Empowering Women through Participatory Action Research in Community-Based Disaster Risk Reduction Efforts

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Abstract
The role of women in community-based disaster risk reduction efforts (CBDRR) is an area of limited academic research and continues to be a thorny issue for policy and practice. This research paper describes a comparative case study of participatory action research (PAR) in CBDRR conducted in one rural and one urban tole (neighbourhood) of Kathmandu Valley, Nepal. PAR is not a method, rather it is a set of principles guiding research. The "Empowering Women through CBDRR" PAR was motivated by the National Society for Earthquake Technology-Nepal's (NSET) desire to learn how to effectively empower women in disaster risk management on a local level and to enhance resilience to everyday hazards and risks as well as earthquakes. The hazards identified by residents in rural Bhainse were the supply of drinking water and landslides while the supply of drinking water and earthquakes were the perceived hazards in urban Tajhya Tole. The small-scale mitigation activities chosen and implemented by the female led disaster management committees in partnership with the local authorities and NSET addressed everyday risks (fire) that were important to the community or were related to livelihood concerns (landslide and drainage pipe). While there is clear evidence of women's empowerment and capacity building, sustainability of initiatives is particularly dependent on the commitment of local authorities to incorporate the initiatives into local policies and actions. A gap remains between aspirations to practice empowerment of women and implementation. In many ways, 'doing' empowerment remains problematic in CBDRR.

Keywords: Participatory Action Research, CBDRR, Empowerment, Gender, Nepal,

1. Introduction

Donors, international non-governmental organisations and non-governmental organisations (NGOs) have become an essential component in the evolving disaster risk reduction (DRR) context (Benson, Twigg, & Myers, 2001). This has resulted in a specific DRR governance landscape, in which the broader neoliberal agenda has shaped the political and institutional contexts, as well as shaping power relations among different stakeholder groups (Jones, Oven, & Wisner, 2016). With the presence of various stakeholder groups and interventions of both state and non-state actors, the forms of power – political, economic, cultural – and their interaction with one another have become more complex. This has led to questions of the interplay of power and knowledge, and how such interplay could influence vulnerability and capacity in risk governance (Gaillard, Fordham, & Sanz, 2015; Jones et al., 2014; Ojha et al., 2009). This also leads to further questions of how to bridge knowledge to action at different levels (Gaillard & Mercer, 2012).

The role of women in DRR efforts on a local level has been insufficiently interrogated by academic literature and continues to be a thorny issue for effective policy and practice. Moreno and Shaw (2018) contend that gender mainstreaming in response to disaster is still in its infancy

in disaster literature due to a lack of theoretic analysis of gender and complex power relationships within societies (UN Women, 2016). Furthermore, Ramalho (2019a) has seen slow progress in addressing gendered needs and interests both in scholarly discussion and in practice. How to empower women and the communities they live in remains a challenge[1]. To explore how to do this more effectively, Participatory Action Research (PAR) as an approach was utilised to conduct this research. PAR is not a method, rather it is a set of principles for designing, conducting, analysing and acting on emerging research (Pain et al, 2011). It exists in tension between theory and practice because it attempts to perform both research and action (Brun, 2009).

The words "participatory action research" highlight respectively that the research subjects are full *participatory* partners in the work of trying to solve a problem, *action* required to solve the problem needs to arise from the collaboration, and lastly, *research* is being (co)produced (Kelman et al, 2011). PAR involves different phases including planning, action, reflection, and evaluation (Kindon et al, 2007). The "Empowering Women through Community Based Disaster Risk Reduction" (CBDRR) participatory action research initiative was motivated by the National Society for Earthquake Technology-Nepal's (NSET) desire to learn how to more appropriately and effectively empower women in disaster risk management on a local level and to enhance resilience to everyday hazards and risks as well as earthquakes.

NSET is a non-profit organization working on DRR with a special focus to earthquake risk management since 1994. Bringing national policies and governance effort to the last mile by providing evidence to link science and technology to people in order to reduce vulnerabilities and save lives is the guiding philosophy of NSET. It has been supporting the Government of Nepal at all levels in formulating policies, plans as well as guidelines related to DRR. NSET is currently supporting 50 municipalities in implementing national building code as well as providing technical input to 30 municipalities spread over four districts in the reconstruction of private houses destroyed by 2015 Gorkha Earthquake. NSET has been also assisting in urban regeneration, retrofitting of schools and buildings affected by Gorkha earthquake. It works in the field of capacity building of masons and engineers in earthquake resistant construction. Another major work of NSET has been assisting the municipalities to formulate and implement Local Disaster and Climate Resilient Plan. Through this PAR, NSET wanted to attempt a responsible and ethical research agenda exploring an area where they were lacking sufficient knowledge.

This research paper describes a comparative case study of PAR in CBDRR conducted in one rural and one urban tole (neighbourhood) of Kathmandu Valley, Nepal. It examines how a national organization attempted to learn how to collaborate with and empower women in disaster risk management on a local level. The format of this research paper is as follows: First we present a literature review of gender and disaster, DRR in Nepal after 2015, CBDRR, as well as DRR and everyday risks. Then the methodology utilised is described including a description of the two small communities (one urban - Tajhya and one rural - Bhainse) where the PAR 'Empowering Women through CBDRR' initiative was carried out. The findings are presented regarding the results of the risk perception survey and the implementation of small-scale mitigation interventions. The discussion follows which focuses on evidence of women's empowerment and capacity development, the CBDRR relationships between local authorities and residents. Finally, the sustainability of initiatives is considered.

[1] This paper discusses "women's" empowerment and does not sufficiently address gender issues where power require more analysis.

2. Literature review

2.1 Gender and disaster

Dual themes predominate in disaster literature – women as vulnerable or capable in relation to the environment, with limited research in the interaction between this problematic binary (Moreno & Shaw, 2018). Vulnerability studies often portray women as passive and helpless victims who lack agency (Bradshaw & Fordham, 2014), a portrayal supported by evidence that women are more vulnerable to hazards than men (Dhungel & Ojha, 2012; Drolet et al., 2015; Horton, 2012). However, it is important to note that their vulnerabilities are related to pre-existing social inequalities in terms of restricted access to assets (physical, financial, human, social and natural) and unequal power relations which undermine their capacity to respond (Bradshaw & Fordham, 2014).

