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Social Capital and Forest Conservation: Do they have any relationship?

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Abstract

This research is explored to find out the relationship between social capital and forest conservation. From the research, it has been found that where social capital status is strong in society forest conservation is easier. To find out this result two sites were selected. Three villages from the Rangamati site and two villages from the Sitakunda site. Thirty households were surveyed from both sites by a structured questionnaire. The Main was given to the amount of forest resource extracted by the villagers, collective action in forest conservation, participation, groups and networks, trust and solidarity, social cohesion and inclusion among the people. Scores found in the study are 5 and 2.1 for trust in the Rangamati site and Sitakunda site respectively. It indicates a deep trust among the people in the Rangamati site and opposite in the Sitakunda site. In the question of willingly help 5 is scored in the Rangamati site and 2.3 on the Sitakunda site. It indicates that people of the Rangamati site are more helpful than the people of the Sitakunda site. In the case of participation for forest conservation, many of the people of the Rangamati site willingly take part in collective action (e.g. 47% of respondents work collectively in plantation) where Sitakunda people are less in amount (e.g. 40% in plantation). All other variables also show the differences in social capital status between the two sites where the Rangamati site scored more. In the case of extraction of forest products, Rangamati people are more aware than the people of the Sitakunda site. So, from the above discussion, it can be said that social capital is playing a central role in forest conservation.

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Introduction

Forest is considered large storage of natural resources. These natural resources not only fulfill the needs of people but also provide a substantial amount of revenue to the government if they can be managed properly (Hossain *et al.,* 2018; Hossen *et al.,* 2019). For as long as people have managed natural resources, they have engaged in the form of collective action. Collective actions are institutionalized in many forms of association, through clan or kin groups, traditional leadership; hunting, grazing, and fishing societies; women's self-help groups; youth religious groups; and labor exchange societies. The importance of local institutions has been understood in the common-property literature but has only recently come to be recognized as important for natural resource conservation and management (Ostrom, 1990; Stoll-Kleemann and O'Riordan, 2002; Hossen and Hossain, 2018; Hossain *et al.,* 2020). There is growing evidence from both the land and marine sectors to show that when people are well connected in groups and networks, and when their knowledge is sought, incorporated, and built upon during planning and implementation of conservation and development activities, then they are more likely to sustain stewardship and protection over the long term (Uphoff and Wijayaratna, 2000; Mamnun and Hossen, 2020; Hossen *et al.,* 2021). By this point, it can be realized that a well-connected local institution can maintain sustainable Forest Conservation. There is growing recognition of the effectiveness of such local groups and associations in bringing about positive outcomes, and the idea that social connectedness should be seen as an important capital asset in gaining strength (Pretty and Smith, 2004). This kind of capital is called Social Capital. Recent years have seen rapid growth in interest in the term in Social Capital. It captures the idea that social bonds and norms are important for sustainability (Pretty and Smith, 2004). Social capital as resources available to an individual through their network ties: It is rational actions that lead to the formation of social structure (Lin, 2001). The social capital concept has evolved as a framework for understanding the relationships among stakeholders by involving in community development and has come to the forefront as a crucial ingredient in achieving equitable and sustainable development (Abom, 2004). It has its roots in several theories, including those of social support and social networks, as well as community participation and governance (Grant, 2001). The flow of benefits from natural resources (i.e. Forest) can be conserved and more equitably distributed among participants through collective action (Jagger and Luckert, 2008). Collective action is possible by co-ordination and co-operation. Social capital can be defined as the features of social organizations that facilitate co-ordination and co-operation for the mutual benefit of the members and society as a whole (Putnam, 2001). These features include networks, reciprocity, norms and trust (Bowles and Gintis, 2002; Carroll, 2001; Uphoff and Wijayaratna, 2000) that encourage collective action to achieve more sustainable development (Woolcock, 2001).

