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Strengthening economic security through social capital: household's adaptation to cyclone risk in Bangladesh

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Abstract
The coastal area of Bangladesh faces destructive impacts of natural hazards mainly cyclones almost every year. Cyclone induced damages and losses are slow down the growing process of socio-economic developments in Bangladesh. The coastal households have their own adaptive mechanisms to cope with cyclones. This research has been undertaken to strengthen economic security through social capital for building household's adaptation to cyclone risk by developing a social capital-based framework at Hazipur village of Kalapara upazila and Lebukhali village of Dumki upazila under Patuakhali district in Bangladesh. Social capital is an imperative part of household assets in sustainable livelihood. The study focuses to find out the prevailing adaptation mechanisms and social capital of the households to reduce socio-economic risks due to natural disasters. It was done by mainly questionnaire survey and focus group discussion (FGD). During questionnaire survey, mainly the household's head was interrogated. Household's social and economic adaptation mechanisms were assessed to measure their existing adaptive mechanisms to cyclone risks. Most of the people in the study area depend on relief and external assistance from government and charitable organizations (51.6%), loan from micro-credit financing NGOs and banks (31.7%) and borrowed money from relatives and community elders (16.7%) for their economic adaptation to cyclone risks. Social capital information of the households was also assessed by various parameters to obtain their economic security. It was also found from the study that the coastal communities have limited network access to government and non-government official or outside institutions. But the households have great bonding based social kinship with their relatives. They also have moderate to well breezing relationship with their community people, local leaders, religious leaders, community elders with strong level of trust which help them to strengthen home economic security as well as develop their adaptive mechanisms to reduce economic risks. A framework has been developed at the end of the study to measure the contribution of social capital to strengthen economic security of the coastal people for their adaption with cyclones.

Keywords: adaptation, cyclone risk, economic security, social capital

1. Introduction

Climate change impact has unequivocal influence on the increased intensity and frequency of natural disasters and extreme weather events throughout the world (Srinivas and Nakagawa, 2008; Smith et al., 2009) [15, 14]. Consequently, the causalities from these natural disaster and extreme weather events also increased dramatically over the past decade. Other than casualties all these extreme weather events and disasters impede the typical socio-economic and technological advancement and increased people's vulnerabilities especially in the developing countries (Mirza, 2003) [13]. Adaptation to climate change did not receive much attention initially of the international climate change studies, where there was more focus on mitigation and impacts but adaptation has recently been covered more extensively due to the increasing vulnerability of some countries (Kates, 2000) [10]. The effects of climate change pose risks for agriculture, food and water supplies as well as economic security to the community people. The coastal region of Bangladesh south is prone to catastrophic cyclones, storm surge and other hazards with multiple vulnerabilities and risks due to climate change and its effects. These natural hazards increase the vulnerability of the coastal residents and slow down the process of social and economic developments (Ali, 1999).

Over recent years interest in the positive consequences of social capital on economic development has grown. Social capital is increasingly used in the field of community development and the social economy. Having social capital has been shown to be useful for strengthening economic security towards community people. Social capital is an essential component of economic transactions and cooperative action on adaptation practice in the context of different vulnerabilities associated with risks (Kelly and Adger, 2000; Adger, 2003) [11, 2]. It is a key factor of human adaptive capacity in networking with natural capital that copes with the disaster risks for their well-being (Adger, 2003). McLeod (2001) [12] summarize the household assets (e.g. natural capital, physical capital, human capital, social capital and financial capital) in sustainable livelihood theory. In the sustainable livelihood theory social capital asset have a key responsibility for building adaptation to

risks. Social capital provides an important role in social support and networks to recover cyclone risk towards adaptation that has very important role in improvement of economic condition of coastal households with their basic needs to strengthen their smart economy (Engerer, 2009; ILO, 2012; Aßheuer et al., 2013; Ahamed, 2013) [6, 1]. Adger (2003) summarized that adaptation is an active social practice which is steadily more controlled based on trust, reputation, and reciprocal action to have public and private essentials.