Gender and disaster literature emphasize that women are not subordinate or passive recipients of aid but rather are active agents (Gaillard, Fordham, & Sanz, 2015; Moreno & Shaw, 2018). Furthermore, the capacities of women are rarely recognised in policies and practices of DRR, resulting in further marginalisation (Enarson & Chakrabarti, 2007; Bradshaw et al., 2017). This "underrepresentation of women in disaster research and policymaking becomes important when initiatives are developed in the area of service provision" (Rushton et al, 2020; p. 2).

Women are often excluded from disaster risk reduction efforts due to various factors that perpetuate patriarchal systems (Bradshaw, 2013). In Nepal, there is a complex set of intersectional [2] factors such as caste, gender, age, marital status, educational attainment amongst other factors which manifest themselves in social norms that limit women to speak on their own behalf and constrain their access to external agencies offering assistance, high levels of illiteracy, and restricted access to and control over financial resources (Yadav, 2019). These factors have resulted in women in Nepal having minimal opportunities to participate in disaster-based communal activities and decision-making processes (Thapa & Pathranarakul, 2019). While there are many examples of women's informal community involvement in disaster reduction in Nepal, they continue to be excluded from formal planning and decision making (Jha, no date). In parallel to this, women's responsibilities in post-disaster situations have tended to increase since they are responsible for their children, the elderly family members living at home, household belongings and livestock in times of crisis. All of these responsibilities suggest that additional demands on their time is an issue to be considered in research, policy and practice.

2.2 Disaster risk reduction in Nepal after 2015

Nepal is among the 20 most disaster-prone countries in the world. Situated in the middle portion of the Hindu Kush Himalayan region, a high seismic risk zone, it is highly susceptible to earthquakes, ranked 11th in the world in terms of vulnerability to earthquakes (MoHA, 2018). Other natural hazards are also frequent, such as flooding and landslides due to its rugged topography and prevalence of flood-prone rivers, both of which occur annually during the summer monsoon, and the latter of which occurred in the thousands during the major earthquake of 2015 (Kargel et al., 2016) and in subsequent years. Hazards including floods, landslides, windstorms, hailstorms, fires, earthquakes and glacial lake outburst floods pose a risk to 80% of Nepal's population (MoHA, 2018).

[2] For a detailed analysis of intersectionality, please read Crenshaw (1989).

The country has been divided into seven federal provinces after the promulgation of its new constitution through its Constituent Assembly in September 2015 (only five months after the Gorkha Earthquake). Key legislation governing disaster management from 1988, The Natural Disaster Relief/Calamities Act of 1988, has been replaced by the Disaster Risk Reduction and Management Act of 2018. The constitution of Federal Nepal 2016 has provided full authority and responsibility to conceptualise, formulate and develop Disaster Risk Reduction Plans, including implementation to all of the new 753 local authorities in the seven provinces. These municipalities comprise 6 metropolitan cities, 11 sub-metropolitan cities, 273 urban municipalities and 460 rural municipalities. Each of the local governments is further divided into 6-32 small units called wards. There is a total of 6,743 wards throughout Nepal (mofaga.gov.np, 2020). These wards are the lowest unit of local government and are led by a ward chairperson and elected four members. There are marked differences in terms of institutional capacity between urban and rural municipalities as well as municipalities that existed before 2014 (Ruszczyk, 2020). The wards engage with their residents on an informal neighbourhood level called the *tole* which is comprised of 50-100 households.

Most of the newly elected local governments already have prepared a DRR policy (at least on paper) following federal government formal documents and guidelines; they have formed disaster management committees and established a disaster fund in their respective municipalities and wards. Many local authorities lack the technical expertise to implement their DRR plans. Some of the municipalities have also begun to formulate and implement joint Municipal Level Disaster and Climate Resilience Plans. The reality is becoming clearer for the newly elected local authorities regarding their responsibilities and as important, with their newly significantly increased financial resources, local authorities are now empowered to implement projects at a local level. In this new governmental and legal environment post 2017-2018[3], all these factors are creating an opportunity for DRR initiatives to be embedded and mainstreamed at the municipal level throughout the country.

Thapa & Pathranarakul's research on gender inclusiveness in disaster risk governance post Gorkha Earthquake is highly informative. They found that "there is virtually no formal channels for women in the community to participate actively in the disaster risk management planning and programs" (2019, p.213). Regarding the effects of gender relations in society (power and access to control over resources) and whether it creates a barrier for women to participate actively outside their house, they found that 67% of respondents (n=199) either did not know or thought gender relations have no impact on participation in disaster risk management. In Kathmandu valley, Thapa & Pathranarakul found there were no "platforms where women could participate in and contribute to help the community in the post-disaster environment" (Ibid, p.215).

2.3 CBDRR

Globally, a community-based approach to DRR has emerged and become common in the past three decades (Maskrey, 1989; Blaikie et al., 1994). Central to CBDRR is the principle of participation (Shaw, 2012). To make disaster management effective, local communities must be supported and enabled to analyse and evaluate their hazardous conditions, vulnerabilities as well as capacities with the bottom-up approach typified CBDRR (Delica-Willson, 2005; Shaw, 2012). This is shown in growing attention to the role local actors play in DRR and more specifically CBDRR (Davis & Alexander, 2016; Hewitt, 2009; IFRCRCS, 2015; Luna, 2014;

[3] Municipal elections were held in 2017 (the first in two decades) and provincial elections were held in 2018.

Rolsted & Raju, 2019). The ideal scenario is promoting local ownership to development and management projects based on local people's capacities with the contribution of external expertise (Heijmans, 2004). In this case, communities are considered resourceful people where their voices can be heard and their rights to participate acknowledged (Wisner, Gaillard, & Kelman, 2012). CBDRR is also believed to strengthen social cohesion and cooperation within the community and build confidence of individuals, households and groups (Shaw, 2012).