Now it can be assumed that Social capital can be an effective concept for sustainable forest conservation. Because, as a participatory process, people have the confidence to invest in collective activities, knowing that others will also do so (Pretty and Smith, 2004). Connectedness among the people of a society is the basis of Social Capital. Three types of connectedness have been identified as important for the networks within, between and beyond communities (Woolcock, 2001). These are called bonding, bridging and linking types of social capital. Although the contribution of social capital to forest and nature conservation has been studied in many countries, very little is known in our country (Nath *et al.,* 2010). This study it was investigated the status and role of social capital on forest conservation by taking two community-based forest conservation projects as case study sites.

Materials and methods

Study area

Data for the study was gathered from two sites. The study sites are located in the Rangamati and Sitakunda-Mirsharai. Arannayk Foundation (AF) has been supporting community-based conservation of forests in the CHT and this study area is one of the six

sites. The partner organization is *Hill Flower*, an indigenous community-led NGO working closely in the area, which has been implementing a forest development and biodiversity conservation project named *"Community-based Conservation of Forest Resources and Enhancing Rural Livelihood in Rangamati of the Chittagong Hill Tracts"* funded by AF in 5 no. Wagga union of Kaptai Upazila in Rangamati Hill District for the period of June 2009 to May 2012. The total area of the project is 200 acres consisting of five villages namely Sapchari Moinpara, Sapchari para, Tripurachari, Hatimara and Tambapara and situated on the eastern side of Rangamati-Boroichari road. The project area is inhibited by Tonchongya and Marma tribes. As most of the areas in the project are hilly, so the inhabitants of the area have to depend on hills for their livelihoods.

Young Power in Social Action (YPSA) a local community-led NGO working closely in the area, is a partner organization of AF that has been implementing a forest restoration and biodiversity conservation project named *"Restoration and Conservation of Bio-diversity in the Denuded Hills in Sitakunda and Mirsharai, Chittagong"* funded by the AF in the Baraiyadhala Beat of Baraiyadhala Range and the Gobinia Beat of Mirsharai Range under Chittagong North Forest Division for the period of June 2009 to July 2012. The project covers 200 ha (494 acres) of denuded hills at the Baraiyadhala Beat (adjoining the Madhya Wahedpur village) of Baraiyadhala Range and another 200 ha (494 acres) of such land at the Gobinia Beat (along Mirsharai – Fatikchari Road) of the Mirsharai Range. The total forest area of Bariyadhala Beat is about 1020 ha (2520 acre) and total forest area of Gobinia Beat is 2753 ha (6800 acres). Bariyadhala beat consists of two forest blocks namely Bariyadhala block and Wahedpur block. Gobinia beat also consists of two forest blocks namely Gobinia block and Ragunathpur block. Administratively Baraiyadhala beat is composed of Baraiyadhala union under the Sitakunda Upazila and Wahedpur union under Mirsharai Upazila. On the other hand, Gobinia beat is composed of Mirsharai union of Mirsharai Upazila. A total of 15 villages have been selected as direct working areas for the project of which 5 villages of 2 no. Bariyadhala union and 4villages of 15 no. Wahedpur union is under Baraiyadhala beat, and 6 villages of 9 no. Mirsharai union is under Gobinia beat. There are 6548 families under 15 villages of this project area. The total population of the working area is 42734. A total of 496 household members from 492 families have been selected as project participants.

For study purposes, it was selected these projects because these were ongoing projects and project authorities intended to manage forests (as well as biodiversity) through the participation of local people.

Sampling for data collection

The Rangamati site has five project villages and Sitakunda site has four project villages. It was selected three (03) villages from the Rangamati site and two (02) from the Sitakunda site. Thirty (out of 75) and thirty (out of 72) households were selected randomly from Rangamati and Sitakunda sites respectively. It was considered social connections, groups and networks, level of trust, social cohesion and inclusion, collective activities and participation as proxies for assessing the state of social capital among the villagers. Household interviews and informal group discussions were undertaken in February 2012. An open-ended questionnaire was used for each household and the questions were related to the following aspects of social capital:

Groups and networks: number of organizations and members involved, number of people willing to and currently able to help by giving money;
Trust and solidarity: trust in village people, people of same ethnic group, people from other ethnic groups, village leader, leadership, level of trust in last five years;
Social cohesion and inclusion: the feeling of togetherness, social stratification;
Collective activities: collective activities they performed for forest conservation and social development;

Participation: level of villager's participation in project activities, decision-making processes.

