

Research Article**ROLE OF SOCIAL CAPITAL ON FLOOD RESILIENCE CAPACITY: EVIDENCE ANALYSIS FROM SUSTA NAWALPARASI PASCHIM, NEPAL**

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ABSTRACT

Social capital is the interaction and inter, or intra relationship among family, community, and external groups. There are three types of social capital: bonding, bridging, and linking to enhance flood resilience and make the communities better prepared. Flood resilience is the coping capacity of the community to prepare, respond, and recover from a flood shock, or stressor. A study was done to understand the role of social capital on flood resilience in the two communities i.e. Kudiya and Paklihawa of Susta municipality of Nawalparasi Paschim. Accordingly, household survey, Focus Group Discussion (FGD), and Key Informants Interview (KII) were carried out to collect the qualitative and quantitative data and information. The analysis of the data and information shows that among the three social capitals, bonding and bridging social capitals are quite strong in the communities, but linking social capital is weaker. 94% of the 402 respondents reported to have engagement with other community members, or groups whereas 91% respondents reported that they have stronger community to community coordination, and 67% respondents opined that they do not have access to external resources. The linking social capital needs to be strengthened to enhance flood response capacity of the two communities. It means that local government should work closely with local communities as per their needs and requirement and leverage the funds to the communities.

Key words: Flood resilience, social capital, resilience capacity

INTRODUCTION

Social capital can be described as the quantity and quality of social resources (e.g. networks, membership in groups, social relations and access to wider institutions in society) upon which people draw in pursuit of livelihoods (Frankenberger & Garrett, 1998). Political institutions may be encapsulated in political capital, but social capital is broader than political capital because it includes informal social processes at individual, household, and community levels. Social capital has often been described as the “glue” that binds people in society together (Aldrich, 2012). Close interaction between people through tight-knit communities, the ability to rely on others in times of crisis, and open communication between stakeholders’ groups are all generally seen as signs of well-developed social capital (Frankenberger et. al. 2013). Aldrich (2012) divides these three types of interactions into binding, bridging, and linking, where binding refers to interaction between people in the community, bridging is interactions between communities, and linking is maintaining relationships with stakeholders.

Social capital is one of the five capitals, or assets (social, natural, economic, physical, and human) that contributes to the development of sustainable livelihoods of a given community. Social capital builds the trust for cooperation, learn and empower one another as they build and seek to benefit from the other capitals. Achieving meaningful gains in the other capitals is not likely without attention paid to social capital. Hence, the extent and application of social capital strongly influences community flood resilience (Aldrich, 2012; Elliot et al., 2010; Magis, 2010; Wilson, 2012).

Defining resilience

Resilience is defined, as a capacity that ensures stressors and shocks with having no long-lasting adverse development consequences (Constas, Frankenberger & Hoddinott, 2014). Household resilience is the ability of a household to mitigate, adapt to, and recover from shocks and stresses. While resilience itself is an ability to manage, or recover, resilience capacities are a set of conditions, attributes and skills that are thought to enable households to achieve resilience in the face of shocks. At the household level, these conditions can be classified into three categories (Constas Frankenberger & Hoddinott, 2014): (a) absorptive capacity- is the ability to minimize exposure to shocks and stresses (ex-ante) where possible and to recover quickly when exposed (ex post); (b) adaptive capacity- that involves making proactive and informed choices about alternative livelihood strategies based on changing conditions, and (c) transformative capacity- that relates to governance mechanisms, policies/regulations, infrastructure, community networks, and formal safety nets that are part of the wider system in which households and communities are embedded. Transformative capacity refers to system-level changes that enable more lasting resilience.

Community flood resilience

“A community is resilient to flood when it can function and sustain critical systems under floodstress

caused by; adapt to changes in the physical, social, and economic environment; and be self-reliant if external resources are limited or cut off.” (Mueller et al., 2013). A defining feature of flood community resilience is the extent to which communities can effectively combine social capital and collective actions in response to flood shocks and stresses.

At the household level, social capital is viewed as one of key capacities that have a direct bearing on resilience to flood (Frankenberger et al., 2013). However, it is the complex and dynamic interactions that take place within and between larger populations; social capital can also have a predominantly strong influence on the attainment of resilience at the community level (Aldrich, 2012; Cutter et al., 2010). For instance, floods or any disasters may sometimes enhance social capital because they activate or give rise to neighborhood associations and collective organizations that can be used to disseminate vital information, provide community members with a voice, and afford leverage to assist in taking control of rebuilding efforts (Aldrich, 2012).