Although CBDRR makes it possible to improve the position of vulnerable people by attempting to address the root cause of their vulnerability and by acknowledging their fundamental right to participate, what tends to be neglected is the power hierarchies and relations that contribute to vulnerability and the existing stereotyped gender roles that may hinder creating spaces for women's empowerment (Ramalho, 2019b). How to build and strengthen those capacities and confidence remains problematic (Rolsted & Raju, 2019). In Nepal, Rolsted and Raju have argued that "there are strong capacities in social capital, in local organisations such as youth groups, mothers' groups and scouts and in the ritual activities that are embedded in a community, but that these capacities are not sufficiently recognised" (2019, p. 4). This is similar to Ruszczyk's findings (2014) of women's groups in the Newari community located in the core area of Lalitpur, Kathmandu Valley and the significant role they play in educating women and their families about everyday issues such as health and more disaster related issues such as how to reduce the impact of earthquake risk in homes.

CBDRR interventions also often struggle with sustainability or leaving a legacy behind when the NGO project finishes (Izumi & Shaw, 2012; Shaw, 2012). Sustainability is dependent on whether the project design facilitates the transfer of project ownership to appropriate parties, and on the resources and commitment of local authorities to incorporate those initiatives into policies to ensure their sustainability. In Nepal, Oven et al. (2017) reviewed the effectiveness of the United Nations led Nepal Risk Reduction Consortium's (NRRC)'s CBDRR projects. This comprehensive report highlights the significance of addressing everyday needs in both rural and urban areas. They also found evidence for the importance of linking livelihood strategies of individuals to DRR initiatives on a local level.

2.4 DRR and everyday risks

In the 2014 World Disasters Report, the concept of risk was discussed: "Risk is itself culturally-defined… [resulting in] the problem that DRR organizations sometimes have a different definition of risk from those of the people affected" (IFRCRCS, 2014, p. 14-15). Positioning a multi-perspective approach to risk suggests broadening the range of perceptions and definitions of risk based on different groups of residents. Otherwise the risks that are actually managed through policy and practice result in excluding certain voices (Ruszczyk, 2019). Research from Bolivia (Sou, 2014), Nepal (Ruszczyk, 2017) and from the Philippines (Ramalho, 2019a) argue for directing greater attention towards "everyday" rather than "exceptional" risks. Framing disasters associated with natural hazards as destructive natural phenomena continues to veil the socio-cultural construction that generates exposure and vulnerability to disaster risk (Lavell & Maskrey, 2015). It has also relied on centrally administered, technocratic solutions designed and controlled by 'expert' knowledge networks that are usually male-dominated and/or Western-based (Bankoff, 2003). Such constructions render local values and perspectives invisible (Bankoff, 2004; Hewitt, 1997). Furthermore, global discussions of risk in the Global North do not necessarily reflect the range of risks and tend to overlook the perception of risks at the local level in the Global South (Ziervogel et al., 2017; Ruszczyk, 2018; Ramalho, 2019a). Directing attention to everyday risk also speaks to the possibility of sustainability in DRR efforts.

3. Methodology

3.1 PAR Initiative

PAR involves working with local people to understand the current situation and to then develop people's capacity to organise and collectively act (McCall & Peters-Guarin, 2012; Brun, 2009). The PAR initiative was led by NSET's Community Based DRM division director, community mobilisers (female and male), geologist, an independent Nepalese researcher who conducted the follow up interviews eight months after the participatory action oriented research was completed, and three UK academics who supported the overall initiative and led on the academic writing. The emerging analysis of the PAR was a joint effort combining NSET experts, the independent social science Nepalese researcher and UK human geographers.

The fieldwork for the PAR initiative was led by NSET and was comprised of two distinct periods over 19 months: the first fieldwork occurred during an eight-month period between May 2018 – January 2019. During this time, the scoping trips to choose the municipalities and specific wards to be involved, the risk perception survey, the awareness raising activities and the implementation of two small-scale mitigation interventions took place. The second distinct fieldwork period was in September 2019 during an independent social science researcher investigated the emerging impact and lessons learnt of the PAR.

3.2 Sites for PAR

This PAR initiative was implemented in two different locations in Kathmandu Valley – one urban and one rural, each with a geographically contained community of 50 to 100 households. NSET selected the two communities based on the following criteria: firstly, presence of at least two hazards in the local area; secondly, historically limited number of DRR projects implemented in the area; and thirdly, presence of local support from the local authority and residents for one mitigation activity to be jointly financed and implemented. The PAR was initiated in two communities: rural Bhainse Ward No.3, of the Bagmati Gaupalika[4] and urban Tajhya Tole Ward No. 21 of the Lalitpur Metropolitan City (Fig. 1).

[4] *Gaupalika* refers to a rural municipality which is a newly formed administrative division in Nepal after 2017.