One group discussion in each village was also held and additionally, staff members of the NGOs were also interviewed at all study sites. Six to eight villagers attended a group discussion in each village and they were asked to comment on relationships among villagers, neighbors and project officers, asked about the formation and roles of social organizations for forest conservation and social development, and their participation in project functions. They were also asked about collective activities that contribute to forest conservation and their livelihood improvement. Project officers commented on their linkages with villagers that help the continuation and achievements of project functions. Separate open-ended questions were used to facilitate the discussions.

Results and discussion

Status and contribution of social capital

The study reveals that people are connected to their daily life in rural societies. Some have personal relationships while others have organizational links. In analyzing the status of social capital, first, it looks at groups and networks followed by trust and solidarity, social cohesion and inclusion. These interrelated variables are illustrated in Table 1.

Table 1. Selected variables of social capital in the three villages.

Study villages variable	Tribal	Bengali	t-value	df	Sig-(2 tailed)
Groups and Networks					
Number of organizations involved	2	1			
Number of members involved	1	1			
Number of people willing to help by giving money in an emergency	4	5			
Number of people currently able to provide this money	4	6			
Trust and Solidarity					
Opinion on the statements[a]					
Most of the village people can be trusted	5	2.1	33.05	29	0.000
Most people are willing to help if needed	5	2.3	16.16	29	0.000
Trust of the villagers[a]					
From the same ethnic group	4.53	2.8	9.67	29	0.000
People from other ethnic group	4.9	2.87	13.77	29	0.000
Village leader	3.13	1.3	11.49	29	0.000
Leader responsiveness	3.1	1	19.40	29	0.000
Level of trust in last five years[b]					
Going to be better	100	50			
Getting worse	-	30			
Stayed at the same	-	20			
Social Cohesion and Inclusion[b]					
Feeling of togetherness or closeness					
Somewhat distant	-	-			
Neither distant nor close	-	13.33			
Somewhat close	13.33	20			
Very close	86.67	66.67			
Social stratification					
Neither great nor small extent	-	-			
Small extent	13.33	23.33			
Very small extent	86.67	76.67			

[Note: a = Figures are the averages of five scales used; (1 = to a very small extent, 2 = to a small scale, 3 = neither small nor great extent, 4 = to a great extent, 5 = to a very great extent); b = Figures indicate percentages of household.]

Groups and networks

Formal and informal organizations relevant to social development intervention may exist in a village. In each studied village, apart from traditional social associations, there were some formal organizations including NGOs that carry out forest conservation and social development work. All sampled households in the three villages of the Rangamati site were engaged with at least two organizations and at least one person (1 in Sitakunda site) per household was actively involved with these organizations (Table 1). Across two areas the average values of the number of

people willing to help by giving money in an emergency were 4.3 (Rangamati site), 4.5 (Sitakunda site), respectively (Table 1). These values indicate that these villagers have a satisfactory connection with people, which is consistent with the later one variable of groups and networks i.e. four in Rangamati site and six in Sitakunda site (Table 5). This connectivity enabled villagers to achieve livelihood benefits. They had known about the NGOs by the neighbors in time and included themselves in the NGO activities and got various livelihood supports from them. They got seeds, seedlings, insecticides and financial support from the NGOs to improve their livelihood. Moreover, they have come to know about various impacts of deforestation e.g. less rainfall, climate change, the fertility of the agricultural land is decreasing, environmental pollution, etc. from each other by the group discussions. The participants are giving the knowledge to the non-participants. Thus public awareness is increased in the two study sites by the strong network among the people which is the initial demand for community-based forest conservation.

Table 2. Respondents' perception (% households) about lost species in the Rangamati site.