Strengthening economic security through social capital is a new scientific art to adapt with cyclone risk in southern Bangladesh. Economic security comes from the seven parts of human security concept: economic security, food security, health security, environmental security, personal security, community security and political security which directly deals with economic sustainability and freedoms from vulnerability, fear, want and shame (UNDP, 1994; Alkire 2003; Tavanti, 2013) [17]. The main apparatus of economic security in social practice are income, assets, work, employment, job, representation, pension and savings, labor market, remittance, reproduction of skilled manpower and so on. In today's economy, it is becoming very difficult for individuals, especially those from low-income households in Bangladesh to improve their economic status (Foroohar, 2011) [7]. However, researchers have found that one of the strongest predictors of upward mobility in lower-income populations were correlates of social capital and family structure.

This study emphasis on coastal households (that are mostly vulnerable to cyclone related risks) and their ability to adapt with cyclone risk. This research also identifies the existing social capital of the households. A framework is also developed to measure how to improve the economic security through social capital for greater adaptation to cyclone risk. According to the assessment report by UNDP (2013) [17] a cyclonic storm could destroy about one million tons of rice production since the same amount of rice has been destroyed in the case of Cyclone Sidr in 2007. During 1970 to 2009, about 3.4 million hectares of land had been damaged fully and 8.4 million hectares of land had been damaged partially (UNDP, 2013) [18]. Therefore, it is urgent to explore possible strategies towards making an economic resilient environment for households in coastal Bangladesh.

Research objectives

This research has two foremost objectives. First objective is to identify the prevailing household's adaptation mechanisms and social capital of the households. The second objective is to develop a social capital-based framework for strengthening economic at the household level to adaptation with cyclone risks.

Study area

Two study areas were selected for conducting this research work. Nilganj union of Kalapara upazila and Lebukhali union of Dumki upazila were the selected study area (figure 1). This area is very much vulnerable for natural disaster mainly for cyclone and storm-surge.

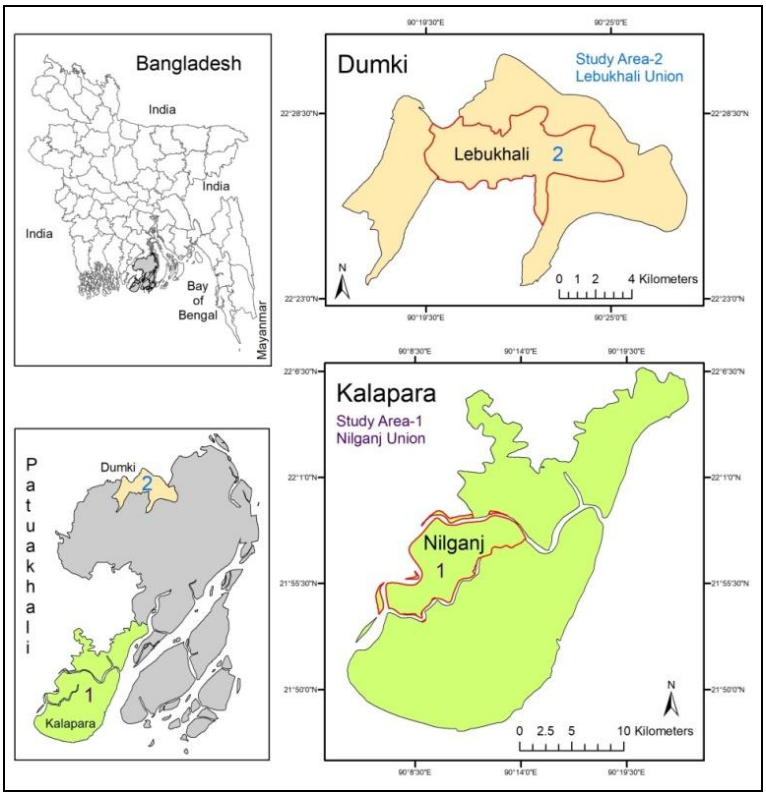

Fig 1: Study areas map (1. Nilganj union of Kalapara upazila and 2. Lebukhali union of Dumki upazila

