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20.1 Introduction

For too long have communities been used as inputs to the research cycle and not treated as part of the knowledge creation process (Gaillard & Gomez, 2015; Levinson, 2017). Deloria (1973) proclaimed: “*Why should we continue to provide private zoos for anthropologists?*” Deloria’s critique on how research in communities is undertaken reverberates far beyond the 1970s and still strikes a peculiar nerve in the 2010s. So too is the work of Freire (2005) on building community knowledge just as relevant today as it was over four decades ago. In essence, communities remain the most important element in understanding how disaster risk and vulnerability are created and how it can be reduced because they are the ones most affected (Van Niekerk & Coetzee, 2012). Emerging from the 1980s, a shift in focus occurred in the management of disasters and also the role of communities within civil protection and disaster (risk) management. A growing realization from researchers and practitioners alike occurred that a greater understanding of the dynamics of vulnerabilities, hazardous exposure and resilience can only be gained if the knowledge creation process is seated within, and by those effected. Local knowledge and culture needs to be respected, and indigenous and scientific knowledge need not be mutually exclusive. However, limited resources, capacities and technical

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abilities hamper random and spontaneous community-based disaster risk management (CBDRM). Therefore, outside intervention is still needed in most cases.

This chapter aims to provide insight into disaster risk management with a specific emphasis on communities. CBDRM as a research and implementation tool will form the central argument. Although many and varied definition for CBDRM exists, this chapter provides a broad definition which relates to existing research and the body of knowledge on CBDRM. The various elements in CBDRM are highlighted and linkages are made between existing research methods and the CBDRM process. The chapter broadens to an international focus with a discussion of CBDRM examples from across the globe. Gender in CBDRM also enjoys particular attention, and commonalities, differences and constrains of CBDRM implementation are highlighted. However, the literature is fraught with inconsistencies in defining the most crucial element in CBDRM - community. The section to follow will briefly allude to how community can be defined within the broader scope of CBDRM.

20.2 “C” in CBDRM

It is common cause to find reference to community linked to location or relationships. These two characteristics, however, are not mutually exclusive. Even the early research by Durkheim (1964) showed that people develop a sense of community around skills and interests, more than around locality. Therefore, “community” goes far beyond a certain geographical area. Mills (2004) defines community as “*face-to-face groups residing in close proximity to each other, enabling people to have a comprehensive knowledge of each other*”. Mills emphasizes the smallness of scale and relationships which develops because of proximity. McMillan and Chavis (1986) propose four elements to community. Firstly, a community has to have *members*. Membership creates the feeling of belonging. Secondly, a community must be able to *influence*. This relates to the ability of the

group to influence the individual, the individual to influence the group, and the collective being able to influence their environment. Thirdly, McMillan and Chavis (1986) believe that *integration and fulfilment of needs* are key to a community. Therefore, members’ needs will be met by the application of the resources available in the group to address these needs. Lastly, they proclaim that a community “*share emotional connections*”. Emphasis is much more on the connections between people than the physical space they occupy. This argument is aligned with that of Tonnies’ (1925) *Gesellschaft*.¹ Shaw (2012) concurs with the definition of McMillan and Chavis by describing community as “*a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together.*” Therefore, community include aspects, elements and people transcending geographical boundaries. This is even more pronounced in the postmodern connected society than ever before (Lyu, 2012) where members of a community might never actually meet in person. However, within the domain of disaster risk reduction one must assume that physical location remains important. Physical location is linked to hazard exposure and vulnerability, and therefore one needs to take a more ridged stance on the definition of “community”. For this chapter, the definition of McMillan and Charvis will suffice as this has also been used by Shaw (2012) in examining CBDRM. It can also include locality of individuals, and the abstract element of transcendence.

¹Tonnies identifies two forms of social organization: *Geminschaft* (the communal cohesion of pre-industrial village life) and *Gesellschaft* (instrumental relationships formed to pursue individual goals). In the *Geminschaft* approach, community is established based on kinship or a place, and provided emotional support. *Gesellschaft* describes relational communities that have been developed based on some common interests, issues, or member characteristics.

20.3 Defining Community-Based Disaster Risk Management

CBDRM is a participatory process. Communities are actively engaged in the identification, assessment, treatment and planning for hazards and vulnerabilities of various kinds (Krummacher, 2014). The CBDRM process aims to enhance skills and capacities and to build resilience (Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2007). Communities are placed at the center of the research process. Such an approach aims to address local issues, challenges and problems from the perspective of those experiencing it every day. Community empowerment and ownership through, and of, the process is key. Shaw and Goda (2004) emphasize that CBDRM is culture and context specific, and therefore cannot be successfully implemented by “outsiders”. In CBDRM, local knowledge and trust becomes very important. Chhoun (2016) believes that CBDRM should be based on “*total disaster (risk) management principles (from risk assessment, mitigation, preparedness, response and rehabilitation), but also in the application and adaptation of local indigenous risk-coping wisdom and knowledge into risk reduction.*”

Shaw (2012) traces the early developments which lead to CBDRM to Community Based Disaster Management (CBDM) mostly made popular by the work of the Asian Disaster Preparedness Centre (ADPC) and a number of Asia-based international organizations in the 1980s to early 2000s. CBDM gradually evolved into community-based disaster risk management (CBDRM), and then to community-based disaster risk reduction (CBDRR). CBDRM and CBDRR, however, are often used as synonyms (DIPECHO, 2010; Salajegheh & Pirmoradi, 2013; Shaw, 2012; Van Niekerk & Coetzee, 2012).