Sl. No.	Species (Local name)	Scientific Name	Household (%)
1	Achar Gula	*Grewia microcos*	35
2	Bohera	*Terminalia belerica*	14
3	Barta	*Artocarpus lacucha*	49
4	Cane Tree	Unknown	13
5	Chalta	*Dillenia indica*	5
6	Chorai Tree	*Piper chaba*	65
7	Chundul	*Tetramelis nudiflora*	19
8	Civit	*Swintonia floribunda*	57
9	Dumur	*Ficus semicordata*	17
10	Dup tree	*Canarium resinifeium*	49
11	Garjan	*Dipterocarpus turbinatus*	46
12	Gila Lata	*Derris trifoliate*	12
13	Goda	*Vitex peduncularia*	9
14	Gutgutiya	*Bursera serrate*	13
15	Jaganna Gula	*Ficus nervosa*	68
16	Kau Gula	*Garcinia cowa*	30
17	Ko Ful	Unknown	8
18	Kusum	*Schleichera olosa*	22
19	Medha	*Trewia policarpa*	12
20	Tali Tree	*Dichopis polyantha*	19
21	Tulshi	*Ocimum sancitum*	16

Trust and solidarity, and social cohesion and inclusion

Due to indigenous composition, the length of time living together and developed personal relationships, there were different levels of trust across the Rangamati site (Table 1). Being homogeneous in indigenous composition and living together for more than 50 years in the same village, the level of trust (4.53 and 4.9) among tribal people were stronger than the Sitakunda site (2.8 and 2.87 respectively). So it is clear that there are significant differences ($t=33.05$; $P<0.000$) in trust between the two study areas. The reasons for such variation were that most of the villagers in the Rangamati site have family relationships and the majority of tribal (mainly Thongchongya) people have a good understanding of

the Bengali and others (mainly Marma and Chakma) people though they have a different culture. On the other hand, in Sitakunda site dominant Bengali villagers have a conflicting culture i.e. quarrel with each other, conflict in land ownership, conflict in the collection of forest products, different offenses done by the villagers such as robbery resulting in a low-level of trust in each other. Turner and Nguyen (2005) reported that trust occurs among a relatively narrow circle of family and close friends, whilst there is considerable distrust in outsiders.

The level of trust affects social cohesion and inclusion. The majority of the villagers (86.67%) in tribal villages reported having very close feelings of togetherness among them while 66.67% of villagers of Bengali's villages have a very close relationship among them (Table 1). Where villagers (13.33%) of the Bengali villages have neither distant nor close relations, villagers of tribal's villages (0%) have no distant relationship. But no one has somewhat distant feelings of togetherness.

Participation

According to the project proposal at the Rangamati site, the villagers were supposed to participate in project implementation activities. To increase the sense of ownership among villagers, it is desirable to involve representatives of the project village committee in project meetings and decision-making processes. This ownership would encourage them to manage and protect the project resources for their interests. This would also increase the level of transparency in project activities. Researchers (e.g. Pini and McKenzie, 2006) have argued that the sustainability of natural resource management is dependent upon effective participation of the community to create feelings of ownership. Direct community participation in decision-making and management would strengthen and enable the pursuit of environmental conservation objectives (Mendez-Contreras *et al.,* 2008).

Villagers of the Sitakunda site participate in forest management only as unpaid laborers. In accordance with need, NGO staffs call the village leader to discuss the schedules of activities (e.g. weeding, planting, and patrolling) and decide how many people they need for labor. The Forest Department (FD) doesn't invite the leader to attend meetings. Thus he can't play an active role in decisions made at meetings. FD never collaborates with the NGO and the local people in the Sitakunda site in a participatory approach for biodiversity conservation. They always break their commitment which they give at the meeting of NGO and local people. For example, FD always encouraged people not to fire in the forest for weeding. People obeyed their instruction and stopped firing in the forest. For this, they had to expend more money for weeding in the forest. But one day some FD staff created forest fire in that forest which was rising richly with a huge amount of plant and wildlife composition. By firing in the forest, all living and dead resources were destroyed in Sitakunda. The fire broke out all over the forest which burnt about 5 miles of hill forest and also burnt the plants planted by the local peoples on the hill. This irresponsibility of FD caused a great loss to the local people. Thus FD breaks their commitment to the people and harms the participatory approach of forest conservation. Furthermore, FD staff are losing the faith of the local people which points out the less strength of the linking social capital in the Sitakunda site.

