

Assessment of Social Capital in Two Rural Communities through Application of a Network Based Measurement

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Abstract

The paper presents the results of social capital measurement in two rural Bangladeshi communities by using a network based measurement technique. The study was conducted in Purbadhala upazila under Netrokona district among the members of two neighbouring communities – a fishing community involved in community based fisheries management (CBFM) and a farming community having no such involvement. Social capital was measured in its three elements such as trusts, norms and network size across three network structures of the society, namely informal, generalized and institutional. Four informal, six generalized and six institutional elements of relations were used to measure social capital of the concerned communities. A 5-point Likert scale was used for the measurement of trust and norms of the respondents, while network size was measured by counting relations in the three network realms. Data were collected from 279 respondents through face to face interview by using a structured questionnaire in March 2007. The members of the fishing community possessed higher levels of social capital than the members of the farming community in terms of social trust, norms of reciprocity and network size across the three network relations. The respondents were categorized into four types through cluster analysis. The typologies obtained by the cluster analysis also showed that members of the fishing community possessed higher levels of social capital than the members of the farming community although the latter were in better positions in terms of a number of socio-economic variables.

Keywords: *Social capital, social trust, norms of reciprocity, networks*

Introduction

Social capital can be understood as networks of social relations characterized by norms of trust and reciprocity that can facilitate outcomes as varying social scales, from program and practice levels to the level of communities and nation states (Stone and Hughes, 2002). Despite social capital has gained increasing popularity in social, economic and political spheres since the

1990s, it is an empirically elusive concept and still little is known about social capital in practice, particularly as it features in different types of groups and communities. Measurement of social capital ranged from a single to a wide number of items related to its different dimensions. Of late, Stone and Hughes (2002) developed a network based measurement within the conceptual

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framework of a research project undertaken by the Australian Institute of Family Studies. That study comprehensively showed how the social capital measurement issues can be addressed for its understanding in different networks relations. The present paper tries to demonstrate the results of a network based social capital measurement study conducted in a selected location in Bangladesh.

The measurement of social capital is based on the framework used by Stone and Hughes. The framework conceptualizes social capital as a multidimensional concept comprising networks, trust and reciprocity. Key measures of social capital included norms of trust and reciprocity in the informal, generalized and

institutional relations. Networks within the realms of established and closed relationships are referred to here as “informal networks,” while “generalized networks” concern the extent to which trust and reciprocity are extended to people, often on the basis of expectations of behaviour. The “institutional networks” referred to the peoples’ relationships with formal institutions of governance and markets. The specific objectives of the study are: (i) to assess social capital in some rural communities in Bangladesh by using the network based measurement as developed by Stone and Hughes (2002) and (ii) to categorize the rural people on the basis of their social capital score.

Methodology

Study location and background information

This study was conducted in two rural communities in a central district of Bangladesh. The primary objective of the study was to compare the levels of social capital between a fishing community and a farming community in Purbadhala *Upazila* of Netrokona district. The fishing community members were living around closely located four natural water bodies (Rajdhola beel, Kalinadi, Panishana, and Padmai), while the farming community was a neighbouring community living in Kaldoar village located nearly Rajdhola beel. Although the members of these two communities used to live in same socio-cultural circumstances, the major difference between them was that the fishing community had been involved in community based fisheries management (CBFM) since 1996. Under the CBFM, the fishing community members had been trying to manage their fisheries resources through a

community based organization (CBO) under the supervision of Caritas, a national non-government organization (NGO). It was assumed that the nature of CBFM activities was favourable for increasing social networks, trust and a set of social norms among the fishing community members. On the other hand, the neighbouring farming community members had no orientation to such organizational activities.

Population and sample of the study

The population of the study was 127 and 305 members respectively of the fishing and farming communities. All fishers from the fishing community (i.e., 127) were included in the sample (population-sample), while 50% farm household-heads (i.e., 152) were randomly selected from the farming community.

