the mainland of Sulawesi. The main asset in Bitung is wage labour. Mawali used to be a producer of several agriculture products, mainly chilli, but has recently shifted to agroforestry (nutmeg, cloves and copra) in response to unresolved pest problems in its traditional agricultural practices. Mawali is exposed to dry-season water shortages, landslides and rock avalanches. The majority of the people in all three villages are of Sangir ethnicity, while most others are connected through marital status, which makes cultural integration less difficult. Studying these villages on three different small islands allows us to examine the interactions between
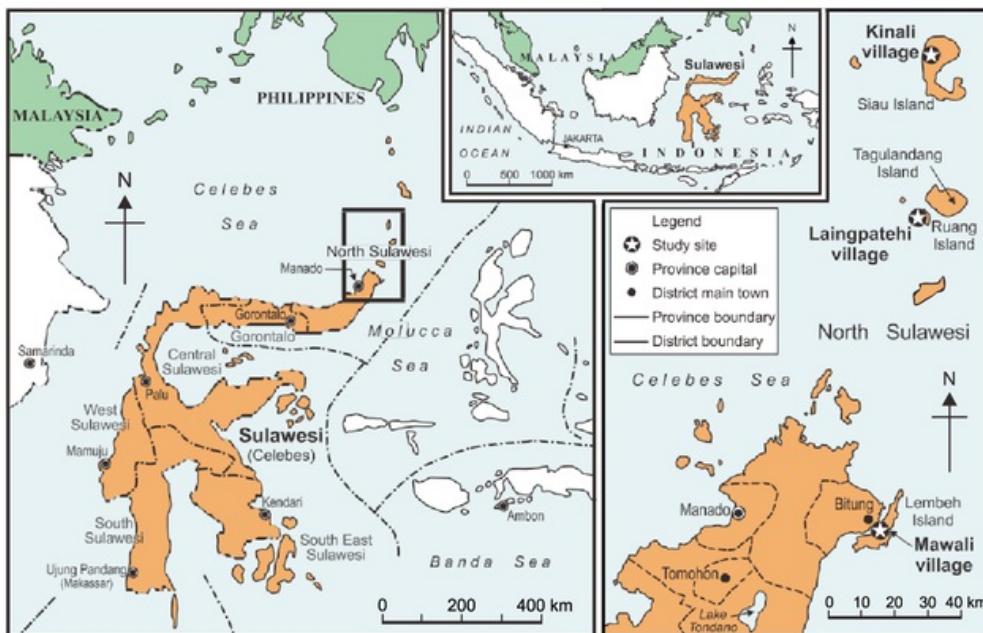

Figure 1. Map of study sites.

a diversity of livelihood activities and a range of local natural hazards and reveals the capacities of the different communities.

The paper reflects upon the tools and processes used for such research and is organized as follows. The first part reviews some of the literature on participatory methods for disaster. The next part of the paper turns to a discussion of approaches in disaster research, evaluating the importance of participatory tools in uncovering community capacity. The third part of the paper presents the results from the study, showing how the data collected from research activities differed markedly from a similar study undertaken by an intervention-focused local Red Cross. The paper concludes by stressing the importance of research approach for researchers and policy makers alike and the importance of the spatial and temporal issues at play in research participation.

Participatory methods for understanding local capacities in disaster research

This section of the paper examines the use of participatory methods to understand local capacities. Participatory methods are perceived as beneficial, as they are 'used with' rather than 'applied to' local communities and thus implicitly tend to take into consideration local priorities and perspectives (Rahman & Fals-Borda, 1991; Chambers, 1994a; 1997; 2002). Participatory approaches to disaster risk reduction tend to be critical of top-down strategies and instead focus on soliciting perspectives of the people affected by hazards as a starting point for research (Wisner et al., 2004). Indeed, top-down approaches are thought to fail, because they ignore the importance of community capacities (Weichselgartner & Obersteiner, 2002; López-Marrero & Tschakert, 2011), involve limited interaction with communities, do not make use of their knowledge and experience of realities in the field and fail to take into account locality and context (Chambers, 1994a; Ivanitz, 1999).