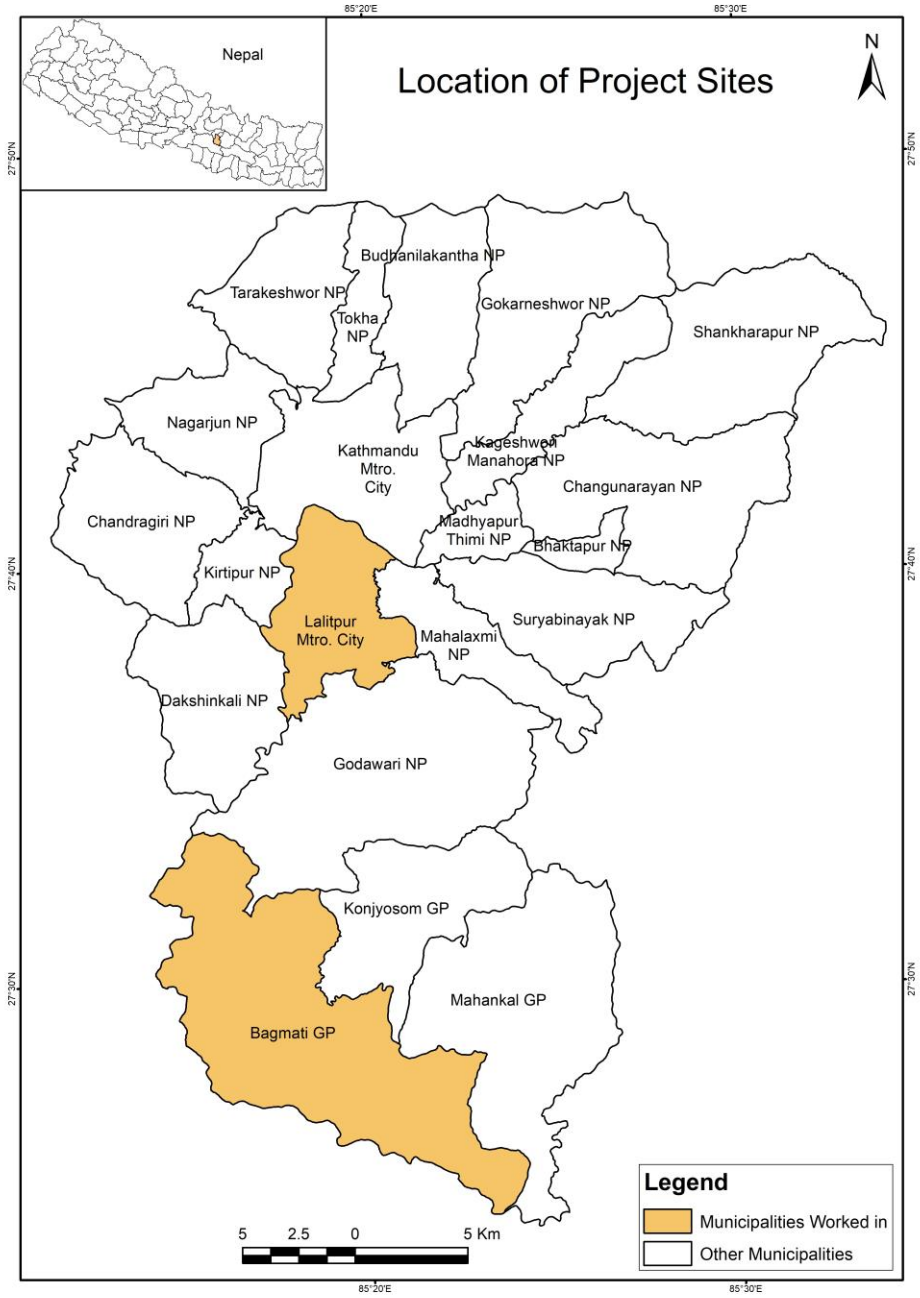

Figure 1 Locations of Bagmati Gaupalika and Lalitpur Metropolitan City
Source: NSET (2019)

3.3.1 Rural Bhainse

Bhainse Ward No.3, Bagmati Rural Municipality is located in the hilly terrain of South-East Kathmandu Valley (Fig. 2). Before 2017, this was a Village Development Committee but now it is a ward of a municipality, one of the 753 local governments in Nepal. The ward is the lowest level of political unit within a municipality. To be precise, Bhaine is one of the settlements in Ward Number 3 of Bagmati Municipality. Bhainse is comprised of 40 households from various ethnic groups including the high caste Brahmin, Chetri, Magar and Dalits with a total population of 200 residents. Agriculture is the main source of income for the households. Residents sell vegetables, milk and poultry products. A few residents are employed by the government and some are teachers. The landscape is very problematic for the residents; the ridge of the mountain containing Bhainse Village has steep slopes towards the east and west

making it vulnerable to flooding and landslides. Bhainse is also highly vulnerable to earthquakes as are most parts of Nepal. Neither the government nor NGOs had any programmes related to DRR until after the 2015 Gorkha Earthquake in Bhainse. This earthquake affected all the existing buildings and most of them were demolished beyond repair. Three years later, most buildings were either under construction or almost completed when this research began in 2018. Reconstruction of buildings after the 2015 Gorkha earthquake has been the only DRR intervention in Bhainse. The heterogenous rural community also experienced frequent flash floods and small landslides in the past. The female residents were self organising in a financial cooperative and they expressed a desire to enhance their skills through this action research.

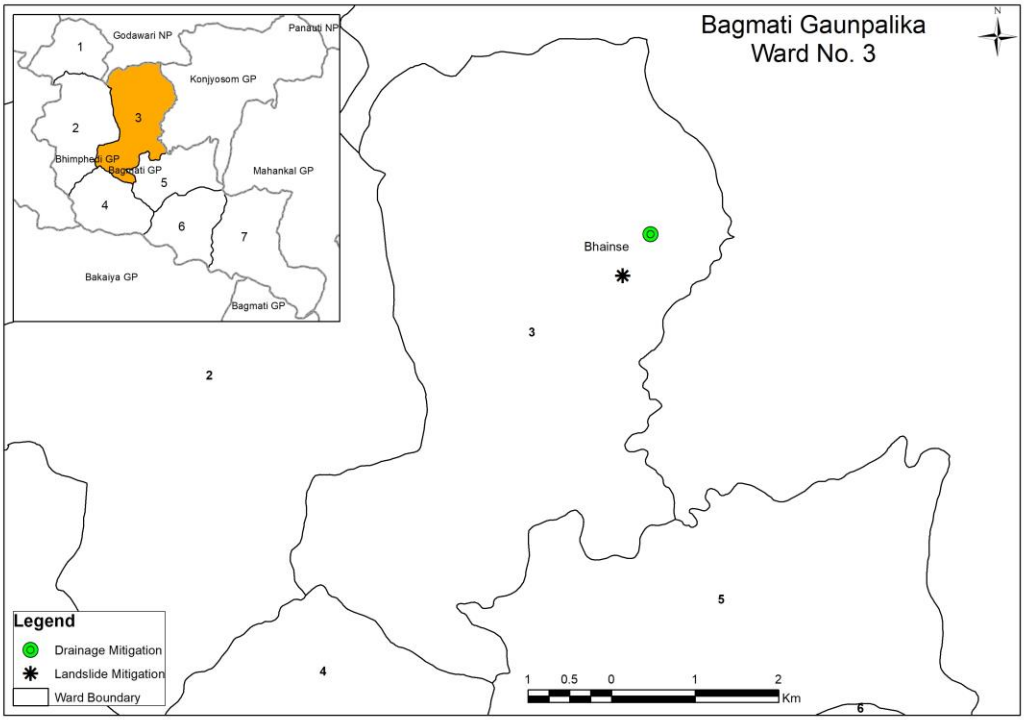

Figure 2 Bhainse Ward Number 3 of Bagmati Rural Municipality
Source: NSET (2019)