Instrument and method of data collection

A pre-designed questionnaire (personal

interview schedule) was used to elicit required data from the selected sample of the study. Data were collected in March 2007 by a group of enumerators through face to face interview with the respondents. The data collection team consisted of five enumerators, who were the post-graduate (M.S) students of the Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Measurement of social capital by network approach

In the present study social capital was measured in three major elements (social trust, social norms and networks) across three network structures (informal, generalized and institutional relations). In order to determine the level of social capital of a community, trust and norms of reciprocity were measured within the realms of informal and generalized relations, while only trust (or confidence) was measured within the elements of institutional relations. Moreover, sizes of one's networks in these three relational realms were also determined. The elements of informal network included family, close relatives, friends and close neighbours, while the elements of generalized network included workmates (fellow fishers or farmers), local people, people in general, field workers from NGOs, extension agents, and religious and opinion leaders. The six institutional network elements considered for the study were legal and judiciary systems, police, local

government, politicians (political parties), government offices, and NGOs. For measuring trust or norms, questions were developed for all the 16 elements in a five-point scale with responses ranging from 1 ('insignificant' or 'not at all') to 5 ('completely'). On the other hand, network size in informal realm was assessed by one's number regular contacts with family members, close relatives, close friends and close neighbours. The network size in generalized realm was measured by one's number of regular social contacts through different formal groups and organizations he/she participated, while number of institutional ties was understood by one's regular contact with different formal institutions and organizations stated earlier.

Reliability of the scale and formation of overall measure

Before interviewing, a pre-test was conducted with 20 respondents and data were used to compute the reliability of the instrument. A Cronbach's Alpha reliability coefficient of 0.87, 0.91 and 0.82 were obtained respectively for the measures of trust in 'informal network elements,' 'generalized network elements,' and 'institutional network elements.' Similarly, a Cronbach's Alpha of 0.76 and 0.88 were obtained respectively for the measures of reciprocity in 'informal network elements' and 'generalized network elements.'

Findings and Discussion

Some important characteristics of the community members

In order to have a general idea about the communities under investigation, ten selected

characteristics were studied. The salient features of the characteristics of the respondents from the both communities have been in the Table 1.

Table 1. Some selected characteristics of the members of the two communities

Respondent characteristics (measuring units/methods)	Observed range	Mean	
		Fishing (n = 127)	Farming (n = 152)
Age (year)	16-71	39.33	42.77
Local orientation (years)	9-61	31.22	38.54
Family size (numbers)	2-12	5.50	4.79
Personal education (grade)	0-14	2.80	3.85
Homestead farm area (ha)	0-0.64	.065	.076
Farm size (ha)	0-2.83	.12*	.28
Annual income ('000' Tk)	36.2-187.6	59.33	88.98
Organizational participation (score)	0-113	41.82	8.22
Cosmopoliteness (0-18)	4-17	6.43	8.71
Contact to interpersonal communication media (0-36)	5-28	19.32	13.90
Mass media contact (0-15)	3-12	6.11	9.87

*including seasonal farm areas which are usually inundated in a part of the year

Data presented in the Table 1 is self explanatory in nature. It is to be noted that the members of the farming community were in better economic condition as indicated by their farm size and annual income. Conditions regarding other characteristics such as education, cosmopoliteness and exposure to mass media may also be attributed to their better economic condition. The fishing community members' higher score in organizational participation and contact to

interpersonal media are due to their involvement in CBFM and CBO activities.

Measurement of social capital elements

Social trust across network levels

The overall social trust score of a respondent was measured by adding her/his obtained scores in the elements under a specific social relation. The obtained social trust scores of the respondents have been presented in the Table 2.

Table 2. Average social trust scores of the respondents in three network relations

Network relations	Possible score range	Average trust scores with standard deviation ¹		t-value
		Fishing community (n = 127)	Farming community (n = 152)	
Informal	4 - 20	17.54 (2.077)	16.95 (2.491)	2.092*
Generalized	6 - 30	22.65 (2.899)	20.59 (3.537)	5.253***
Institutionalized	6 - 30	18.73 (3.272)	16.77 (3.940)	4.435***

¹Figures in the parentheses indicate concerned standard deviations.

* and *** Significant at 0.05 and 0.001 levels of probability, respectively

The table clearly shows that the level of trust and confidence among the members of the fishing community was higher than those of the farming community. This is might be due

to the fact that long term involvement of the fishing community with CBFM and CBO brought them together in livelihoods activities what results in increased mutual trust and

confidence. The average trust scores were, however, good in both communities under observation. Studies of Kanak *et al.* (2006) and Rahman and Yamao (2007) also reported prevalence of higher trust in the rural communities.