Participatory methods such as mapping, historical trends analysis, matrix ranking, Venn and network diagrams, seasonal calendars, etc., (Kumar, 2002) are interactive and collaborative ways of investigating problems rather than simply posing questions (Ivanitz, 1999). Moreover Chambers (1994a) and Kumar (2002) emphasize that the most important element of a participatory dimension of the methods is the level of engagement with the participants and the attitudes and behaviour of the practitioners involved. Thus, participatory methods clearly need appropriate and flexible approaches to achieve the objectives of a study.

Participatory methods are widely acknowledged as an effective way of undertaking research with marginalized people (Kesby, 2000; Pain & Francis, 2003), including small island communities (Mercer et al., 2008; Kelman et al., 2011). Small island populations are categorized as marginal, as they tend to inhabit geographically isolated locations that can impair their economies, politics and social networks (Gaillard, 2010). Participatory methods aim to involve the most at-risk people, take into account their local knowledge and enable them to use their own words and frameworks of understanding (Chambers, 1994b; Mercer et al., 2009; 2010). But in practice it proves very difficult to provide opportunities to every community member, and it is difficult for alien researchers to fully understand local power relations and engage those usually excluded from regular community affairs, such as women, in research activities that are often organized with the help of powerful local leaders (Le De et al., 2014). Therefore, despite efforts to broaden participation, participatory methods may still not provide equal access to all sections of a community (Mosse, 1994).

Much emphasis has been placed on the involvement of women in participatory activities in disaster studies (Cronin et al., 2004; Mayoux, 2006; Wisner, 2006; Gaillard

& Maceda, 2009). Women might choose not to participate or might take part in participatory activities but not be willing to express their views (Cornwall, 2000). Nonetheless, women were key informants throughout the research activities conducted for this study. Women were present in large and small group activities, but gender did not present itself as a key variable in terms of how the community voiced its concerns. This study therefore confirmed Cornwall's (2000) 'optimum participation', where participants may not have reflected the full social diversity of local communities but rather an optimum in the context of the objectives of the study (Patton, 2002; Bradshaw & Stratford, 2005). A more in-depth involvement with fewer but more diverse participants (including women) was seen a[22]eal, but it was impossible to give everyone an equal voice in the process. Moreover this study included the use of other methods (semi-structured interviews, observation and secondary data) that are not discussed in detail here.

This study trialled and modified a range of participatory methods to document how small island communities respond to multiple hazards. The basic principles of participatory methods include bias offset, rapid progressive learning, triangulation, etc., with the possibility of finding out through various experimental practices which principles work best (Chambers, 1994a; 2002). While there are advantages to using these methods, some critics argue that participatory methods are unreliable, impressionistic and biased (Cornwall & Jewkes, 1995). Despite these criticisms, participatory methods do have significant advantages. Pain and Francis (2003) even suggest that criticisms of participatory methods can often lead to positive progress in research, development and policy making (see also Blaikie, 2006). Since the key elements of participatory methods might lie in the research approach rather than the methods themselves, the application of this approach creates personal, political and professional challenges that must be carefully addressed (Cornwall & Jewkes, 1995). This study reflects on these issues as a goal of the research.

Research approach

This section of the paper gives a general overview of the research process. Because 'gaining access to sites... requires time, patience and sensitivity to the rhythms and norms of a group' (Marshall & Rossman, 2006: 77), appropriate procedures were followed throughout the fieldwork, which was conducted in several stages. We organized preliminary visits in November 2011 and January 2012 to gain a basic understanding of the communities and their environment. The first visit was also aimed at developing links with, and getting support from, local government institutions. The second stage visit was from June to December 2012 and aimed at collecting data from communities, government offices, the Indonesian Red Cross (PMI) and local newspapers. The final visit spanned from August to October 2013 and confirmed the findings from previous visits, while at the same time deepening the validity of the findings and preliminary analysis.