CBDRM can be defined as inclusive, active and owned community driven processes aimed at addressing the drivers of disaster risk creation; disaster risk reduction; and societal resilience building within the context of local and indigenous knowledge and wisdom. CBDRM thus

implies the direct and continued involvement of at-risk communities in the decision-making process of disaster risk reduction. It assumes that local and indigenous knowledge are akin to scientific knowledge and should be respected. The community becomes the drivers and custodians of knowledge creation, and work in unison with “outsiders” (i.e., International Non-governmental Organizations (INGOs), Non-governmental Organizations (NGOs), governments, and the private sector). Central to CBDRM is the notion that locally relevant solutions must be found and that these solutions are part of the sustainable community development process, implemented through a grassroots approach (Ekanayake, 1990).

20.4 Elements of CBDRM

The relevance of CBDRM is increasing due to the occurrence of disasters and hazards (Krummacher, 2014; UNDP, United Nations Development Programme, 2016). In the event of a disaster, local communities remain the first line of defense or the first responders to an incident. Research has shown (Krummacher, 2014; Shaw, 2012) that a top-down disaster risk reduction program often fails to address the needs of vulnerable and at-risk communities. Communities understand their own contexts and realities the best. Therefore, community involvement is a crucial element for the CBDRM approach. One of the key elements central to community involvement is the sustainability of community initiatives. A CBDRM approach assists in improving the likelihood of sustainability by capacitating at-risk communities through ownership in identifying and addressing their risks and vulnerabilities.

To measure the success of the CBDRM process in capacity development and to achieve sustainability in community initiatives, the UNDP (United Nations Development Programme, 2016) proposes certain elements, which will greatly benefit the CBDRM implementation process. These elements are:

- The existence of a local Disaster Risk Management Committee (DRMC) or organization;
- Community hazard, vulnerability and capacity/resources mapping;
- A community Disaster Risk Management Plan;
- Training in disaster risk management and community learning system(s);
- Regular community simulations and exercises;
- Early warning system(s); and
- A disaster risk reduction fund.

Although all of the above is not a prerequisite for CBDRM, they all go a long way in addressing issues of disaster risk in the CBDRM process.

20.4.1 The CBDRM Process

Abarquez and Murshed (2004, p. 20) state that the CBDRM process “*should lead to progressive improvements in public safety and community disaster resilience*”. They further believe that CBDRM should contribute to effective and equitable sustainable community development. Before engaging in the CBDRM process, a clear differentiation of the different stakeholders engaged in the process should be established. Although there are multiple stakeholders partaking in the CBDRM process, they are mainly divided into two categories (insiders and outsiders) (Abarquez & Murshed, 2004; Kafle & Murshed, 2006). The insiders refer to the communities and the DRMC at a local community level. The outsiders include various governments and their departments, NGOs, INGOs, and private sector role-players, amongst many other. The relationship between the actors is crucial for the effective implementation of the process in reaching the outcomes and the purpose of CBDRM.

The CBDRM process consists of seven (Abarquez & Murshed, 2004) or six (Kafle & Murshed, 2006; UNDP, United Nations Development Programme, 2016) stages. This chapter

will discuss the seven-stage process to provide a more comprehensive overview. The steps in the seven-stage CBDRM process are sequential (Abarquez & Murshed, 2004; Kafle & Murshed, 2006; UNDP, United Nations Development Programme, 2016).

20.4.1.1 Stage 1: Selecting the Community

The first stage in the CBDRM process aims to identify and select the vulnerable communities. To do so, a set of a selection of criteria is proposed: the severity of the vulnerability of the community; the readiness of the community to engage in the DRM process; the availability and accessibility of the community; the number of people to benefit from the DRM process; governments’ priority of socio-economic and physical vulnerabilities; the availability of resources; and a disaster risk reduction budget. These criteria will differ for each given community. Researchers can make decisions based on this given criteria, and through the use of a survey select the most suitable community for participating in the CBDRM process.

20.4.1.2 Stage 2: Rapport Building and the Understanding of the Community

Once the community is selected, the second stage will be to build a relationship with the selected community and to establish trust. A relationship build on trust will encourage the community to share their issues, concerns, challenges, ideas and solutions. To understand the selected community, a rapport should be built with the community – this is an essential component of the CBDRM process. Understanding a community’s development and context include the following basic elements: the spatial characteristics (location of houses, facilities and resources like hospitals, community halls and fire stations); the vulnerability of households and their livelihoods; social groups (including race, gender, class, language and ethnicity); cultural arrangements like hierarchies; and economic activities influencing the community’s livelihoods. Various actions can be performed to build trust with

the selected community. These actions can include: living amongst community members and participating in the daily tasks of the community; be a good listener that is open to change; and to learn from the local community. In performing these actions, the researcher should also keep in mind that one should always show humility, respect, patience, interest, confidence and to not be judgmental. These behavioral characteristics will ensure and establish trustworthy relationships with the selected community, which is key to the success of the CBDRM process.

20.4.1.3 Stage 3: Participatory Disaster Risk Assessment (PDRA)

PDRA is the third stage in which hazards and risks in the selected community are identified and possible measures to overcome those risks are proposed. All stakeholders, including the selected community, are actively participating in this stage of the CBDRM process to collect and analyze disaster risk information. This stage will enable the community and local authorities to plan and be better prepared for adverse events likely to impact the vulnerable community. PDRA forms the basis of the planning stage (Stage 4). The PDRA stage therefore involves the conducting of hazard, vulnerability and capacity assessments. Due to the specialized skills required, knowledgeable individuals will mainly conduct these assessments, however the involvement and active participation of the local community is key to the success of this stage. The PDRA involves a seven-step process similar to a disaster risk assessment process. These steps include: the description of hazards and risks; hazard mapping; vulnerability assessment; risk assessment; prioritization of risks; determining risk levels; and decide on strategies/scenarios for further action. PDRA is thus founded on the belief that local communities can and will help themselves and each other in the reduction and

prevention of risks to build their resilience and ensure sustainability.