2. Materials and Methods

This study was done through empirical quantitative techniques. Data was collected from both primary and secondary sources. Primary data was collected from standardized questionnaire survey, semi-structured interview with key informants and focus group discussion. An extensive survey was carried out at the household and institutional level to collect primary data from cyclone affected households through face-to-face interviews by using a consistent questionnaire to learn about the economic

risks of households before disaster, their strategy immediately after the disaster and their social capital for survival and adaptation. A field observation was done before questionnaire survey time with analytical and scientific mind to understand the general condition and practical situation of the study area. A total one hundred twenty household questionnaire surveys were collected randomly from the two villages. The head of the household was given priority to answer to the questions. In some cases of the absence of the household head, another senior person of the family was considered to the respondent. Interviews were conducted with various key informants to know about the study area, vulnerabilities, adaptation strategies and the economic conditions of households.

Focus group discussion was conducted with two groups, one comprising with only women and another comprising with only men, with a checklist about their predisposed vulnerability, risks, livelihoods, opportunities, relationships of trust, membership of groups, bonding, bridging, and linking or networks, access to wider institutions and obstacles towards adaptation to cyclone risk and strengthening of economic security through social capital.

Secondary information at household level was collected from the Bangladesh Bureau of Statistics (BBS), the Local Government Engineering Department (LGED) and the Ministry of Disaster Management and Relief (MoDMR). Historical data of cyclones, damages and relief operation data on cyclones, Standing Orders on Disaster (SOD), cyclone related awareness and preparedness documents and so on were collected from MoDMR.

3. Results and Discussion

3.1 Socio-economic status of households

Most of the people in the study area are depend on agriculture, fishing and day labor. The distribution of the occupation of the household head is presented in figure 2 below. Majority of the people in the study area are farmer (47%), fisherman (17%) and businessman (19%). A notable proportion (13%) of the family members of the households is daily worker and motorcycle driver (4%). In the study area, motorcycle is very familiar type of vehicle used for public transport and boats are mainly used during the dry season.

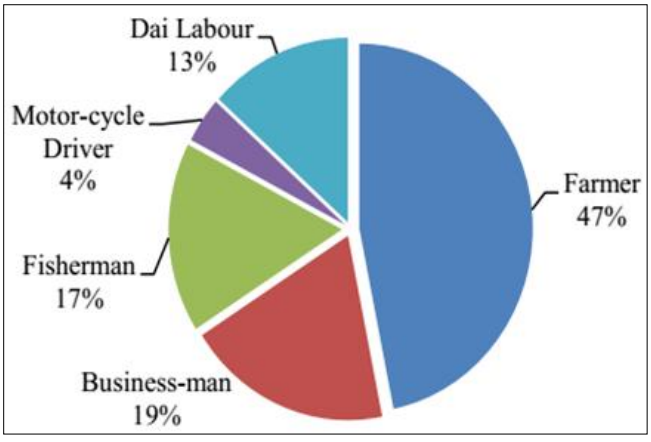

Fig 2: Occupation of the household head

From the study, it was found that the majority of the respondents (44%) incomes per month were 5,000 to 8,000 Tk. On the other hand, only 13% respondents' monthly incomes were more than 10,000 Tk. The monthly average income of the households was 8,300 Tk.

3.2 Economical adaptation mechanisms of households to cyclone risk

In every disaster-prone locality, people have some habitual adaptive strategies; but the type of response and effectiveness of such strategies may vary over time and the adaptive ability may be overwhelmed by the scale of the disaster itself. Respondents in the survey have varying ways to adapt with cyclones. The most popular coping in both areas is relief from the governments. This is very much similar to the previous findings of other studies. Sometime they have to offer their precious things for lending and later, they lose to pay the interest. About 31% households of the study areas take this adaptation option. Another effective adaptation is working for money or food. After disaster strike the Government and other development agencies offer some development works for repairing/restoring of rural infrastructure, key installations public services and shelter instead of food or money, this is known as Food for Work (FFW) or Cash for Work (CFW). About 6% people in the study area take this option for their household's adaption after cyclone or storm surge. Migration rate is very insignificant and more or less similar in both areas as those people have already migrated from other places and they understand the miseries of migration well and do not want to repeat. Most of the households (10.8%) coped with the effects of disasters by using personal savings, borrowed money from relatives (16.7%), borrowed money from NGO is (10.8%), asked children to work (1.7%), borrowed money from a bank (5.8%) and sold or mortgaged assets (1.7%), respectively (figure 3). One coping mechanism was to stop the schooling of children to migrate temporarily to other areas, as well as to reduce the use of expenses on food and other household consumptions. Households economical adaptation mechanisms are shown in a bar diagram below.