Being accepted and gaining access to small island communities in Indonesia can be challenging. The first contact can help to facilitate research, so meetings with the heads of villages and church leaders were held (cf. Swanson, 2008). The use of Manadonese language helped us to gain access to and trust from the communities. The villagers were predominantly Christian and members of one of the biggest local church denominations: GMIST synod, the local church in Laingpatehi and Mawali villages, and GMIM synod, the local church in Mawali village (GMIST stands for Gereja Masehi Injili di Sangihe Talaud or Christian Evangelical Church in Sangihe Talaud, and GMIM stands for Gereja Masehi

Injili di Minahasa or Christian Evangelical Church in Minahasa). GMIST serves the districts of Sitaro, Sangihe and Talaud, which used to be one district in the past (Sangihe Talaud District), while GMIM serves the cities of Manado, Bitung and Tomohon as well as Minahasa and three other districts. Participation in church services and other church-related events was crucial, because the church plays an important role in facilitating activities in the villages, and farming and fishing are avoided on churchgoing Sundays. Hence we presented the purpose of this study during a Sunday service in the local church.

The participatory methods used for this study were drawn from various community participation toolkits (Kumar, 2002; International Federation of Red Cross and Red Crescent Societies, 2007; Dazé et al., 2009) and were trialled and modified during the course of fieldwork. Group activities used existing community groupings (usually church related) and typical informal convening places (i.e., on the beach, under a tree and in the garden) to limit intrusiveness to daily activities. We consulted with elders on the village history. Working with larger groups, as an initial approach, yielded useful information, but this activity rapidly became seen as a disruption to daily subsistence and economic activities, as the meetings required lengthy and in-depth discussion about issues (i.e., mapping). Although the date, time and location were determined with village officers, elders and church leaders, participants often did not turn up on time. The atmosphere in the church tended to inhibit participants to talk freely in an informal way, which ran counter to the purpose of probing deeper into the people's knowledge. Impromptu meetings were therefore held with people going about their daily routine in various locations such as on the beach, in front of houses, under a tree and in the garden, where participants felt more comfortable, had no work scheduled and could talk freely. This approach enabled participants to continue with their daily activities such as cleaning fishing equipment, looking after their small kiosks and gardening, while engaging in participatory activities.

The change of place and time for participatory activities therefore helped create a more accommodating and comfortable athmosphere for participants to share their knowledge. It also helped avoid the 'unjust exercise of power', where people feel compelled to be involved in participatory activities (see Cooke & Kothari, 2001: 4), a scenario that can produce unreliable, subjective and biased results (Cornwall & Jewkes, 1995; Blaikie, 2006). Indeed, participatory activities can sometimes achieve the opposite of the principle of equality, failing to empower the less powerful and creating a tyranny of decision making and control. In this research, when participants did not participate in activities organized by the village head, they were likely expressing their resistance to formal participation that intruded on their lives and livelihoods. While the initial approach might not have been a tyranny-of-control–type scenario, the research was not being responsive to the routines or priorities of participants, and they were resenting or ignoring the meeting times and places of the research. The research thus changed its approach to connect with more everyday spaces and times in participants' routines.

We held several formal and informal meetings with the communities during the last visit to confirm and share our findings. Incomplete information from previous visits was obtained, and meetings in different groups provided an opportunity for triangulation. Smaller group activities were used to reach people who did not attend the bigger group meetings and to get more in-depth feedback especially from elders and religious leaders. These meetings often continued well into the evening. During these meetings the participants were introduced to the way the research framed their histories and capacities, and all the information from different participatory methods, interviews,

observations and secondary data were shared with them. As most villages lack written documentation, the meetings were an opportunity for participants to reflect on their village stories and capacities in new ways. Some villagers took notes at these information sharing events, and some others, including church leaders, requested a copy of the final thesis as a community resource.