There are three types of social capital; bonding, bridging and linking (Figure 1) to enhance resilience. Bonding social capital is seen in the relationship between community or group members. Bridging social capital connects members of one community or group to other communities/groups and linking social capital is often conceived of as a vertical link between the community to the external government or non- government stakeholders (Aldrich, 2012).

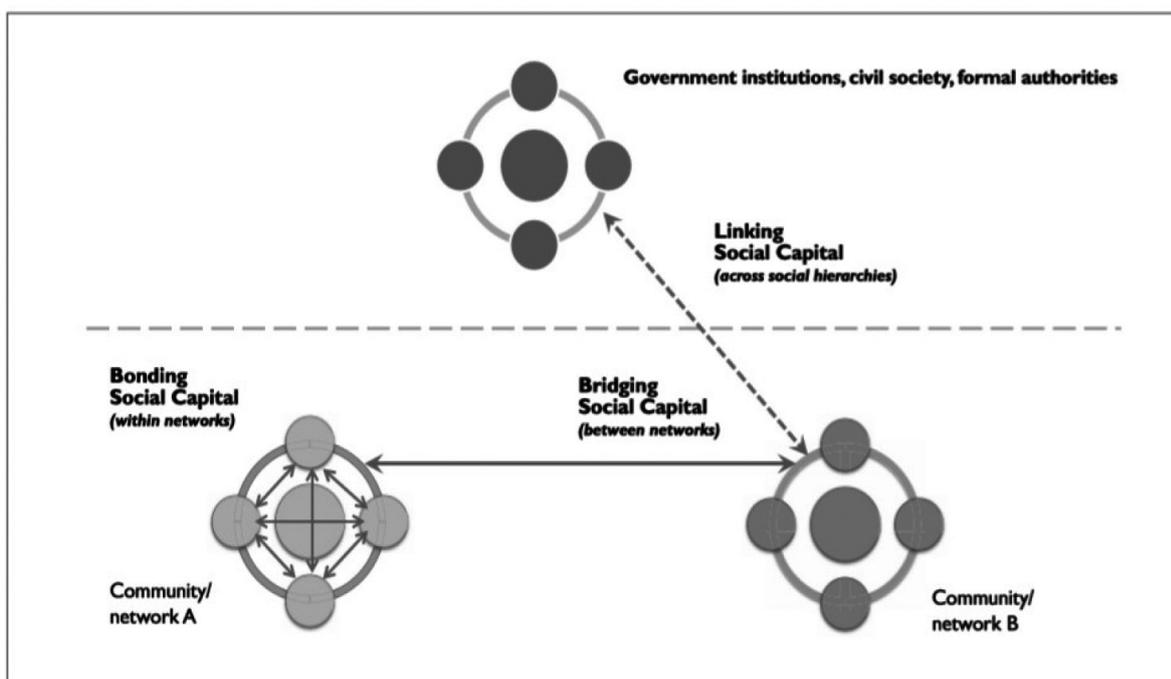


Figure 1: Bonding, bridging and linking social capital (Source: Aldrich, 2012)

This paper is a part of the PhD research which has adopted modified Sustainable Livelihood Framework (SLF) as the conceptual framework for community flood resilience. The SLF includes livelihood capabilities, capacities, assets and activities needed for a means of living. SLF includes five major capitals: Human capital, social capital, natural capital, financial capital and physical capital (Humagain & Devkota, 2018). The paper has focused to *social capital* of the above Framework. This paper thus assesses the role of social capital on flood resilience capacity of the communities from Susta rural municipality in Nawalparasi district of Nepal. Susta is one of the flood prone municipality under Nawalparasi districts in the Nepal. Narayani river adversely impacts to Susta in the districts almost every year, (Dixit, 2008)

MATERIAL AND METHODS

The study data and findings presented in this paper are a part of the ongoing PhD research being carried out at Agriculture Forestry University (AFU), Rampur, Chitwan, Nepal. Paklihawa and Kudiya communities of Susta Rural Municipality in Nawalparasi Paschim district under the Province Five were chosen to gather and examine empirical evidence on the role of social capital on flood resilience capacity. Kudiya and Paklihawa of Susta Rural Municipality are the most flood prone communities in Nawalparasi Paschim district and these research communities are vulnerable to monsoonal flooding almost every year. The communities regularly facing

and responding to flood events was thought suitable to select for the research as it would provide evidences for the role of social capital in community resilience. The communities were selected purposively using the following criteria: (a) severity of annual flood, (b) upstream and downstream communities within the district, and (c) distance from the river side (highly exposed and less exposed to the river)