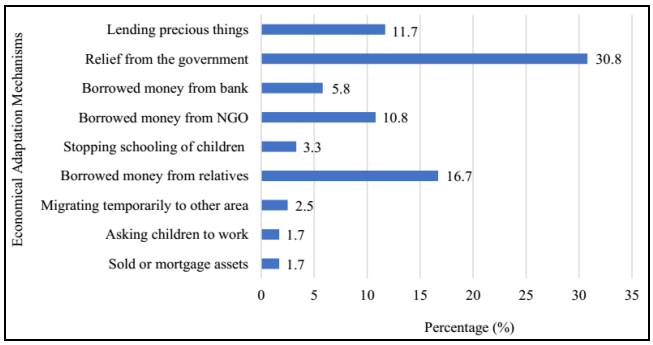

Fig 3: Economical adaptation mechanisms of the households

3.3 Household's social adaptation mechanisms

Different social adaptive mechanisms identified all over the globe depending upon people's cultural and socio-economic context rather than the vulnerability severity or risks. Respondents of the study area have very well social adaptation mechanisms for immediate preparedness to cope with cyclone. The social adaptation mechanisms of households are also shown in a bar diagram below (figure 4). About 41% of household's respondents take some precaution for their houses; such as, raise their house plinth to avoid storm surge water (31.7%), richer people build their houses with brick (9.2%) to save their houses from storm or cyclone and some people made a second ceiling under their

main ceiling called *Pataton*. They keep valuable thing on there to save household belongings from the tidal surge. Similar structures found mostly in other flood affected areas in Bangladesh. The people of the study area made *Machan* and *Pataton* to keep their things in the time of storm surge (15.8%). About 1.7% of respondent's store their food grains, such as seed, rice, puffed rice, flattened rice, potato, dry fish for disaster recoveries by digging hole in their yard covered with polythene bags or sometimes they store in a clay pots and tied it to their roof top. Earlier studies show some similarities only for coastal areas. In the recent years, the people of the study areas are more conscious for their livestock and take appropriate measures for their safety. After the receiving early warning they take their animals to the shelter or to the other safer places in any neighbor's house (21.7%). Because of remoteness from the city and limited options for work approximately 7.5% of people cope by reducing their number of meals. Selling labor in advance with cheaper price is found 12.5% from the survey. Collection of food from nature is nil in this area as nature is very hostile here and saline water impedes various naturally available foods to grow. They produce *rabi* crops and most of the people has livestock and some households has poultry farm.

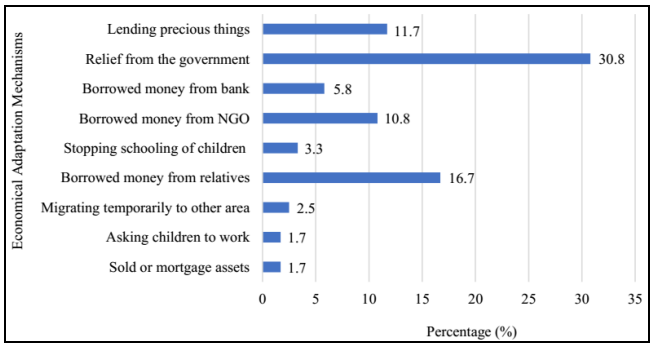

Fig 4: Households social adaptation mechanisms

3.4 Social capital information of the households

3.4.1 Access of mass communication and individual communication

The people of the study area have access to mass communication and individual communication channel for disaster information and dissemination. The popular mass communication channel found in the study area are – radio, television and newspaper for getting disaster warning information. Most of the respondents in the surveyed areas received disaster warning information from their radio, neighbors and kin as well as the disaster management committee. The main source of warnings for disaster came from the television (60%), disaster management committee (4%), neighbours and kin (23%) and radio (13%), respectively (figure 5). A few proportions received early warnings from their mobile phones. However, it is important to note that, in the study area, some households did not have a personal television, radio or mobile phone.