Most limitations of this study stem from difficulties of being an independent researcher who is unable to join participants in their livelihood activities or provide follow-up assistance to the communities. However, we used flexible meeting places and a different 'language' of research to overcome some of these limitations. This more flexible research approach maximized the voice of local people and focused energy on portraying local livelihood flexibility and innovation that is often played down in most project-based research. Villagers were interested in the approach, as it helped them to explore more about their own capacities and reflected their pride as islanders and the strengths they had demonstrated for generations in facing various hazards.

Capacity research in action

'Language' of the research and project-based participatory methods

Meeting villagers on their own terms and focusing research on their capacity encouraged many villagers to feel pride. As suggested by Scheyvens and Momsen (2008), the inhabitants of small islands have a strong sense of their economic and cultural resources and desire for that value to be recognized, and social and cultural identity is a glue that holds them together in the face of any threats or disasters (Giavelli & Rossi, 1990; Skelton, 2007). Engaging the community in a positive manner and recognizing their assets enable villagers to speak of their strengths rather than vulnerabilities. This approach in turn promotes a discourse of resourcefulness rather than weakness and victimhood. In Butler's (1997) terms, different ways of speaking to and engaging with the community encourage different kinds of 'subjection'. It provides villagers with a different way of understanding themselves and presenting themselves as 'subjects'. In disaster research, communities are often labelled as 'vulnerable' (Bankoff, 2001): that is, they are labelled as vulnerable subjects prior to and through the process of research. While different members of the community have different needs and capacities and these depend on power relations in the community (which are shaped by class, gender, ethnicity, age, ability, immigration status, etc.), the more general approach to communities has implications for the kind of data collected. Researchers who focus on vulnerability find needs; those who focus on capacity tend to find resourcefulness (cf. Gibson et al., 2001; Cahill, 2008; McGregor, 2009). This distinction is not merely semantic.

In the case of the 2009 typhoon Ondoy in the Philippines, a funding agency that focused on local community capacities and encouraged local communities to play active roles in the rebuilding process avoided dependence on external relief (Hill & Rom, 2011). McGregor (2009) and Cahill (2008) similarly argue that a language of hope and possibilities is important in encouraging communities to seek out opportunities and to reimagine themselves in terms of their strengths, thereby enabling them to explore their options for development.

Respect and recognition are thus crucial factors in exploring people's capacity. When the capacity of the community was a priority to be explored, people tended to be enthusiastic in explaining their capacity. For instance, meetings during this study could lead to intense discussion and last until evening and were very lively and enjoyed by

participants. They appreciated the respect shown by an outsider for their strengths. A similar scenario is examined by Cannon et al. (2003), who document the positive impact of relief projects when development staff show respect for local capacities. Moreover, focusing on the capacity possessed by vulnerable communities leads to positive socio-economic development outcomes (Cameron & Gibson, 2005) and encourages people to take a self-determined development pathway (Escobar, 1995), as these communities are positioned as agents with ability to address hazards with their own resources (Anderson & Woodrow, 1989). Scheyvens and Momsen (2008: 500) likewise stress that by focusing on capacity, one can gain insights into the ability of island communities 'to enhance their standard of living despite the challenges facing them'.

We used participatory methods in this study to explore livelihood strategies and capacities in facing multiple hazards. While discussions of community strength produced information that was useful on its own terms, it was interesting to observe that the participatory methods used by the local Red Cross, which engaged the same communities several months after the conclusion of this research, produced different insights. In these communities (Laingpatehi, Kinali and Mawali villages) and several others, the Indonesian Red Cross (PMI) directed an Integrated Community-Based Risk Reduction (ICBRR) project, to reduce vulnerability and increase the capacity of communities to cope with disasters, hazards and associated risks (PMI Kab. Kep. Sitaro, 2013a; 2013b; PMI Kota Bitung, 2013). The project aimed to mobilize and motivate the villages to develop and complete village action plans that would establish mitigation measures in reducing disaster risks, and towards this end, the PMI used participatory methods such as transect walks, seasonal calendars, Venn diagrams, mapping, etc. (Table 1).