3.3.2 Urban Tajhya

Tajhya Tole in Ward No. 21 which is part of Lalitpur Metropolitan City (Fig. 3) is a historically "core" area of an old urban settlement with 80 households in the former Karyabinayak municipality. Tajhya means "large window" in the indigenous Newari language. The compact core settlement of 330 persons living in 80 multi-generational households belong to Newars, one of the ethnic groups which are the traditional inhabitants of Kathmandu Valley. Most of the people in Tajhya are engaged in cottage industries such as carving or timber, working as gold smiths as well as working with agriculture. Ward number 21 has conducted a series of awareness and training programs related to CBDRR over the past decade. A Local Disaster and Climate Resilient Plan based on a vulnerability and capacity assessment was supported by Nepal Red Cross Society (NRCS) along with NSET and other DRR organisations to the then named Karyabinayak Municipality. Implementation of the plan was about to begin when the 2015 Gorkha Earthquake occurred. Most of families during this PAR were struggling to reconstruct their houses which were heavily damaged by the 2015 Gorkha Earthquake. The earthquake has damaged most of the houses beyond repair. Since 2017, the political

restructuring of Nepal led to the changing of Tajhya Tole's[5] status to one of the core settlements in ward number 21 of the Lalitpur Metropolitan City (LMC). During the fieldwork, the ward began planning to initiate implementation of its developed disaster management plan. When NSET approached the Tajhya Ward and community members, they were very interested to collaborate in this PAR.

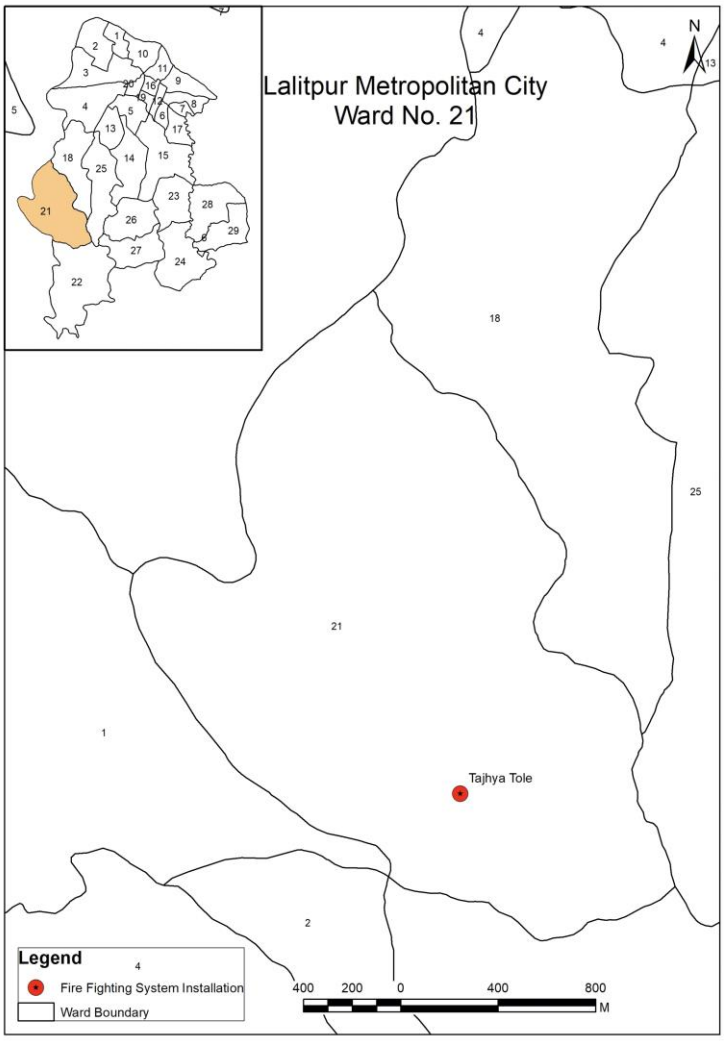

Figure 3 Urban Tajhya of Khokana ward Number 21 LMC
Source NSET (2019)

3.3 Methodological tools utilised

During this PAR, the following methods were utilised to attempt to empower women in CBDRR, this includes semi-structured interviews, a risk perception survey, CBDRR awareness raising activities and lastly, discussion, planning and implementation of mitigation activities.

3.3.1 Semi-structured interviews

NSET interviewed the local authorities and representatives of the communities before initiating the PAR in Bhainse and Tajhya in order to assess their interest in collaboration. Then NSET

[5] Historically, a tole designates a neighbourhood of around 80-100 households.

introduced the PAR to the local government leaders in the two communities and met with local stakeholders (including representatives of women's groups and community groups) to explain the goals of the PAR in CBDRR and its collaborative ways of working with residents and local authorities. NSET was clear in their communications with the local partners that they were interested to work with, empower and build the capacity of women. In the second phase of the fieldwork, the independent social science researcher interviewed twelve individuals (government officials from the municipality, ward level, tole level as well female residents involved in the project, as well as NSET colleagues) to assess change created by the PAR.

3.3.2 Risk Perception Survey

The risk perception survey was the first activity carried out by NSET's community mobilisers. Three sets of questions with multiple choice answers were asked. The first set was aimed at gathering information about knowledge of existing problems and hazards. The second set of questions explored perception of disaster risk reduction and the third set was about risk transfer. The risk perception survey was carried out in both Bhainse and Tajhya. A total of 96 people participated (54 respondents in Bhainse and 42 in Tajhya) and 77 percent of the respondents were women. The respondents were between the ages of 20-60 and represented the local communities in terms of ethnicity. In Bhainse, there were 18 male and 36 female participants in the risk perception survey which was conducted in a hall of the local school. The 54 respondents represented all four groups living in the area: high caste Brahman, Chetri, Magar (ethnic group originally from northern mountains in western Nepal) and Dalits. Tajhya is a Newari community. The Newars are one of the major indigenous ethnic groups of Nepal and are believed to be the original inhabitants of Kathmandu Valley. There were 4 male and 38 female participants in the risk perception survey conducted at the 21 LMC ward office. The surveyors used a multimedia power point presentation to display the questions and relevant multiple choice for each question. Participants answered the questions by choosing one of the options with a remote voting pad. This process enabled the respondents to respond without being influenced by others. The survey results were displayed after the survey was completed to all the respondents and collectively discussed. A response from each individual was not recorded based on their profile because this survey was implemented in order understand the risk perception of women in general and to identify the existing hazards, to set priorities and lastly to begin to identify a hazard and its mitigation intervention.