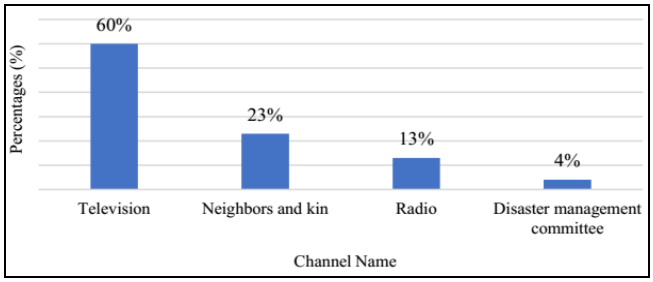

Fig 5: Different channel for getting disaster warning information.

The people have also access to some individual communication channel for getting different types of information in terms of preparedness and mitigation as well as for improving their economic security. From the survey, it was found that they have very less access to disaster mitigation worker. About 18.33% people in the study area have access to union porishad. They get different types of information, relief material information, VGF information etc. from union porishad. About 15% people get agriculture related information from agriculture extension officer or worker, 28.3% people have access to health and family planning officer. But only 3.3% people in the study area have access to disaster mitigation worker and 10% have access to NGO's (table 1).

Table 1: Frequency of access to information

Items/Variables	Frequency	Unsatisfactory (%)
Disaster mitigation worker	4	3.3
Agriculture extension worker	18	15
Fishery department worker	6	5
Health and family planning	34	28.3
Union porishad	22	18.33
NGOs/CBOs	12	10

3.4.2 Training opportunities

Form the survey, it was found that the people have less experience in agriculture, fishing and disaster related training program. Bonding and linking social capital is an important asset to attend these training programs. From the survey, it was found that some respondents of the study area knew about the training program from NGOs' worker, neighbors, and kin or from local leaders. Through these training programs, the people can develop their experience, knowledge on agriculture, fishing and disaster risk reduction related activities. Across the survey, it was found that most of the respondents of the study area (65%) do not have any training experience. On the other hand, the rest (35%) have some training experience which was organized by different government organizations, non-government organizations, community-based organizations etc. The respondents attend more than four times (3.3%), some respondents attend three times (5.8%), few of them attend two times (10.8%) and the rest attend one time (15%) in different training programs. Level of training program or the number of times they attended in a training program are shown in a pie chart below (figure 6). The chart shows that the people of the study area have very low experiences of attending different training program (e.g. agriculture related or disaster risk reduction related).

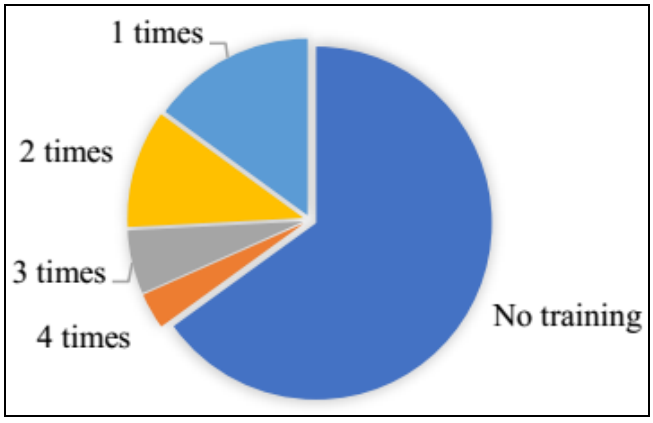

Fig 6: Level of training program.

3.4.3 Relationship of household head within the community

Relationship of household head within the community is an important social capital for strengthening economic security. By the relationship, they can get different opportunities from the community such as daily work-related information, VGF information, old allowance related information and so on. In terms of relationship of the household head, most of the respondents answered that they pose good relation within the community. From the survey, it was found that about 60% respondents maintain good relation, 40% respondents maintain very good relation within the community. Most of the respondents supposed that they always assist each other during any crisis situation. It is a very good sign of bonding and bridging social capital within the community.