Despite the use of similar methods with the same communities and the broad agreement and complementary nature of the findings, the PMI research did not uncover as much detail about community assets as our work had. Indeed, even though the PMI used a much larger suite of participatory research tools for their project (18 participatory

Table 1. Methods used by the local Red Cross (PMI-Palang Merah Indonesia) and in this study.

No.	Local Red Cross (PMI)	This study
1	Historical profile of disaster & diseases events	Historical timeline
2	Transect walk to document risks & capacities	Concept map
3	Seasonal calendar (monthly)	Seasonal calendar
4	Venn diagram	Venn diagram
5	Transect map of village infrastructure & environments	Livelihood assets
6	Risk & vulnerability assessment	Vulnerability matrix
7	Daily activities (hourly)	
8	Village changes (yearly)	
9	Calender of income (monthly)	
10	Listing & ranking (wealth)	
11	Map of village	
12	Strategies to eliminate social problems	
13	Internal and external vulnerabilities	
14	Disasters and diseases calender (monthly)	
15	Coping strategies of disasters and diseases	
16	Risk, vulnerability and capacities assessment	
17	Problem tree	
18	Solution tree	

tools rather than the 6 used for this study) and enrolled locals in collecting the data, it was surprising that a few relatively major assets were hidden from their final assessment. A comparison of the major assets uncovered by both research projects is shown in Table 2. In Laingpatehi village, for example, some major livelihood developments uncovered through this research but were not recorded in PMI's results included the existence of a satellite village in Central Sulawesi province as an alternative source of income from agroforestry, the changing of the community's fishing boats to access fish pontoons at the temporary camp in Tagulandang Island (where they lived after the eruption 2002), rent-free use of land among the locals, the rebuilding of the village after the 2002 eruption and the role of remittances from sailors. In Kinali village, some community strengths were likewise neglected: a local culture of collecting and sharing fallen nutmeg and a rotating ownership system for crops. In Mawali, the PMI did not collect information on changing of crops and fishing boat types. There is clearly a difference in information obtained from the same community in two relatively close time periods of data collection.

These different findings can at least partly be attributed to the difference in approach toward the community. How the community is understood by researchers is a key factor shaping the results obtained through this research as well as in PMI activities. The PMI 'project', which had to deliver outcomes and funding, encouraged a focus on vulnerability, weakness and needs. The community would have been seen by the Red Cross as a 'beneficiary' of the project and as having 'needs'. From the perspective of the communities, the Red Cross activities in these villages were likely 'projects', and the communities could have downplayed their capacities and highlighted their vulnerability in order to benefit from any future resources the Red Cross might provide (e.g., physical mitigation measures). Hence the PMI research failed to uncover some of the strengths of these small island communities, instead uncovering needs in the community that might be deserving of support. By contrast, this study set out to uncover strengths rather than weaknesses (though it can be argued that both studies are important to understand capacities and vulnerabilities of small islanders). In this study the community is understood as a complex entity with 'capacities' in building livelihood resources. Because this study was not linked to any specific project, there were no ongoing activities such as establishing a particular project related to a disaster risk reduction programme. We explained this situation to the participants during the introduction to the research, which differs from research carried out by government and non-governmental organizations that may have some 'deliverables' for communities.

The misuse of participatory methods is another possible factor that cause the different findings between this research and Red Cross activities (see Wisner, 2010). The Red Cross project officers and trainers might not have had sufficient time to comprehensively explain the use (or misuse) of various tools of participatory methods and to properly describe the results in their reports. This lack of explanation could result in a confusing and improper implementation of participatory tools, thus affecting the quality of information received. Projects with tight time frames often have this problem. The International Relief Development Project noted that insufficient time in running a project caused ignorance of local capacity and a focus only on victims' needs and problems (Cannon et al., 2003).