Collective activities

It was found evidence of collective action both in the two study areas. On average, all worked collectively for many days in a year. In the Tribal's Villages, about 46.15% of respondents work collectively in plantations, 26.92% in weeding and 26.92% in patrolling the forest. There is a person who was awarded for plantation and weeding in the forest namely Merkuya Tanchongya who not merely weeds his land but also the land of other local people. This activity shows the strength of the collective action of the Rangamati site in participatory-based forest conservation. The Sitakunda site may not be as strong as the tribal's but has a good commitment to improving the collective action among them in biodiversity conservation. 39.19% respondent works

collectively in plantation, 25.32% in weeding and 21.23% in patrolling in the forest.

Role of Social capital on forest conservation

From the above discussion, it is clear that social capital in the two study sites is playing a central role in forest conservation. Public awareness is increasing which is apparent in the Rangamati site by the strong social network among the people. On the other hand, a significant difference is noticeable in the question of trust and solidarity between two study sites where the Sitakunda site is found poorer. For this they are also backward in the collective action and participation in the community-based forest conservation than the people of the Rangamati site. Consumption of forest products is also more in the Sitakunda site which is occurring for nothing but lack of awareness. Plant diversity of the two sites can be compared to know about the past and present situation of the forest.

The felling of endangered native trees and the Incidence of trapping/hunting of wild animals has been reduced in the project area. An account of lost species in the Rangamati site is given in Table 2.

Table 3. Respondents' perception (%Household) about lost species in the study area of Bengali's Villages.

Sl. No.	Species (Local name)	Scientific name	Household (%)
1	Achar Gula	*Grewia microcos*	31
2	Bohera	*Terminalia bellerica*	47
3	Chapalish	*Artocarpus chaplasha*	36
4	Civit	*Swintonia floribunda*	39
5	Dharmara	*Stereospermum personatum*	67
6	Dumur	*Ficus semicordata*	37
7	Garjan	*Dipterocarpus turbinatus*	69
8	Gilalata	*Derris trifoliata*	22
9	Goda	*Vitex glabrata*	31
10	Gutgutiya	*Protium serratum*	56
11	Haritaki	*Terminalia chebula*	51
12	Jarul	*Lagerstroemia speciosa*	39
13	Latkon	*Baccaura ramiflora*	33
14	Pitraj	*Aphanamixis polystachya*	22
15	Telsur	*Hopea odorata*	15
16	Tula	*Bombax ceiba*	9

The homestead survey tried to find out the species that are lost from the homesteads and hilly regions of the study area. The respondent households were asked to identify the names (s) of the lost species from their homesteads and hilly lands. It is found that a total of 21 species were identified by the respondents that were lost from the locality. Among the lost species Jaganna Gula (68%), Chorai tree (65%), Civit (57%), Barta (49%), Dup tree (49%) and Garjan (46%) are the most answered plant species that are lost from the study area (Table 2). At present, a total of 38 different species were found in the homesteads and hills of the study area. Usually, the community people are more dependent on crops and tree products that are grown in and around the homesteads and hilly areas occupied or owned by them. Among plant diversity different timber, fruit and medicinal species are found growing.

This assessment shows that about 21 indigenous species had been lost from the study area of Tribal's and the exotic species (i.e. Gamar, Segun) and fruit species (i.e. Am, Banana) have taken the place. It is increasing due to the more information transfer among the tribal people about the more profit of the exotic species which indicate the negative effect of the strong social capital in the Rangamati site. But at present lost indigenous species are also planting beside the exotics. Kanjol, Boilam, Bansh pata, Hijol, Arjun, Garjan, Gutgutiya, Chalta, Civit, etc. are planted by the people with the help of NGOs. They are interested to plant those people with other timber and

fruit species because of increased awareness. For example, they planted gutgutiya just beside the creek to prevent the land from sliding and to get pure drinking water from the creek. Thus social inclusion, cohesion and trust inspiring the people of the Rangamati site in community-based forest conservation.