Mixed research method was applied to collect both qualitative and quantitative data for the research purpose. Primary data was collected by administering household surveys with 402 households of respective communities, which was supplemented by information gathered using 4 Focus Group Discussions (FGD) and 4 Key Informant Interviews (KII) in the two communities. FGDs were carried out in the mixed groups (male and female) and KIIs were carried out with community leader, ward representative and mayor or deputy mayor, who has extensive knowledge and information about flood and its impact in the respective communities. The secondary data collection included review of literatures, articles, published and unpublished materials and books.

10538 households is the population that includes the both communities, where 5362 households are in Kudia and 5178 households are in Paklihawa. The sample size for household survey was calculated with a formula established by Yamane (1967:886): $n = \frac{N}{1 + N(e)^2}$; Where: n = sample size, N = population size of the households in the rural municipality and e = level of precision.

Based on desired 95% confidence level, 402 households was calculated as the sample size for the study within the two communities. The sampling strategy was adopted as stratified multistage sampling to be able to capture the scattered study communities. In the first stage, a stratum of vulnerability based on the distance from the river was created. The second stratum was created based on the vulnerability of upstream and downstream communities. Finally, households were selected randomly within each community from the sampling frame (household list) in the respective communities.

RESULTS AND DISCUSSION

Respondent's demographic characteristics

Out of 402 respondents, 227 (56%) were female and 175 (44%) were male. Higher respondent's age groups ($n=286$, 71%) fall under 26-50 years categories (Table 1)

Table 1. Socio-demographic characteristics of respondents in Kudiya and Paklihawa, of Susta rural municipality

Age Group (years)	Female	Male	Total
15-25	16	13	29
(%)	(7.05)	(7.43)	(7.21)
26 -50	168	118	286
(%)	(74.01)	(67.43)	(71.14)
Over 50	43	44	87
(%)	(18.94)	(25.14)	(21.64)
Total	227	175	402
(%)	(100)	(100)	(100)

Source: Field Survey, 2019

Type of social capital

For this paper, survey data has been analyzed based on the bonding, bridging and linking of the social capital. Accordingly, the following information were collected and interpreted:

Bonding social capital

Bonding social capital refers to the horizontal relations between family members, close friends, and neighbors (Aldrich, 2012), typically among a group of demographically, geographically, religiously, and/or ethnically similar people with shared norms and expectations (Putnam, 2000). Bonding social capital is built on trust, reciprocity, and cooperation and assumes a high level of familiarity, often at the cost of privacy. Table (2) summarizes the inter family or group engagement within a community for social bonding.

Table 2. Family or group engagement within community in Kudiya and Paklihawa, Susta.

Response	Female	Male	Total	Chi-square (p-value)
No	14	9	23	0.266 (0.606 ^{ns})
Yes	213	166	379	
Total	227	175	402	

Source: Field Survey 2019; ^{ns} non-significant at p=0.05

Table (2) shows that out of 402 respondents, 379 (94%) have engagement with other families and groups, either formally, or informally within the community. A total of 23 (6%) respondents do not have engagement with any social groups. From the gender perspectives, the engagement of the female respondent in the family or groups is more than male but are statistically similar ($p>0.05$). Out of 379 respondents, 227 female respondents had responded to be engaged in inter family or social groups. The participants in the FGD and KII reported that higher engagement with inter family or community groups provides moral, psychosocial and physical support during the disasters. The level of family or group bonding is directly proportional to increase or decrease in the resiliency during the disaster. Bonding social capital can help households respond to idiosyncratic shocks (i.e. short-term, small-scale events with negative impacts) because they can request and receive help from unaffected households (Frankenberger et al., 2013).

Bridging social capital

Bridging social capital connects members across communities or groups, often crossing ethnic/racial lines and geographic boundaries, and can aid communities via access to resources, new perspectives, and assets, including remittances. Table (3) presents the information about bridging social capital through community to community coordination and communication.