20.4.1.4 Stage 4: Community-Based Participatory Disaster Risk Management Planning

Abarquez and Murshed (2004, p. 60) state, “*planning begins with the desire to change existing undesirable conditions. Disaster risk management action planning starts with an aspiration for safety for the self, the family and the community*”. Both government (in the form of local authorities) and the selected community are involved in this stage, actively identifying risk reduction measures to enhance the communities’ capabilities and resilience and reduce their vulnerabilities. Based on the PDRA, the local authorities and the community will be involved in translating the risk reduction measures into a disaster risk management plan. The plan will include risk reduction and transfer measures, mitigation measures, resource requirements, targets that should be reached, technical assistance and building communities’ capabilities.

20.4.1.5 Stage 5: Building and Training a DRMC

In the first stage of the CBDRM process, researchers will learn if viable community organizations already exist within the community. If found that no community organization exists, stage five is an important step in the CBDRM process - to identify, establish and train a DRMC - one of the key elements mentioned above. Abarquez and Murshed (2004, p. 66) describe that the objective of the DRMC is to enable communities to be better prepared for hazardous events and improving community resilience. The establishing and training of a DRMC will thus assist in the implementation of activities as per the disaster risk management plan, and ensure that the objective of the CBDRM approach is reached.

20.4.1.6 Stage 6: Community-Managed Implementation

The sixth stage of the CBDRM process involves the implementation of the disaster risk management plan that was developed in the fourth stage of the CBDRM process. This stage is driven by the DRMC with the assistance of the local authorities. The DRMC will thus be responsible for the overall management of disaster risk reduction activities, while local authorities take the role of a facilitator, assisting the DRMC in the implementation of the disaster risk management plan. Some disaster risk tasks require technical skills and knowledge which might not be present in communities, and thus necessitates the involvement of the local authority.

20.4.1.7 Stage 7: Monitoring and Evaluation

Monitoring and evaluation is the final and challenging stage in the CBDRM (Abarquez & Murshed, 2004). Peoples' assumptions on the progress of the implementation of the disaster risk management plan must be examined and conflicts may emerge. For this reason, the stakeholders in this stage should all actively participate in the process, be open to learning from others, learn to negotiate to address the needs of all stakeholders, and be flexible to changing circumstances. This stage will assess the progress of activities, the way in which it has been conducted (monitoring), and how well these activities have reached the objectives of the disaster risk management plan (evaluation). For successful participatory monitoring and evaluation, harmony amongst all participating stakeholders is needed (Kafle & Murshed, 2006).

become increasingly open to social constructionist perspectives (Tierney, 2007). As a result, there has been a shift from the traditional extractive research (Mercer et al., 2008) to an emancipatory research paradigm characterized by community involvement and participation (Pelling, 2007). There is thus a move away from 'top-down' approaches to 'bottom-up' planning through community engagement (Van Niekerk & Annandale, 2013). Such an approach is driven by the realization that top-down approaches ignore local perceptions, needs, and the potential value of local resources and capacities (Zubir & Amirrol, 2011). As a result, a number of approaches under the umbrella of CBDRM have been introduced to build peoples' coping capacity with disaster risks and reducing their vulnerability, thereby developing safer and more resilient communities (Salajegheh & Pirmoradi, 2013).

CBDRM falls within a broad band of participatory techniques, which are in themselves a bundle of research techniques placing emphasis on participants producing detailed accounts using their own words, knowledge and frameworks of understanding (Chambers, 1994a; Pain & Francis, 2003). Participatory techniques are interactive and collaborative, providing meaningful research experience that promotes both learning and generates research data through a process of guided discovery (Mercer et al., 2008). In particular, action research is a robust and versatile research strategy that is used to understand complex community structures and interaction, determine various types of vulnerability, assist in community capacity building and skills transfer, ensure community participation, and allow for the strengthening of livelihoods (Van Niekerk & Van Niekerk, 2012).

20.5 Research Approaches to CBDRM

Classical disaster research treats disasters as events that originate in earth and atmospheric systems (Mercer, Kelman, Lloyd, & Suchet-Pearson, 2008; Tierney, 2007), thus undermining the influence of social constructs of disasters. However, since the 1940s, disaster research has

20.5.1 Participatory Research

Participatory research methods are geared towards planning and conducting research with those people whose life-world and meaningful actions are under study (Bergold & Thomas, 2012). It focuses on a process of reflection and

action, carried out with, and by, local people rather than for them (Cornwall & Jewkes, 1995). Actually, participatory approaches did not originate as a methodology for research, but as a process by which communities can work towards change (Pain & Francis, 2003). The defining characteristic of participatory research is not so much the methods and techniques employed, but rather the degree of engagement of participants within and beyond the research encounter (Pain & Francis, 2003). In participatory research, all participants are involved as knowing subjects who bring their perspectives into the knowledge-production process (Bergold & Thomas, 2012). Participatory research covers a wide range of approaches and applications and this chapter only illuminates the three main approaches, namely participatory action research (PAR), rapid rural appraisal (RRA) and participatory rural appraisal (PRA).