3.3.3 Awareness raising activities and small-scale mitigation interventions

Awareness raising programmes on DRR issues were organised for community members and the newly founded disaster management groups from each community after the risk perception survey. More than 80 % of the female members of the communities (120 households) participated in these events. A Hazard and Vulnerability and Capacity Assessment (VCA) was conducted. A Disaster Risk Management Group (DRMG) was formed in both communities (consisting of three male and ten female members representing the composition of the households in the tole) after the awareness raising programme in order to plan and carry out the mitigation intervention. The DRMG was created for the purpose of the PAR. The groups discussed and chose the small-scale structural and non-structural mitigation interventions to be implemented based on the survey results of the identified potential hazards, the VCAs as well as the assessed risk and existing capacity within the community. Subsequently, the mitigation interventions were carried out in partnership with NSET and the local authorities who provided institutional support and in the case of Tajhya, financial support. A memorandum of understanding was signed between NSET and the communities clearly specifying the roles and responsibilities of NSET and the community leaders in the implementation of the small-scale mitigation priority actions. NSET provided assistance to the women leaders in preparing the

proposals for small-scale mitigation interventions including budget and preliminary action plan for implementation. NSET also helped the women organisers who needed to request support from their respective local authorities in the formulation and implementation of the physical interventions. All of the activities listed in section three (introductory meetings, risk perception survey, DRR awareness programme, VCA, identification and listing of existing hazards, prioritization and selection of small scale mitigation program, and lastly, preparation of small scale mitigation proposals and formal documentation) was conducted in blocks of three to four hours with the exception of the hazard mapping and VCA which was a one day activity. The time specifications were requested by the female participants who could not spare an entire day for the activities due to their work related to family and agriculture (in Bhainse). The completion of the activities required nine full days spread out over many weeks. The additional time needed for implementation of the mitigation interventions varied between the PAR sites.

4 Findings

4.1 Results of risk perception survey

The survey results show (Table 1 below) that supply of drinking water and lack of livelihood opportunities are the biggest problems facing the communities in Bhainse and Tajhya Tole. The survey reveals that supply of drinking water and landslides are existing hazards in Bhainse while supply of drinking water and earthquakes are the perceived hazards in Tajhya Tole. Furthermore, 49% of the participants in urban Tajhya Tole reported having no existing preparedness efforts for domestic disaster-related loss and 68% of them reported no preparedness efforts in the community (even after the earthquake in 2015). Both communities acknowledge the importance of capacity development in DRR, with 34% in Bhainse and 38% in Tajhya Tole stating that this is the most important factor for DRR in their community. The results of the survey will be useful for NSET and for the local authorities in the future when they consider how to work with residents. Unfortunately, the results were not disaggregated by profiles of residents based on the intersectionality of gender, caste/ethnicity, age, and education. It would have been beneficial to learn if there were any particular factors that led residents to answering questions in a particular way.

Table 1 Risk Perception Survey in Bhainse and Tajhya Tole

	Risk Perception Survey Question	Response from the community	
		Bhainse, Bagmati Rural Municipality 3	**Tajhya, Khokana Lalitpur Metropolitan City 21**
Knowledge about Problems and Hazards			
1	The biggest problem regularly faced	30% Drinking water 23% Agricultural market 21% Transportation	40% Livelihood 32% Drinking water 22% Transportation
2	Existing hazards and risks in your community	78% Drinking water 16% Landslide	51% Drinking water 49% Earthquake
3	Reason behind the existing hazard/risk	42% Weak construction 31% Topography 12% Human behavior	46% Damage to Infrastructure / buildings 43% Injuries and death
4	Problems to be faced after a disaster	60% Collapsed structure 16% Loss of property 12% Loss of life	51% Weak structures 30% Poverty 14% Fate / Fortune
Perception of Risk Reduction			
5	Can we prevent damages due to disasters	70% Yes to some extent 30 % Can't be prevented	81% Yes to some extent 11% Do not know
6	From where did you get information regarding DRR	70% TV/ Radio 16% Friends	62% Training programs 35% TV radio
7	What type of preparedness have you done at home to prevent loss due to disaster	46% Family discussion 46% Emergency supplies and first aid	49% Nothing 16% First Aid Kit 14% Emergency supplies and first aid kit
8	What type of works have been done in your community for DRR	41% Safety of water supply intake 28% Identify hazardous area 28% Nothing	68% Nothing 21% Identification of hazardous area
9	The most important task of DRR in your community	34% Capacity development in DRR 25% Community mobilization 14% Awareness in DRR	38% Capacity development in DRR 27% Community mobilization 16% Hazard mapping
Risk Transfer			
10	What would happen in this community in case of an earthquake larger than the 2015 Gorkha Earthquake	62% Heavy loss of lives and property 27% Do not know	95 % Heavy loss of lives and property
11	Do you know about existing Insurance policies in Nepal	51% Livestock insurance 29% Agriculture insurance 20% Health insurance	80% none 20% life insurance
12	What are the insurance policies that you have used	36% Livestock Insurance 27% Life Insurance 24% None	89% None 11% Life insurance

4.2 Implementation of small-scale mitigation interventions

After discussion and consultation with NSET, the female led DRM group in rural Bhainse decided to work on a small-scale landslide mitigation project focusing on a landslide. This was a process that took time and energy on behalf of the DRM and NSET in consultation with residents and the ward. The hazard mapping and VCA, the identification and listing of hazards followed by prioritisation and selection of the mitigation interventions was slowly and carefully implemented to gain consensus of all parties involved. The DRM and residents acknowledged that the whole community would be at risk if the landslide continued to occur, even though only two households living on top of the landslide directly benefitted from this intervention. The community developed a two-pronged mitigation measure while a geotechnical professional from NSET provided knowledge and expertise to evaluate the viability of the idea. The female led DRM group was very active in the decision-making stage but did not feel comfortable in the actual implementation phase due to the hard-physical labour involved. They transferred the responsibility for the actual implementation to their male counterparts who carried out the labour while the women led DRM group continued to manage the finances and coordination of the work with facilitation from NSET.