Norms of reciprocity

Norms of reciprocity in the elements of social

relations was measured in two network levels: informal relations and generalised relations. As there is no support of measuring any reciprocity between individuals and the institutional elements, the researchers avoided the institutional realms of network in measuring reciprocity. Results concerning levels of reciprocity among the members of the two communities are presented in Table 3.

Table 3. Average social norm scores of the respondents in three network structures

Network structures	Possible score range	Average norms scores with standard deviation [†]		t-value
		Fishing community (n = 127)	Farming community (n = 152)	
Informal	4 - 20	17.18 (2.345)	16.61 (2.793)	1.822
Generalized	6 – 30	21.89 (2.920)	19.74 (3.835)	5.176***

[†]Figures in the parentheses indicate concerned standard deviation.

***Significant at 0.001 level of probability

Data presented in the Table 3 reveal that, although the members of fishing community possessed higher social capital than the members of the farming community in terms of norms of reciprocity across the informal and generalized relations, the difference of means in case of informal relations was not statistically significant. The same observation was reported in the studies of Kanak *et al.* (2006) and Rahman and Yamao (2007), where it was argued that development interventions were unlikely to change the norms related behaviour of rural people, who by tradition were strongly bounded with each other. Moreover, reciprocity with the elements of informal relations was very high while the same was not so high in the cases of generalized elements.

Network size

Actually network is sometimes considered as the most important element of social capital (Putnam, 1995; Woolcock, 2001). While,

across the studies, network is usually measured by affiliations with social organizations, in the present study the emphasis was given in the elements of different network relations. The measurement was done by a simple way, just by counting the number of regular or close contacts with the members of different elements. Network sizes of the respondents in the three relations have been presented in the Table 4.

The table clearly shows that in all three cases the fishing community members had higher number of ties than that of the members of the farming community. Particularly important is the number of group membership where the difference was too large. The difference attributed to the fishermen's involvement in CBFM and regular interaction with other local organizations. On the other hand, there was no such community based organization in the farming village.

Table 4. Number of ties of the respondents in different network relations

Network structures	Average network size with standard deviation ¹		t-value
	Fishing community (n = 127)	Farming community (n = 152)	
Number of informal ties	61.24 (34.020)	47.11 (29.656)	3.706***
Number of group membership	52.02 (19.959)	6.55 (12.884)	22.947***
Number of institutional ties	4.75 (1.976)	3.81 (1.921)	4.012***

¹Figures in the parentheses indicate concerned standard deviations.

***Significant at 0.001 level of probability

Overall measure of social capital and categorization of individuals

The study examines the possibility of whether all the different elements of social capital can be summarized adequately in one scale or measure. Two methods aimed at grouping all social capital measures together to provide an 'overall' social capital measure were developed and tested. The rationale for constructing a single measure of social capital is the need for practical, simple measures which allow us to talk about the 'total' stock of social capital available to an individual or community.

A single index approach

The first method was variable based. It examined how all the various elements of

social capital within different network types operate together, and whether they can form a reliable and meaningful overall index of social capital. In order to facilitate simplification of the procedure, the trust and norms scores of the respondents were summarized together, because these were measured in same scale. Following a series of factor analyses and reliability tests, it was concluded that rather than forming a single index of social capital, the underlying structure of the data was such that (in general) factors of particular dimensions were found that cross-cut social realms. The result of factor analysis has been presented in Tables 5a and 5b.

Table 5a. Results of factor analysis: total variance explained

Components	Initial Eigenvalues			Extraction Sums of Square Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.474	41.235	41.235	2.474	41.235	41.235
2	1.082	18.033	59.268	1.082	18.033	59.268
3	.911	15.184	74.453			
4	.739	12.322	86.775			
5	.517	8.615	95.390			
6	.277	4.610	100.000			

Note: KMO measure for sampling adequacy: 0.657, Extraction method: Principal Component Analysis

Table 5b. Results of factor analysis: rotated component matrix^a

	Component	
	1	2
Generalized trust and reciprocity	0.867	
Institutional trust	0.846	
Informal trust and reciprocity	0.732	
Number of institutional ties		0.771
Number of group membership		0.705
Number of informal ties		0.571

Extraction method: Principal Component Analysis

Rotation method: Varimax with Kaiser Normalization

a. Rotation converged in 3 iterations

Following factor analysis and reliability tests, it was concluded that items about trust and reciprocity cohered together in one factor, while items measuring network size grouped together to form an overall scale of network size. Therefore, instead of a single index, social capital was described in two separate indices. Again, a Cronbach's Alpha reliability coefficient of .83 and .72 were obtained respectively for the composite scales of norms (of trust and reciprocity) and network size. That means, summarizing all scores for form an 'overall' measure of social capital will not be logical.