20.5.1.1 Participatory Action Research (PAR)

Participatory action research (PAR) originates from two research approaches, namely action research and participatory research (Khanlou & Peter, 2005; Van Niekerk & Van Niekerk, 2012). In simple terms, PAR is a way of bringing participation into action research (Khanlou & Peter, 2005). The concept was introduced by Kurt Lewin (1948) as bridging theory and practice, incorporating planning, action and investigating the results of actions. PAR refers to research that engages people usually regarded as ‘subjects’ of research in aspects of research design and/or process (participatory), with an explicit intention of generating practical changes (Banks et al., 2013). According to Gershon, Rubin, Qureshi, Canton, and Matzner (2008), PAR recognizes that there are many ways in which knowledge can be obtained and a strong emphasis is placed on the experiences of community members (Van Niekerk & Van Niekerk, 2012). PAR can involve either quantitative, qualitative, or combined data gathering methods, depending on the issue under investigation (Khanlou & Peter, 2005). PAR is an empowering process that emphasizes collaboration and co-learning among workers and

researchers, therefore it promotes knowledge generation and improvements in organizational and occupational settings (Gershon et al., 2008).

The success or failure of an action research venture often depends on what happens at the beginning of the inquiry process: in the way access is established, and on how participants and co-researchers are engaged early on (Wicks & Reason, 2009). PAR is marked by tension surrounding the simultaneous realization of the aims of participant involvement, social improvement, and knowledge production (Pain & Francis, 2003). Despite its limited use in disaster research, participatory action research (PAR) methodology is considered by Gershon et al. (2008) as an effective tool in identifying and implementing risk reduction strategies and interventions. According to Zubir and Amirrol (2011), working in partnership with at-risk communities, builds local capacity and coping mechanisms to reduce disaster risks and respond to disasters if they occur. As these community-based activities are deeply rooted in the society and culture of an area, they enable people to express their world-views, real needs and priorities, allowing problems to be defined correctly, and responsive measures to be designed and implemented.

20.5.1.2 Rapid Rural Appraisal (RRA)

Rapid Rural Appraisal (RRA) began as a coalescence of methods devised and used to be faster and better for practical purposes than large questionnaire surveys or in-depth social anthropology (Chambers, 1994a). RRA is part of the group of research approaches that involve people merely as informants (Cornwall & Jewkes, 1995). In RRA, information is elicited and extracted by outsiders as part of a process of their data gathering (Ghorbani, Khodamoradi, & Bozorgmanesh, 2011). The approach emerged in the 1970s as a cost-effective way for outsiders to learn about problems faced by communities (Ghorbani et al., 2011). The basic idea in this approach is to quickly collect, analyze and evaluate information on rural conditions and local knowledge. According to Cernea (1999), the main reason for the emergence of RRA was

to find short-cuts in the search for relevant information on rural development issue in order to avoid costly and time consuming research procedures.

Its methods include semi-structured interviews, transect walks with observation, and mapping and diagramming - all these done by outside professionals (Chambers, 1994b; Ghorbani et al., 2011). The rapid rural appraisal is guided by key principles of optimizing data collection using the community as part of the data collection process. The strength of this approach is that it emphasizes learning as being from, and with, the local people to build on prior knowledge. Learning is conducted directly within the community, benefiting from indigenous technical and social knowledge and skills. The local community is taken to be the custodian of the wisdom required and has the capacity to uplift their standard of living (UNISDR, 2005). The demise of the approach was that information is gathered from the community and the analysis is done elsewhere by experts (Ghorbani et al., 2011) and as a result, in the late 1980s and early 1990s, the practice of RRA evolved to participatory rural appraisal (PRA) (Chambers, 1994a).

20.5.1.3 Participatory Rural Appraisal (PRA)

Chambers (2015) describe PRA as a growing family of approaches, methods, attitudes and behaviors to enable and empower people to share, analyze and enhance their knowledge of life conditions and to plan, act, monitor, evaluate and reflect. The approach recognizes the expertise of the non-experts, that the local people are more knowledgeable about their environment than the external experts (Chambers, 1997). As such, outside institutions and researchers play the role of facilitators and coordinators of development programs (Abarquez & Murshed, 2004).

PRA methodology often involves participatory diagramming with other techniques such as interviewing and observation (Pain & Francis, 2003). The PRA methods, are extensively practiced in development activities, and particularly for disaster research, are often used for carrying

out the vulnerabilities and capacities analysis (VCA) (Vatsa, 2004). Developed in the context of relief work undertaken by NGOs, VCA is an assessment by dividing societal capacities and vulnerabilities into three categories: physical/material; social/organizational; and motivational/attitudinal (Vatsa, 2004). In addressing local disaster risks and events, PRAs can empower people with the knowledge and skills they require to sustain themselves, using local resources (Phiri, 2014). However, the PRA approach suffers from a few flaws, even with the underpinning assumption that solutions to all problems can be found exclusively within an ordinary community (Cronin et al., 2004). For instance, purely bottom-up planning is not always feasible, especially in the development of emergency plans where coordination of activities between communities and other agencies/administrators is needed (Cronin et al., 2004). Moreover, the typical orientation of PRA is to place more value on local knowledge than on outside or “western” knowledge (Chambers, 1994a), and sometimes this may result in neglect or disparagement of non-local knowledge (Kapoor, 2002), and a loss of opportunity for education (Von Kotze, 1998).

20.5.2 Community-Based Disaster Risk Assessment and Action

Community-Based Disaster Risk Assessment is a diagnostic process to identify the risks that the community faces and how people overcome those risks (Abarquez & Murshed, 2004). It should however be noted that risk assessment is not simply a matter of collecting data about meteorological patterns, but rather identifying hazards and understanding how danger is constructed at the local level, and who is most exposed (Enarson et al., 2003). The people most directly affected can identify problems and suggest solutions, and are the best advocates for changes that make life safer. A thorough assessment of the community’s hazard exposure

and analysis of their vulnerabilities as well as capacities should be the basis for activities, projects and programs to reduce disaster risks (Abarquez & Murshed, 2004). Vulnerability mapping' in the DRR includes the listing, frame-working and analysis of vulnerabilities of different categories of people under different circumstances (McCall, 2008). This kind of risk assessment is a vital tool for learning what makes daily life risky and how people's lives can be made safer (Enarson et al., 2003).