The role of group size and meeting time and place of participatory activities
Group size, meeting place and meeting time are also issues that impact results of participatory activities. PMI held all participatory activities in formal large group meetings, while this study held smaller informal meeting groups with opportunities for

Table 2. Capacities in three villages documented by this study (TS) and local Red Cross (RC).

		Kinali	Laingpatehi	Mawali
Physical	This Study (TS) & Red Cross (RC)	- Health, education and village office facilities - Early-warning loudspeaker system - Water tanks (rain water) - Public toilet - Church buildings - Evacuation road - Drainages - Temporary shelters - Cars for transportation and evacuation	- Health, education and village office facilities - Early-warning loudspeaker system - Water tanks (rain water) - Public toilets - Church buildings - Evacuation road - Drainages - Temporary shelters - Electricity generator	- Health, education and village office facilities - Early-warning loudspeaker system - Water tanks (from spring water) - Public toilets - Church buildings - Evacuation road - Temporary shelters - Cars
	Only this study (TS)	- Mobile communication devices - Private toilets - Concrete houses (dominant) - Transportation roads - Motorbikes and boats for transportation, fishing and evacuation - Temporary shelters - Bridges - Electricity (24 hours)	- Wells and bore water - Private toilets - Concrete houses (dominant) - Transportation roads - Boats and motorbikes for fishing, transportation and evacuation - Temporary shelters - Electricity generator (4 hours/day) - Satellite village in Central Sulawesi province	- Wells and water pumps - Private toilets - Concrete houses (dominant) - Island ring road (ongoing development) - Motorbikes and boats for transportation, fishing and evacuation - Drainages - Temporary shelters - Electricity (22 hours/day) - Local security guardhouse - Boat jetties (2) - Mobile communication tower - Garbage truck from the government (weekly) - Gasoline engine for boats instead of kerosene
Social	TS & RC	- Mapalus (communal work)	- Mapalus (communal work)	- Mapalus (communal work)
	TS	- Health, education and village office facilities	- Social networks - Neighbourhood ties	- Social networks - Neighbourhood ties

Table 2. Continued

		Kinali	Laingpatehi	Mawali
		- Early-warning loudspeaker system - Water tanks (rain water) - Public toilet - Church buildings - Evacuation road - Drainages - Cars for transportation and evacuation - Temporary shelters	- Kinship ties (Sangihe ethnic dominant) - Connected to the land - Pride - No fishing and farming activities on Sunday - Traditional system of renting land without payment	- Kinship ties (Sangihe ethnic dominant) - Connected to the land - Less activities on Sunday except for religious activities - Traditional system of renting land without payment - Local health fund system - Local building housing fund system
Human	TS & RC	- Strong faith because of intensity of religious activities - Various skills - Active role of village staff, villagers and religious leaders in village development and disaster responses - Health services	- Strong faith because of intensity of religious activities - Various skills - Active role of village government staff, villagers and religious leaders in village development and disaster responses - Health services	- Various skills - Active role of village staff, villagers (including PMI volunteers) and religious leaders in village development and disaster responses - Health practitioners and services
	TS	- Local knowledge and experience of past events - Health practitioners - Improved health status - Higher educational attainment - Strong culture related to the existence of volcano	- Local knowledge and experience of past events - Health practitioners - Improved health status - Higher educational attainment	- Strong faith because of intensity of religious activities - Local knowledge and experience of past events - Improved health status - Higher educational attainment
Economic	TS & RC	- Diverse sources of income	- Diverse sources of income	- Diverse sources of income
	TS	- Community-based rotating credit schemes (including for savings) - Remittances - Markets for agroforest products - High tax payments	- Community-based rotating credit schemes (including for savings) - Remittances - Markets for fish and crops - High tax payments	- Community-based rotating credit schemes (including for savings) - Remittances - Markets for tuna, copra, nutmeg and clove