Table 3. Community to community coordination in Kudiya and Paklihawa, Susta

Response	Kudiya	Paklihawa	Total	Chi-square (p-value)
No	20	16	36	0.445 (0.505 [°])
Yes	182	184	366	
Total	202	200	402	

Source: Field Survey 2019; ^{ns} non-significant at p=0.05

The analysis of the facts shows that there is strong community to community coordination in the both the study area. Out of 402 respondents, 366 (91%) said that they have coordination and communication with neighboring community for any sort of development and social purposes while only 36 (9%) respondents said that they do not have coordination and communication to their neighboring community. The number of respondents with community to community coordination is similar for both Kudiya and Paklihawa. The participants involved in the FGD and KII also reported to have a very high level of coordination and communication for social customs, religious ceremonies, and community works such as for wedding, worshipping, funeral etc.

In recent years, with the intervention of Disaster Risk Reduction (DRR) programs and projects on flood, the communities have developed relationship for communication and support for early warning system, search and rescue, relief and mitigation among the upstream and downstream communities. When resources are lacking locally, people may use their bridging social capital and request support, resources, or information from people in other communities, which can be especially important to bolstering community resilience (Wetterberg, 2004). The study communities have been supporting other communities during flood through community kitchen and flood materials. Indeed, bridging social capital can lead to reduced conflict between groups as individuals learn about each other and common interests. It can also lead to exchanges of information and best practices, which may encourage people to adopt new practices (Frankenberger et al., 2013).

Linking social capital

Linking social capital connects social networks with some form of authority in the social sphere, often across institutionalized and formal societal boundaries. Table (4) analyzes the linking social capital through access of external resources to the community. The external resources include the fund from local or national governments, private sectors, donors, charities. Such funds are provided to the communities especially during the flood or any natural disasters.

Table 4. Access of external resources to the community in Kudiya and Paklihawa, Susta

Response	Kudiya	Paklihawa	Total	Chi-square (p-value)
I don't know	23	12	35	3.931 (0.140 ^{ns})
No	131	142	273	
Yes	48	46	94	
Total	202	200	402	

Source: Field Survey 2019; ^{ns} non-significant at $p=0.05$

Table (4) shows that there is less access to the external resources to the communities. Out of 402 respondents, 273 respondents (67%) responded that they do not have access to the external resources at the communities during flood. Only about one-fourth (23%) of the respondents responded that they do have access to some sort of external resources. Although Paklihawa has a greater number of families with no access of external resources to the community, the number is not significantly different between the villages. ($p=.0.140^{ns}$). The participants of the FGD and KII response about the strengths of external resources that coincides well with the household results. The external resources are very limited and the resource available is not accessible equally to the most vulnerable, or flood affected population. Linking social capital can create feedback loops between otherwise independently operating entities (e.g., community members, grassroots organizations, scientists, government planners) working on thematically or geographically overlapping development interventions Frankenberger et al., 2013). Such vertical links can provide otherwise unavailable resources and information and are therefore important for economic development and resilience (Aldrich, 2012).

Communities with higher levels of these three types of social capital are more resilient than those with only one or no social capital (Aldrich, 2012; Elliot et al. 2010; Woolcock & Narayan, 1999). While – or because – each type of capital is well-suited for responding to different types of shocks and building different types of relationships, no one type of capital is more important than the others; they must be developed and sustained together to ensure community resilience. Among the three social capitals, bonding and bridging social capital are good whereas the status of linking social capital seems weaker. It looks that support and cooperation from local government to the communities are not enough. Local government's resources need to be leveraged as per the community needs and requirements; however, these could be strengthened with additional research.

CONCLUSION

The overall result analysis of the social capacity and qualitative information from the household survey as well as FGD and KII shows that all three social capitals is vital for community flood resilience. Bonding and bridging social capital are quite stronger in two communities but the linking social capital is found to be weaker. The communities are capable for internal coordination, communication, and support for flood response. However, in case of extreme events, when external support is required, they face challenges to respond. The participants in the study communities during FGD and KII responded that had there been strong external support, it would have increased community flood resilience. It was also evident that two communities have similar level of resilience. Similarly, both male and female-headed households have also similar level of resilience in these communities. Considering male and female respondent do not have any significant implication to the bonding and bridging social capitals and do not have negative impact to the flood resilience too. The factors contributing to difference in resilience level need to be studied in future.

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