Community-based vulnerability assessments start with community organizing and depend on people's local knowledge (Enarson et al., 2003). The community should be involved in the process of assessment, planning and implementation. This approach will guarantee that the community's real needs and resources are considered. In this regard, there is more likelihood that problems will be addressed with appropriate interventions (Abarquez & Murshed, 2004). Community-Based Disaster Risk Assessment approaches claim to use qualitative methods to produce data that are owned by the subjects of the research, and that the research process contributes to local empowerment (Pelling, 2007). Most importantly, community-based disaster risk management research approaches yield the best results and most trustworthy primary data in understanding the disaster risk that communities face (Van Niekerk & Annandale, 2013). This is so because CBDRA puts communities at-risk at the heart of the entire disaster risk management research process (Abarquez & Murshed, 2004).

Community-based methods have been successfully applied to assess the impact of individual projects or for local-level assessments of vulnerability or capacity (Pelling, 2007). For Chambers (1987), the essence of participatory approaches is to understand and give voice to local conceptions of reality through local people's own analysis of challenges and capacities. Some of the activities under this approach include participatory GIS (Kienberger, 2005) or participatory mapping towards hazard identification and risk mapping. The values of seeking

local knowledge include mapping direct experiences and historical 'folk memories' of hazards, exposure and vulnerabilities various kinds (McCall, 2008). It must however be noted that each local assessment has its own uniquely derived conceptual framework, making comparison and aggregation across locations extremely difficult.

20.5.3 CBDRM Research in Practice

The diversity of participatory approaches is growing and the list discussed above is not exhaustive. In practice, it is difficult if not impossible to stick to one rigid approach in conducting CBDRM research and therefore flexibility and adaptability in response to changing contexts are often essential. CBDRM approaches have been used by NGOs and academia as a common approach to build resilient communities in their DRR efforts (Shaw, 2013). The approach has been initially implemented in the developing world by local NGOs followed by international organizations. The approach is now increasingly promoted among communities and local authorities to strengthen the links between the official disaster risk management systems and community-based organizations (Shaw, 2013). Since there are many organizations currently implementing CBDRM in various developing countries with the practice gaining momentum and becoming widespread, there are many case studies of DRM research projects with community-based approaches by academia, NGOs and local governments. A few of these will be highlighted in the next section.

20.6 Regional Evidence of CBDRM

Although the process of CBDRM has been widely used, its implementation varies across regions. A selection of examples has been identified from Asia, Latin America and the Caribbean, Australasia, North America and Africa.

20.6.1 Asia

Asia faces threats from diverse and frequent incidents of hazards in the region. The risk posed by hydrometeorological and geological hazards, have the ability to undermine the fragile development progress of many countries. Limited resources, constant threats, and diverse terrain complicate efforts to reduce risk. As a result, CBDRM has become a much-used tool for helping at-risk communities. Information dissemination and capacity building has been a common element of CBDRM in Asia. NGOs have been significant contributors to CBDRM activities through their work in facilitating capacity building and skills development (livelihood related).

Oxfam Great Britain partnered with the Doaba and Help Foundations within **Pakistan's** Punjab province (Oxfam Great Britain, 2012) to lead interventions directed towards assisting community members to deal with the implications of living in highly flood-prone areas. The CBDRM programs have focused on increasing local capacity, improving livelihood resilience and enabling resource provision (Oxfam Great Britain, 2012). The program worked with community members to craft a village level disaster risk management plan as well as for providing training in the areas of first aid and search and rescue practices. Capacity building in this project extended beyond traditional awareness and preparedness practices to include strategic agricultural practices and animal husbandry. This approach acknowledges and validates the important links between vulnerability and livelihood security. Additionally, residents were provided with livelihood related resources (such as goats for livestock rearing) and hand pumps for accessing ground water (Oxfam Great Britain, 2012).

Community Based Action Teams (CBATs) were created with local community members within targeted villages in **Indonesia** (Kafle, 2010). These teams led awareness dissemination activities among the wider population as a prevention activity as well as coordinating community response and communicating threats within

the locality. The **Nepalese** have taken a unique approach for involving community members in their CBDRM initiatives. Street performers were engaged as primary communicators for sharing disaster risk-related messages to communities (Gautam, 2009). The two factors which contributed to the use of the street drama technique, included the recognition that the population was primarily comprised of a diverse group of immigrants and the fact that traditionally men have taken on the primary role in community discussions. The idea of street performance was determined to be a tool that could reach the most vulnerable and often overlooked groups in the community context such as women, youth and minorities. The participants were invited to attend disaster risk management trainings within the communities and were taught how to write scripts and act in locally relevant plays. "It has had increased awareness among the audience but also provided performers with skills to implement risk reduction" (Gautam, 2009). The dramatic presentations have been instrumental in inspiring local members of the community to create rules and regulations regarding the protection of river banks. They have initiated plans directed at eliminating grazing in specific areas and have taken a proactive approach to self-funding small scale initiatives rather than waiting for government handouts in times of adversity (Gautam, 2009).

In Divinubo (**Philippines**), CBDRM examined the use of participatory 3-dimensional modeling initiated through workshops and focus groups (Maceda, Gaillard, Stasiak, Le Masson, & Le Berre, 2009). This approach involved local community residents engaging in disaster risk reduction workshops and collaborating to create a physical multi-dimensional model to highlight the hazard threats, vulnerable areas, and potential resources (Maceda et al., 2009).