Following a similar process to that undertaken in Bhainse, the community members in urban Tajhya Tole decided to install a community-based fire response system capable of managing a fire up to a height of five stories. The decision was based on the physical constraints posed by the narrow lane that is not accessible by fire trucks thus putting 80 households residing along the lane at risk. Meanwhile, a natural pond with perennial source of water provided a reliable supply of water for emergencies. Twelve female members of the DRR group learnt how to activate the fire response equipment. They actively participated in the fire response exercise training programme with the presence of their ward chairman. Although the women actively participated in problem identification, prioritisation activities, as well as being trained how to use the equipment, they were not actively engaged in the implementation. The fire response system was installed and commissioned amidst a gathering led by the ward president. Control over this highly visible and needed intervention in the urban area was taken by the local authority who will be now be responsible for fire-fighting.

5 Discussion

While PAR as a field of research is concerned with tackling and changing or improving the places within which researchers collaborate with local stakeholders, there are often shortcomings, limitations or critiques to be considered. Some of these are discussed below.

5.1 Evidence of women's empowerment and capacity development

The NSET training programmes provided women the resources, knowledge and skills to be empowered. The PAR successfully mobilised more than 60 women from both communities and increased their sense of responsibility and capacity in local disaster-related activities. The women reported that their knowledge and skills have increased considerably through the training programmes. This PAR increased women's confidence and strengthened women's capacity and capabilities to take part in communal activities for DRR (on top of their unpaid household responsibilities). For example, one female participant in urban Tajhya Tole expressed:

> "Men usually go out to office and females are mostly at home, so the problem is for women. If any emergency happens, it will take time to call them [husbands], so it is important to integrate women in disaster related programmes. After the training, I feel we can do it, we can learn. So, I am happy and more confident".
> (Interview, 23/9/2019)

This research shows the importance to consider residents' perceptions of risk. Often this means considering people's interpretation of everyday risks and hazards rather than focusing on a hazard that is more infrequent. The women in rural Bhainse chose to focus on a small-scale landslide mitigation project. This interviewee from the disaster management group said:

> "It was a new experience for us. We were involved along with masons".
> (Interview, 13/09/2019)

The women in Bhainse felt empowered due to their sense of ownership of the overall process including the implementation phase. The female coordinator of the disaster management group in Bhainse explained:

> "Women can move ahead. There is nothing that women can't do. We formed the group with 18-20 people… After we inspected the disaster sites in the community with the coordination of NSET we decided to work on the mitigation of landslide site in our community".
> (Interview, 13/09/2019)

The overall management role gave the women a sense of pride and confidence. An additional female DRM member in Bhainse explained:

> "We felt this project was for us and we did it ourselves. We planned the work, we prepared the budget, we decided what and where to do and implemented the work, so we have ownership in this work. We fed the mason, managed [our] household work and updated NSET about our work regularly".
> (Interview, 13/09/2019)

The Bhainse ward president also thought that focusing on women as part of a DRR strategy was appropriate:

> "Women are honest and did the work effectively… men would have manipulated the cost in masonry work […] I found women are eager to learn and they are fully devoted. Men usually take it for granted but women take it more seriously […] Women interact more in groups. They take time to make a decision, but they stick to it after they make the decision and possess ownership of work which made the work successful".
> (Interview, 13/9/2019)

Not only did the women feel empowered but the local authority was acutely aware that the female led DRM committee managed the money very effectively. Historically, women's vulnerabilities have been related to pre-existing gender inequality and power differentials that restrict their access to resources and undermine their capacity to respond and participate (Bradshaw & Fordham, 2014). This PAR into CBDRR challenges the stereotyped perception of women being vulnerable to a new perceived reality that emphasises women as active agents (Gaillard, Fordham, & Sanz, 2015; Moreno & Shaw, 2018). The space created by the PAR amplified their voices, showed women are not only capable but should be given the opportunity to participate and supported to do so, even if it adds additional time burdens to their lives. By engaging people who have been historically excluded from DRR discussions, their perception and definition of risks and hazards help to make these everyday risks and hazards more visible (Ruszczyk 2014, Ruszczyk, 2019; Ramalho, 2019a) and even managed.

Capacity development speaks to the call of empowering local groups through DRR as established in Hyogo Framework for Action and gender empowerment in the Sendai Framework for DRR. In spite of the fact that the PAR was short term in duration and with

limited funds (total budget for the PAR was £10,000 primarily utilised for the mitigation interventions and NSET's labour was their significant in-kind contribution). This PAR has enhanced the capacity of women and the groups they are involved in to assess existing hazards, risks and then addressing the situation.

While NSET learnt that women are more than capable in taking collective decisions for planning activities, they also learnt that women can be reluctant in implementing the mitigation activities not only due to the hard-physical labour needed but also to constraints imposed by society around gender roles. Another unresolved tension is the need to not overload women with additional responsibility over and beyond their tremendous and time-consuming everyday obligations. Empowering women through disaster risk reduction is possible but it does not address other aspects of power relations in the everyday lived experience of women and their lack of full empowerment. Women's vulnerability in the everyday is still not addressed nor can it be by a single PAR initiative into CBDRR.

5.2 CBDRR relationships between local authorities and residents

In addition to the physical small-scale CBDRR mitigation interventions that were clearly visible to and in both communities, this PAR has initiated other changes in both communities. In Bhainse, this work has led to another DRR mitigation intervention being initiated and completed. Women became more aware of the problems facing the community and so the DRMG in Bhainse requested NSET to explore the possibility of diverting the storm drainage from the main road after the completion of the landslide mitigation work. The DRMG identified the need to manage a large pothole that impeded movement of people and cattle during monsoon season. A four-meter long aqueduct and 30-meter long pipe drainage were subsequently built to divert the flood water from the main road to a nearby stream after consultation and approval by local government officials. This has further boosted the aspirations of the DRMG, enhanced their self-esteem and linked their DRR activities to livelihood strategies, according to the women's groups and ward president. The action-based research has created a mechanism where the needs of the community can be articulated to and subsequently addressed by the local authority in partnership with its residents. A continuum of risk is also being addressed.