A typology approach

An alternative approach was to use cluster analysis, which groups cases, or respondents, rather than variables. The method attempts to identify particular sub-groups of respondents in the sample with a distinctive social capital profile. The advantage of this approach is that it is possible to produce a single measure of social capital but one that also highlights the multidimensional nature of the concept. This approach is driven by the expectation that it will be possible to find out clusters of people with different network characteristics and whose levels of trust and reciprocity will vary by network type. Hierarchical cluster analysis was conducted maintaining Squared Euclidian Distance (as measures of similarity), while within group average method was followed in cluster formation. Using this technique it was possible to identify several key social capital 'types', summarized at Table 6. However, concerned dandograms and variable characteristics for cluster typology have not been presented in this paper mainly due to space limitation. On the basis of cluster typology, the respondents were classified into four categories as presented in Table 7.

Table 6. Social capital typology based on individual measures of social capital within network structures

Clusters	Four cluster typology	Generalized name
Cluster 1	Strong norms, high trust, strong networks	Social capital rich
Cluster 2	Strong norms, moderate trust, strong networks	Social capital moderate
Cluster 3	Moderate norms, moderate trust, moderate networks	Social capital limited
Cluster 4	Weaker norms, moderate trust, low networks	Social capital poor

The Table 7 shows that while some respondents (15.7% and 9.9% in fishing community and farming community, respectively) had extensive connections and high levels of trust and reciprocity across the network relations (the 'social capital rich') and only few (less than 1% in both communities) had few connections and low levels of trust and

reciprocity ('social capital poor'), majority of the respondents from the both communities lie between the categories of 'social capital moderate' and 'social capital limited'. The Table reveals that overall social capital stocks within the members of fishing community members were better than that of the members of the comparing farming community.

Table 7. Categories of respondents on the basis of social capital typology

Categories	Number and percentage ¹ of respondents	
	Fishing community (n=127)	Farming community (n=152)
Social capital rich	20 (15.7)	15 (9.9)
Social capital moderate	60 (47.2)	60 (39.5)
Social capital limited	46 (36.2)	76 (50.0)
Social capital poor	1 (0.8)	1 (0.7)

¹Figures in the parentheses indicate percentage of the total

Conclusions

‘Social capital’ is a relatively new concept in Bangladesh and its application in agriculture and social sciences is not widely practiced so far. The present study tries to fill the gap on measurement issue of social capital in the context of Bangladesh. It is concluded that the network based measurement technique can be well applicable in measuring social capital in Bangladeshi rural communities. The major finding is that social capital in the community involved in community based resource management was higher than the community did not have such activity. The poorer

community with increased stock of social capital was able to facilitate its capacity in sustainable resource management and utilization. At the same time, due to its multidimensionality in measurement, it is not logical to compute a composite score of social capital using its measuring elements. That’s why the researcher had to resort to more complex cluster analysis in order to look at the individual stock of social capital and community members’ categorization on the basis of it.

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References

- Kanak, S., Y. Morooka, and Y. Iiguni. 2006. Role of Microfinance in Building Trust as a Social Capital in Rural Bangladesh. *Paper Presented in the Annual Conference of the Association for Regional Agricultural and Forestry Economics*, St. Andrew University, Osaka, October 27-29.
- Rahman, M.H. and M. Yamao. 2007. Community-based Organic Farming and Social Capital in Different Network Structures: Studies in Two Farming Communities in Bangladesh. *American Journal of Agricultural and Biological Science*, 2(2): 62-68.
- Stone, W., and J. Hughes. 2002. Social Capital: Empirical Meaning and Measurement Validity. *Research Paper No. 27*, Australian Institute of Family Studies, Melbourne.