Support for CBDRM is a defining factor in shaping the success of initiatives. Its value is based on its inherent and undeniable links to development and planning. This is the case in **Cambodia** where "the government considers CBDRM as an integral part of its rural

development program to alleviate poverty” (United Nations Economic and Social Commission for Asia and Pacific, 2008).

The **Japanese** have the practice of *Jishu-bo-sai-soshiki* (or *Jishubo*), which is recognized as an autonomous organization for disaster reduction and as a neighborhood association for disaster preparation and rescue activities (Bajek, Matsuda, & Okada, 2007). The *Jishubo* serves as a voluntary organization, and local governments encourage involvement in disaster risk management programs at the community level (Bajek, Matsuda, & Okada, 2007).

In some instances, CBDRM is regarded as primarily a community initiative with greater support from NGOs than local government. In Palang Merah **Indonesia** (PMI), the Canadian Red Cross (CRC) aimed to integrate disaster risk reduction at the community level as well as prioritize its inclusion into development planning, preparedness, response, recovery and prevention activities (Kafle, 2010). The program targeted 43 villages within Aceh Jaya, Aceh Besar and Nias in response to the devastation of the December 2004 tsunami (Kafle, 2010). In the Philippines, NGOs involved in CBDRM have worked extensively in advocacy and lobbying for policy reforms at the national and local levels (Asian Disaster Preparedness Centre, 2008).

20.6.2 Latin America and the Caribbean

Latin America and the Caribbean are regions that experience an annual onslaught of threats from hurricanes, tropical storms and floods as well as geological hazards such as earthquakes and mass land movements. The diversity of the region presents opportunities and challenges for implementing CBDRM projects.

As a small country in Central America, **Belize** is located below sea level and as such is particularly prone to coastal flooding (The Pan American Development Foundation, 2015). It is also vulnerable to the effects of climate change and acknowledge the growing threat of sea level rise to the population. The Pan American

Development Foundation has sought to establish a CBDRM project in Dangriga and Hopkins to assist communities in building resilience through capacity building and training activities, developing early warning systems (for flooding) and implementing climate adaptation strategies (The Pan American Development Foundation, 2015).

In Jeffrey Town on the island state of **Jamaica**, local farmers’ associations have been active in the process of identifying procedures and strategies to be employed at community level in response to, recovery and preparing for a number of hazards (United Nations Development Programme, 2015). The Jeffrey Town Farmers’ Association worked with the broader community and in collaboration with both the St. Mary Parish Disaster Committee and Parish Emergency Operations Centre to create a community-based disaster plan for directing local level response to hazard threats (United Nations Development Programme, 2015).

Youth have been identified as the lead group in CBDRM activities in the sub-watershed region of the Acahuapa River in **El Salvador**. Young people served as the focal point for capacity building activities but more importantly, they were supported in efforts to develop community risk maps and subsequent community level mitigation projects (United States Agency for International Development, 2011).

20.6.3 Australasia

Extensive CBDRM activities have been conducted across the Pacific islands over the past decade. A number of projects have taken place on the island of **Samoa** (Gero, Méheux, & Dominey-Howes, 2011). They involved various partner and funding agencies including the Red Cross, the United Nations Development Programme and local faith-based organizations. The majority of these projects have targeted education and community awareness activities relating to the diverse needs of at-risk communities. Another project in Samoa, involved developing a village level response plan booklet for households based on the education and community

awareness. A CBDRM project also extended beyond traditional hazard awareness to include understanding of food security, nutrition and sustainable livelihoods. This diversity in focus was seen as a means of remedying continuous dependency of local residents on remittances in times of crisis (Gero, Méheux, & Dominey-Howes, 2011).

Projects in Navua, **Fiji** involved local level risk management approaches with a focus on capacity building activities especially including community members as well as local authorities and relevant NGOs (Gero, Méheux, & Dominey-Howes, 2011). A broader scale program worked with key members of the Catholic community with Fiji, Samoa, Kiribati and Vanuatu to create skilled religious local leaders, capable of communicating critical information to residents (Gero, Méheux, & Dominey-Howes, 2011).

CBDRM was used in **Papua New Guinea** as a tool for accessing and integrating isolated settlements in efforts to understand risk. The project aimed to identify how indigenous and western knowledge utilized within indigenous communities could be integrated to reduce their vulnerability to environment hazards (Mercer et al., 2008). It worked towards creating a forum where marginalized traditional knowledge could be recognized and validated within community focused risk reduction plans.

20.6.4 North America

CBDRM has been documented in the Red River Floods in Canada and the United States in 1997 (O'Neill, McLean, Kalis, & Shultz, 2016). Research in Winnipeg **Canada** examined CBDRM from the viewpoint of community development and social capital (community bonds) (Buckland & Rahman, 1999). The findings showed that the communities with the strongest community-oriented patterns of development, such as the Rosenort (a predominantly Mennonite community) and St. Jean Baptiste (predominantly Francophone) areas responded

more effectively to the flood (Buckland & Rahman, 1999).

In 2005, the **United States** became famous for its failures in the government's management and response to Hurricane Katrina. Despite the debate over national responsibility for disaster preparedness and relief efforts, a number of community-based organizations took the lead in directing community disaster response efforts. Many pre-existing community, faith-based and non-profit organizations utilized their organizations' skills in areas such as care giving, social support and general care (Patterson, Weil, & Patel, 2010). An example of the contributions of community organizations were the activities directed at communicating hazard threats to the socially isolated immigrant (Vietnamese) families and their collaboration to support their evacuation from the affected areas (Patterson, Weil, & Patel, 2010). Following the onset of the hurricane and the collapse of the levees, similar groups helped to support the return of evacuated families and worked together to support efforts to rebuild and repair their homes and communities.