On the other hand, in the Sitakunda site, it is found that a total of 16 tree species were identified by the respondents of the study area that were lost from the locality. Among the lost species Garjan (69%), Gutgutiya (56%), Bohera (47%), Dharmara (67%) and Haritaki (51%) are the most answered plant species that are lost from the study area (Table 3).

This assessment shows that about 16 indigenous species had been lost from the study area of Bengali's and the exotic species (i.e. Gamar, Eucalyptus) and fruit species (i.e. Am, Banana) have taken the place. It is increasing due to the more information transfer among the Bengali people about the more profit of the exotic and fruit species which indicate the negative effect of the social capital in the Bengali's Villages. Nowadays Gutgutiya, Daharmara, Arjun, Horitaki, Bohera, Jarul, Latkon, etc. species are planted by the people with the help of NGOs. People are interested to plant the lost indigenous species besides the other exotic ones for medicinal purposes and also for biodiversity conservation. It's become a success only for the mounting of social capital among the people.

Problems identified by participants

Community-based forest conservation approach is considered the most promising approach. People are also being interested in it with the increase of awareness in both study sites. It is proved when 100% of villagers of both sites (Rangamati and Sitakunda) answered that forest conservation is needed. Though they are agreed to take part in collective action in participatory forestry they have to face different problems to implement it. In the Rangamati site, the main problem is jhum cultivation. Some unaware people cultivating on the hill and burning the plants and seedlings indiscriminately. It is affecting the whole process of forest conservation. Another main crisis in the Rangamati site is the brickfield. Fuelwood needed for those brickfields is being collected from the forest. That's why the forest conservation process is being debilitated. The land tenure system is another most affecting factor that is preventing the advancement of the conservation process. It is an old and unsolved political issue. When participants want to plant on any fellow land other people try to attack to kill them. They think that it is a Government policy to remove them from the hill. These are the main problems faced by the participants of the Rangamati site. Others are mainly illegal cutting, land sliding, over-collection of fuelwood, etc. In the Sitakunda site, the main problem is firing on the hill for weeding. Sometimes FD also fires on the hill. Participants try to enrich the forest resource but they have to suffer for the firing. Another main difficulty is illegal cutting which is generally done by the local political leaders. They always give threats to the participants not to patrol in the forest. Sometimes their laborers attack participants to kill and many times injure them. Other minor problems are illegal and over the collection of bamboo, collection of fuelwood, grazing, etc. faced by the participants of Sitakunda site.

Conclusion

The finding of this study is Social network, trust and Solidarity among the people, Social cohesion, togetherness and inclusion have a crucial role in community-based forest conservation. It is seen that in the Rangamati site where social bonding is so strong in the society putting a great contribution in information transfer and increment of awareness. The people of the Rangamati site acting collectively for the improvement of their livelihood as well as the forest resource. The collection of forest resources is also controlled in the Rangamati site which is increasing day by day. With the help of NGOs people are trying to restore their forest resources. For a strong network, they have come to know about the benefit and profits of forest conservation. Alternatively in the Sitakunda site status of social cohesion is opposite of the

Rangamati site. Trust and solidarity level is very poor which creates conflicts among the people of Sitakunda site. This form of social capital is affecting biodiversity conservation as well as forest resources conservation in the Sitakunda site. Collective action for forest conservation is poorer in the Sitakunda site. For this, they are not aware of the collection of forest products. They are extracting more than they consume. It indicates the poor knowledge about the benefit and profit of forest conservation which is happening because of the lower social network among the people of the Sitakunda site. They have less trust in the FD and local leaders which indicates the lower status of solidarity than the Rangamati site. From the above discussion, it is clear that the Rangamati site is much forward in community-based forest conservation where the Sitakunda site is less. It becomes possible because of the strong social capital in the Rangamati site. So, it can be said that where social capital is strong forest conservation is easier and vice versa.

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