Table 2. Continued

		Kinali	Laingpatehi	Mawali
		- Relatively continuous production of crops throughout the year - Government development projects in the village (i.e., PNPM) - Yearly mortgage of crop trees - Relatively high price for nutmeg and mace - Saving programme in primary school - Rotating crop ownership within a family - Nutmeg collection - Early reactivating agriculture activities - No cost for crops (agroforest and subsistance), fertilizers and pesticides	- Relatively continous production of copra, cassava and others throughout the year - Government development projects in the village (i.e., PNPM) - Less expenditures - Controlled fish price - Access to fish pontoons - Diverse sources of income	- High tax payments - Relatively continous production of crops throughout the year - Government development projects in the village (i.e., PNPM) - Local private creditor - Easy access to mainland for selling local product - Access to special gasoline station for fishermen provided by government - Availability of several resorts, shipyards in the island and many industries on mainland - Diverse sources of income mostly work outside the village - Tourism industry (resorts)
Politics	TS & RC	- Government development projects	- Government development projects	- Government development projects - The existence of a local non-governmental organization
	TS	- Respected local voice among government officials - Relatively high budget allocation fund from government - Relatively good relationship between village leader and district government - Strong village leadership	- Respected local voice among government officials - Relatively high budget allocation fund from government - Relatively good relationship between village leader and district government - Strong village leadership	- Respected local voice among government officials - Relatively good relationship between village leader and city government

Table 2. Continued

Natural environment		Kinali	Laingpatehi	Mawali
	TS & RC	- Construction materials - Agroforestry trees	- Construction materials	- Construction materials - Subsistence crops
	TS	- Subsistence crops - Local fruit and nuts - Firewood - Local livestock feed - Fishing grounds - Local role to ban cutting particular trees - Fertile soil - Natural fertilizer and pesticide (volcanic dust) - Hot spring water resources	- Agroforestry tree (coconut) - Subsistence crops - Local fruit - Firewood - Local livestock feed - Fishing grounds - Hazards resistant plants - Fresh water (one bore water source)	- Agroforestry trees (nutmeg, coconut and cloves) - Local fruit - Firewood - Spring water - Local livestock feed - Fishing grounds - Local role to ban cutting trees in the steep hills - Diving spots - Tourists destination areas - Relatively calm straits for transportation access

feedback (i.e., to confirm findings). Bigger group activities were difficult because of the inflexible meeting time; schedules were set-up in advance, so participants had to adjust to the meeting time schedules. In addition, participants were not interested in big group activities, because the main community concerns revolve around fulfilling daily needs, not dealing with natural hazards. Hazards are regular occurrences regarded as a common fact of life for small island communities, who have been dealing with such disruptions for generations (Lewis, 2009; Kelman et al., 2011).

The community does not receive direct material benefits and externally facilitated follow-up activities from 'academic' research. By not attending the 'scheduled' meetings, the villagers could do something else (in addition to their livelihood activities farming, fishing or wage labour) that would yield more tangible benefits such as maintaining boats and fishing nets, cleaning up the land around their agroforestry areas and maintaining the trees, collecting building materials around the village or driving ojek (local motorbike taxi). Based on field observations at several regular village meetings, more villagers attended meetings they saw as directly affecting their lives (e.g., regarding clean water management, community empowerment for farmer or fishing groups such as the PNPM or Program Nasional Pemberdayaan Masyarakat).