20.6.5 Africa

Africa as a continent, has struggled for decades with development-related challenges and high rates of extreme poverty. The ongoing complexity of risk faced in this region is compounded by the spread of HIV/AIDS and its effects on already vulnerable populations (Holloway et al., 2015). Governments, NGOs and aid agencies have recognized the need for seeking to reduce disaster-related risk in the region.

The Buzi District of Sofala Province (**Mozambique**) went beyond awareness and capacity building activities and included disaster simulation exercises as means of preparing community members for the risks of area flooding (Hellmuth, Moorhead, Thomson, & William, 2007). Oxfam Great Britain worked in **Niger** to train 3000 people including 943 women in disaster risk management in response to drought and water scarcity related risk (Global Facility for

Disaster Reduction and Recovery, 2014). The training was part of a larger project to help develop local coping strategies for working with locally pertinent hazards.

The Girls in Risk Reduction Leadership (GIRRL) project method has been recognized as a powerful approach for promoting adolescent girl driven CBDRM in **Southern Africa** (United Nations International Strategy for Disaster Reduction, 2008). Originally designed as a small pilot project the approach has been scaled up and implemented across **South Africa, Lesotho** (Mphaki), **Malawi** (Gwazanyoni/Kalulu/Maliseru/Mazanani and Chidawa/Losiyati/Malinda/Moya/Mtandaza), **Zimbabwe** (Tshidhixwa), and **Zambia** (Kanyama settlement, Lusaka) (Genade & Van Niekerk, 2014). It used a Participatory Action Research approach to focus on understanding the needs of the vulnerable groups (specifically adolescent girls) in disadvantaged communities (Forbes-Biggs & Maartens, 2012; Forbes-Genade and Van Niekerk, in press). The girl participants drove the direction of the intervention based on their perceptions of individual and community risk. The approach aimed to develop capacity in otherwise marginalized groups and then promoted these groups as leaders and role models for reducing risk in the community. Stakeholders and participants identified the critical issues that contributed to their risks within the local context (Forbes-Genade and Van Niekerk, in press). Capacity building sessions varied across sites based on needs. However, common sessions included: mental, physical and sexual health, personal safety, fire safety, positive thinking and career guidance, peer education, family planning, community involvement, climate change, disaster risk management, environmental awareness, first aid training, community disaster risk assessments, effective communication, and community event planning (Forbes-Biggs & Maartens, 2012). In 2011, CARE Southern Africa Region partnered with the African Centre for Disaster Studies at North-West University (South Africa) to use the GIRRL Project model of female empowerment for CBDRM in the

Integrating Adolescent Girls in Community Based Disaster Risk Reduction in Southern Africa Project (IAG) (United Nations International Strategy for Disaster Reduction, 2015). The IAG Project was adapted to the unique parameters of each pre-identified hazard and the dynamics of each community.

The GIRRL Model in the IAG Project has gone on to involve girls in local disaster committees (**Zambia, Lesotho, Malawi**), conducting community risk maps (**South Africa, Zambia**), as partner with boys in sharing risk reduction knowledge (**Zambia**), collecting water samples for testing (**Zambia**), hosting and developing community awareness events (**Zimbabwe, South Africa, Malawi**), being trained in first-aid (**Zimbabwe, Zambia, South Africa, Lesotho, Malawi**) and fire safety (**South Africa, Zimbabwe**) (Genade and Van Niekerk, in press; United Nations International Strategy for Disaster Reduction, 2015). In 2016, the GIRRL Model was again rolled out in four Southern Africa countries (**Namibia, Botswana, Swaziland and Mozambique**) under the USAID funded “Engaging African GIRRLS in Gender Enriched Disaster Risk Reduction (EAGER)” project.

20.6.6 Europe

There are very few examples of CBDRM in Europe despite the fact that the region is a main contributor to international projects and programs with that focus. It begs the question of the prevalence of externally driven projects, such as those funded by European or North American agencies and the potential implications or benefits. Does this contribute to less accountability for the state and greater dependency on external support or does it fill a critical gap? While not exclusively the case, it is a common occurrence as presented in the aforementioned examples. External assistance, while seeking to provide help and support greater self-sufficiency at community level, may unintentionally undermine the autonomy of nations to affect their own disaster risk reduction strategies (Ullberg & Warner, 2016).

20.7 Gender as an Integral Element to CBDRM

Gender has been receiving more promotion and recognition within disaster risk management activities, in line with the sentiment of the Sendai Framework for Disaster Risk Reduction (United Nations Office for Disaster Risk Reduction, 2015). Effective CBDRM must take gender into consideration. However, many of the projects mentioned above, appeared to approach communities as homogenous groups. Others included gender as a ‘box’ to tick off rather than as integral element in planning and implementation. The ‘boxes’ usually reflected the gender disaggregation of participants as opposed to the degree of active engagement and gendered participation in the project. Gender serves as a primary element in defining human identity and shaping the lived experienced of persons in a particular community or context. As a result, it influences the factors such as access to resources, ability to protect oneself and to respond to adversity (Ikeda, 1995; Laska, Morrow, Willinger, & Mook, 2008; Richter & Flowers, 2010).