Sustainability or considerations of legacy of the CBDRR programmes is particularly dependent on the commitment of local authorities to incorporate the initiatives into local policies and actions. While external organisations can assist in empowerment through awareness raising, capacity development and professional support, local authorities are vital in creating a constructive environment in which women's participation is recognised and community engagement is encouraged. Acknowledging the importance and benefits of engaging women in DRR, both communities have subsequently increased the allocation of funding for DRR projects. No local government DRR plan existed in Bhainse before this research, but through its involvement in the PAR, the ward has recognised the importance of CBDRR and thus allocated funds in the next annual budget. Similarly, after the instalment of fire-fighting equipment in Tajhya Tole, comparable solutions are being introduced and adapted into four other communities that have ponds in their local areas in Lalitpur Metropolitan City as a best practice in CBDRR. In the words of a local authority representative, the Chairperson of Ward number 21 of LMC:

> "We have planned to start and install this initiative in four other ponds in this area. The project will be working with women because women and children are the victims during emergency, so women's meaningful participation is important".
> (Interview, 23/9/2019)

Both local authorities acknowledge that historically, their focus has been on response and recovery. Local authorities are aware they need to learn to focus on preparedness, mitigation and prevention measures. Until now there has been a lack of community engagement plans related to disaster management. Now local authorities are more responsible for disaster related issues (after decentralisation of functions in 2017 and local elections) and also control local disaster funds. The significance of the quality of the relationship between local authorities and community members cannot be stressed enough. This is essential to successful CBDRR efforts. The newly elected local authorities are learning how to engage with their residents and simultaneously, community members are learning what to expect from their local authorities and what they should offer to the local authorities in order to have their concerns met. In both communities, women mentioned that participation in the PAR has not only increased their understanding and knowledge about DRR, but it has increased their sense of individual and collective responsibility in relation to disaster related activities in their communities. The local authorities are learning that community members, especially women will help them meet their legal and societal obligations for disaster risk management. If women are given opportunities to become members of the now legally required DRM groups of the municipalities and wards, there could be opportunities for change to be institutionalised. The possibility remains of women being excluded from formal decision making (Jha, no date). How this situation will evolve remains to be seen.

5.3 Sustainability of initiatives

It appears that the PAR was more effective in the rural tole (Bhainse) than in the urban tole (Tayhja). For NSET, working in the rural community was slightly easier than in the urban community. It is unclear whether this is due to the rural nature of Bhainse, due to the heterogenous profiles of the women (Brahmin, Chetri, Magar and Dalits), or due to the local choice of small-scale intervention. The women were very active, participation was more frequent and richer in content in the Bhainse DRM group compared to Tayhja's DRM group. Through the mitigation project, a link was created between disaster mitigation and livelihood strategies (similar to Oven et al, 2017); this may have increased the participation and empowerment of community members and the overall effectiveness of the Bhainse intervention. The urban community of Tayhja was overwhelmingly comprised of Newars, and the women were active in the training programmes and general discussion but during the implementation phase of the mitigation project, the local authority took control and ownership of the initiative and the disaster management group (comprised primarily of women) was side-lined. This may have been due to the choice of mitigation intervention. The local authority is responsible for fire-fighting. On a positive note, the local authority thought the initiative was worth supporting and began replicating this initiative in other locations.

The main fieldwork period for this PAR was conducted over a short period of nine months. It is very difficult to build sustainability into an initiative over such a short period. A learning for NSET is social value systems as well as community and power dynamics should be more fully understood before an NGO intervention is initiated. More attention and care for a fuller appreciation of power dynamics within the communities and the potential for risk mitigation that serves the powerful instead of the more marginalised in the community (Brun, 2009; Pain 2004; Cooke & Kothari, 2001) is a lesson learnt for the future. NSET learnt that they need to be able to look at the problems within the community through the eyes of community members and find out solutions to the problems jointly with the community and not focus exclusively on earthquake mitigation. This is related to the continuum of risks (Ziervogel et al, 2017; Ruszczyk, 2018). The risk perception survey helped to address this problem. A key learning

for NSET is that sustainability of projects requires a more comprehensive project design that acknowledges and facilitates the transfer of ownership. Despite the advantages of CBDRR, sustainability of initiatives is an issue especially after the NGOs withdraw technical, financial and management support (Izumi & Shaw, 2012; Shaw, 2012). Ongoing training programmes should be provided to strengthen the capacity of the community or specific groups to carry out similar activities in the future on their own or with the local authority. A sustained system of training programmes for local authorities and community members is required. This was beyond the remit of the research, but it is an important reflection for action-based research. While NSET acknowledges that one off short-term interventions are not sustainable, national NGOs do have the capacity to influence both national and local priorities in DRR and disaster management (Ruszczyk, 2019) because they have more practical engagements on the ground with diverse groups especially those who are marginalised (Jones et al., 2014). This provides a productive environment for NGOs to further empower marginalised groups in DRR discussions and efforts on a range of scales from the local to the international.

6 Conclusion

In this research paper we have presented a comparative case study of PAR in CBDRR in Kathmandu Valley during the time period of 2018-2019. This PAR details a collaboration between residents (mostly women), the local authority in the form of the ward level and a non-governmental organisation with DRR expertise that is valued in the community. This triumvirate worked relatively well because each partner had different resources that were essential to linking DRR to everyday risks that mattered in the community. Even though the impact of the earthquake was clearly evident in both the urban and rural communities (most buildings were damaged in both the urban and rural sites), the disaster management committees (primarily female residents) chose to focus on other hazards and risks in their communities. Landslides and fires were the hazards addressed in the mitigation projects.

This research highlights not only the willingness of women to be involved but more importantly their willingness to lead efforts – if they are allowed to play this role. The female led DRMG manged the projects and the funding efficiently and effectively. The women have been empowered to not only think about DRR but to also act in ways that will be of benefit to their communities for the short and medium term. Local governments were willing to work with the women while there was expert knowledge available from NSET to guide the mitigation projects. It is not clear what will happen in the future. This PAR shows nuanced tensions between relationships in the urban and rural areas as well as highlighting the need for sectoral expertise to be available for mitigation projects. The learning from this research will inform NSET's national and international strategy for building capacity of local authorities to engage in and support CBDRR efforts.

A gap remains between aspirations to practice empowerment of women and implementation. In many ways, 'doing' empowerment remain problematic in CBDRR. This leads to questioning of what constitutes meaningful empowerment in these complex and overlapping processes of 'bottom-up' participation and local resilience-building, in terms of both the process and the outcome. The relationships between gender, resilience and sustainability, and their interlinkages with DRR and the everyday lived experiences of residents in urban and rural neighbourhoods warrants further thought and subsequent action.

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