Small group activities with more convenient places and times for meeting were more successful in facilitating participant-researcher knowledge sharing. A relaxed and informal research situation encouraged many stories and discussions. Figure 2 shows one of the participatory activities in a smaller group held in Laingpatehi village during the second stage of fieldwork. The participants were village staff, farmers, fishermen, construction workers and teachers. The activity was run informally and the atmosphere was friendly, so participants were willing to interact, engage in the discussion and express their opinions, as they felt relaxed and comfortable. Meetings often lasted until

Figure 2. Participatory exercise with a small group at a convenient place and time. This activity was held in Laingpatehi village, Ruang Island during the second phase of fieldwork. Photograph by Mercy M.F. Rampengan, October 2012.

late into the evening without concerns from participants that their activities were disrupted. Opinion sharing and exploring community capacities were the most important part of these meetings, not the detailed map or other exercises. Villagers were more comfortable discussing issues rather than writing or drawing. Makasar (2011) explains that people of Sangir ethnicity have strong oral traditions, which might explain this propensity toward dialogue and the fact that the islands' history was documented by western visitors and colonizers. Therefore, it was often the discussion behind the drawings and maps during the participatory activities that provided the most important information. We took notes on important matters raised during these discussions and discussed and confirmed emerging themes with participants.

Confirming the findings: data validation and respecting the islanders

The final stage of the research, confirming the findings with the community, facilitated triangulation and validated the data gathered during fieldwork. This stage also helped minimize any misunderstanding about particular issues discussed in prior conversations. As the lead author is Indonesian but not an 'insider', this position can shape a different understanding of the issues. It can influence the observation of phenomena, but the researcher him or herself can also influence the outcome of participatory meetings through the use of language, behaviour and culture. Simply by entering 'the field', the researcher changes the social world under study (Mauthner & Doucet, 2003). These potential issues were acknowledged and minimized by using the local Manadonese language; respecting and adhering to local roles and customs; listening to and respecting all villagers, village leaders and elders and religious leaders; and finally, personally disseminating the results of the study to the local communities during the last field visit. We shared and explained all the maps drawn and notes taken in the second round of field work. Then we invited comments from participants and recorded discussions about important issues added by participants.

Triangulation aims to ensure a greater confidence in the findings, because we conducted semiformal meetings to corroborate the initial findings (Darlington & Scott, 2002). The meetings were generally well attended and appreciated by the participants, as they have never felt as positioned and respected as an important source of information. Moreover, these confirmation meetings clarified local viewpoints and helped counter any potential bias. Although participatory methods are a bottom-up approach aiming to reduce the subjective nature of interpretation, the results and conclusions remain the researcher's interpretation (Miles & Huberman, 1994). Spontaneous notes taken by villagers during the meetings provide significant new documentation to their village stories and capacities, as they have no proper written documentation. All documents related to the participatory activities and formal written documents produced, including this article, were left for these communities. The documents could help them to identify the resources and potential resources they can use for future village development programmes.

Conclusion

The use of participatory methods does not guarantee bias-free, objective research, and here we have suggested how participatory methods can yield different results depending on different approaches to the community. It should be stressed from the outset that research conducted by large organizations is often under time constraints, whereas this research is more attuned to issues of place and group size and how they affect the quality

of data. But the point is not to suggest that our methods were superior or better executed than the Red Cross; there was much overlap in the data, and the overall findings were similar. The difference lies in the research approach, which strengthens particular kinds of community identities. For the research documented in this paper, the community was considered to have capacity and assets, which enabled positive reflections on livelihood strategies for island life. Conversely, in Red Cross and other disaster project activities, these same community members were constructed as vulnerable and were encouraged to speak of their vulnerabilities—which might have been at the expense of documenting some important livelihood activities.

When researchers uncovering local capacities use approaches that enable local communities to speak of their strengths, communities tend to articulate pride in activities that can be bolstered by any disaster risk reduction programme. Conversely, existing capacities of communities can be overlooked in research that focuses on needs and vulnerabilities. This case is made explicit in the parallel research done by the Red Cross, where communities portrayed themselves in particular ways to attract project funding. In other words, the power relations of the researchers and participants shape the kind of information offered. Approaching communities in positive ways can reveal the benefits of appreciating local capacities as a means to achieve better results in disaster managment programmes, which can be better sustained for future generations, because they build on the strengths of the community. This paper thus suggests a better approach of doing research that benefits governments and agencies wishing to make a positive impact in the realm of development and disaster management for communities.

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