The empowerment of women is a critical ingredient in building disaster resilience (UN, 2015), and in ensuring successful and representative CBDRM (United Nations International Strategy for Disaster Reduction, 2008). Whereas, women’s vulnerability to disasters is often highlighted, their role in fostering a culture of resilience and their active contribution to building disaster resilience has often been overlooked and has not been adequately recognized (UNISDR, United Nations International Strategy for Disaster Reduction (UNISDR) 2009). This despite the fact that the capacity and knowledge that women and girls have, play an important role in individual as well as community resilience (UN, 2015). With women and children most vulnerable to disasters, a gendered approach to examining their conditions and aspects of vulnerability, capacity and coping is important in CBDRM. A gender-conscious approach to disaster risk reduction is based on the premise that disasters affect men and women and boys and girls differently because of their position in

family and society. According to Delica-Wilson (2005), gender- and culture-sensitive CBDRM recognizes that men and women have different needs, different activities, different perceptions of risk and different priorities. Due to existing socio-economic conditions, cultural beliefs and traditional practices, women are more likely to be disproportionately affected by disasters (UN, 2015; Neumayer & Plümper, 2007). Enarson, Fothergill, and Peek (2007) posits that understanding differences among women based on race and ethnicity caste and class, nationality and culture, sexuality, religion, life stage and physicality is vital in disaster risk management. Thus, she calls specifically for more direct attention to gender and race/ethnicity and more broadly to gender and cultural differences (see Enarson, 2012, 2009, 1998; Enarson et al., 2003; also see the chapters on Gender and Disasters by Enarson et al., and Children and Disasters by Peek et al. in this book).

20.8 Commonalities, Differences and Constraints in CBDRM Approaches

The CBDRM project and programs presented above shows the achievements of communities across the world. Despite the diversity of hazard threats or vulnerabilities, each project sought to approach disaster risk management from the local level in order to help protect those persons directly affected by the adverse effects of disasters. Activities varied from street performances in Nepal, 3-D modeling in the Philippines, risk mapping in Jamaica, South Africa, Zambia and El Salvador and sharing evacuation notifications in America. Disaster response activities helped communities by improving capacity in terms of search and rescue in Pakistan and first aid provision in the GIRRL/IAG Projects sites of Southern Africa.

A critical point of deviance was the leadership of the projects or program. Many of the projects were driven and funded by external NGOs and introduced to communities and only a handful were instigated by the government (similar

findings were reported by Van Niekerk & Coetzee, (2012). What was even more significant was the fact that so few were promoted as being initiated by the communities themselves and supported by other role players. There could be a number of reasons for this; however, it is worthy of mention since they take on the role as an organization's project rather than having the community's true face.

CBDRM needs to take into the account the diversity of the community and acknowledge the wealth of knowledge that each member can provide in terms of past disasters, and identifying key vulnerability and capacities among all residents. By regarding communities as key partners in risk management, governments and NGOs can help target limited resources, define gaps and build on the strengths of each community to help build greater resilience.

Shaw (2012) as well as Van Niekerk and Coetzee (2012), further identified a number of current constraints in the implementation of CBDRM. Although the theory of CBDRM and methods (see Sect. 20.4 above) is fairly well established, practice still lags behind theory. It is common cause for practitioners to equate normal development activities to CBDRM without making a noticeable distinction. Most CBDRM approaches still follows a "top-down" approach, where implementation is driven by NGOs, INGOs and government - not communities. The involvement of these communities is thus assumed, but concealed. The lack of governance structures, institutions and policy frameworks can largely be blamed for the shifting of responsibilities to the NGO/INGO sector. Although this ironically assists in bringing CBDRM closer to communities it leads to absconding of coordination, responsibilities, empowerment and financing on the side of governments.

20.9 Conclusion

CBDRM not only assists in the creation of a better understanding of the dynamics of disaster risks, but also allows space for solving intricate

problems and building societal resilience. In defining community beyond space and time allows for a deeper understanding of the disaster risk creation process. However, CBDRM is not a spontaneous process and requires thorough planning, capacity development, understanding and ownership. CBDRM must be seen as a complementary research tool which allows practitioners and academics alike to better understand complex issues such as disaster risks. As with many other research methods, CBDRM lends its relevance from the development sector and should thus be treated within the same space. Communities do not readily define their problems in terms of disasters, but rather development problems. In this context, CBDRM provides ideal ground for the integration of disaster risk management and development issues. However, one needs to be cautious in over reliance on deep technical understanding of natural hazards or vulnerabilities from communities. Research has shown that external facilitation is sometime still needed to drive the CBDRM process and knowledge, although locally generated, must be judged with through appropriate filters. It can be argued that CBDRM has been much more successful in the developing than developed world due to the type of development interventions in these countries. Communities form an integral part of the consultation process because in many instances the needed governance structures are non-existent. On the other hand, well off countries have much more resources for disaster risk reduction and mitigation and thus communities can rely on such resources.

Future research on CBDRM needs to solidify a broad, but robust theoretical grounding on the topic. A number of possible research questions from this chapter arises such as: What are the linkages between the theory and practice of CBDRM? Why does CBDRM succeeds in some instances and fail in others? What are the key components which makes CBDRM projects successful and why? What different types of CBDRM can be identified and what are their integration with development activities? Which of these are normally internally or externally led,

and which are more successful – and why? Does CBDRM lead to better disaster response and recovery? Is community ownership the key to successful CBDRM, or external facilitation? How does gender as a distinct element influence CBDRM? How is CBDRM integrated into other disaster risk management processes/projects? Is there evidence that CBDRM leads to a significant reduction of disaster impacts? When is CBDRM interventions most appropriate? Who governs/should govern CBDRM? Is there evidence of CBDRM in non-traditional disaster risk reduction disciplines? What new research approaches to CBDRM has been/can be developed?

Answering some of the questions above will provide a steady foundation from which CBDRM can become an integrated and important aspect of disaster risk management. CBDRM thus has the potential to greatly impact, influence and inform decisions leading to safer and more resilience communities.

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