3.4.4 Access to government, non-governmental officials and cooperative association

From the study, it was found that the communities in the study area have limited access to government or outside institutions. From the interview it was found that a large proportion (45%) of the communities has limited access to government officials. But it was found that most of the respondents in the study area do not get any facility from agriculture extension officials. About 80% of respondents in the study area answered that they do not ever communicate with them for developing their agricultural production or getting any help from them. Also, agricultural extension workers do not ever visit their area. For this reason, the people of the study area do not get any update facility for improving their agricultural production which can hamper their economic security. Village representatives reported that development agents may distribute or sell subsidized inputs if they have them available, provide guidance and instruction on government recommendations or instructions, and provide training on agricultural topics. Across the survey, the respondents answered they have a full-time community health worker. About 55% of respondents answered they communicate with the health worker less than one time per month and the rest 45% do not communicate with them for any health-related facilities.

Also, the household survey data indicates the low levels of government involvement in the study area. When confronted with worsening conditions, such as water and food supply, about 30% of household's respondents said they get help from the local or national government. Notably, few households indicated seeking help from the community when affected by poor environmental conditions, and mostly indicated self-reliance and hardship. Only 21% of households reported having received some form of government assistance, however, primarily healthcare, education, and food assistance. These results suggest that government is neither absent nor prominent in the study area households. Overall, our qualitative results from the interviews and household surveys support that the study area have limited access and support from government institution.

Some non-government organizations (NGOs) are working for the benefit of the people with numerable activities. Their main tasks are to organize these people, create awareness in them and make them development oriented. About 23% respondents reported that they have access to NGO officials and they attend different training program organized by these NGOs. Also 12% of respondents reported that they are attached with the cooperative association.

3.4.5 Relationship with the local leaders and community elders

Relationship with the local leaders is an important social capital. Through this capital local people can get different opportunities (e.g. agricultural facilities, job related facilities, solving local conflicts etc.) from them which can strengthen their economic security as well. From the household survey, it was found that about 60% of respondents have a good relation with the community elders and rest 40% have a good relation with the local leaders in terms of solving problem. Across the survey, more than 40% respondents answered they always get help from them, 25% answered sometimes, 20% said they rarely get help from them. Only 15% of respondents answered, local leaders did not help them when they asked for help.

Another measurement of community level social capital is how the community deals with conflict. For less serious violations, community people rely on elders. If a conflict was too serious or unable to be resolved, then community leaders said that they would seek the assistance of the police and formal justice system.

Table 2: Local social capital of the households.

Local social capital	Percentage (%)
Access to agricultural extension worker	20
Communicate with the health workers	55
Assistance the government officials	21
Received Training from govt. officials	17
Access to NGO officials	23
Connection with the cooperative association	12
Relationship with the local leaders	40
Relationship with the community elders	60

3.5 A framework for strengthening economic security through social capital for household's adaptation

A conceptual framework for strengthening economic security through social capital for household's adaptation to cyclone risk is shown in the below. This conceptual framework develops an understanding about how social capital strength socio-economic security. This framework has three broad parts – social capital, economic security, household's adaptation. To reduce the vulnerability of cyclone risk, household's adaptation is an important factor. Social capital has broad area of focus such as bonding, bridging, linking, trust, cooperativeness, shared norms,

kinship, communication and networking. These focus areas can play an important role for developing social enterprise. Different adaptive mechanisms are directly linked with the social capital. These adaptive mechanisms are loan from banks, NGOs and cooperative associations, borrowed money from relatives or neighbors, access of disaster warning information, relay on external assistance etc. which are directly or indirectly linked with social capital. The greater social capital of a community can foster economic security of households. Banking sector plays an important role to develop economic security. Through linking, networking and communication people can easily get access of loan from government, private and non-government banks for their future development. Different NGOs have included microfinance program. Local people can easily get access this program by their strong linking, networking and trustworthiness social capital with these organizations. The people can start cooperative association with themselves by their strong bonding and bridging social capital. Social capital can also play a vital role to get job opportunities. Here linking, networking and communication social capital can improve job opportunities, job variance and job diversities as well as strengthen economic security of people. Finally, through social capital, economic security and household's adaptation mechanisms, coastal people can minimize their vulnerability to cyclone risk.

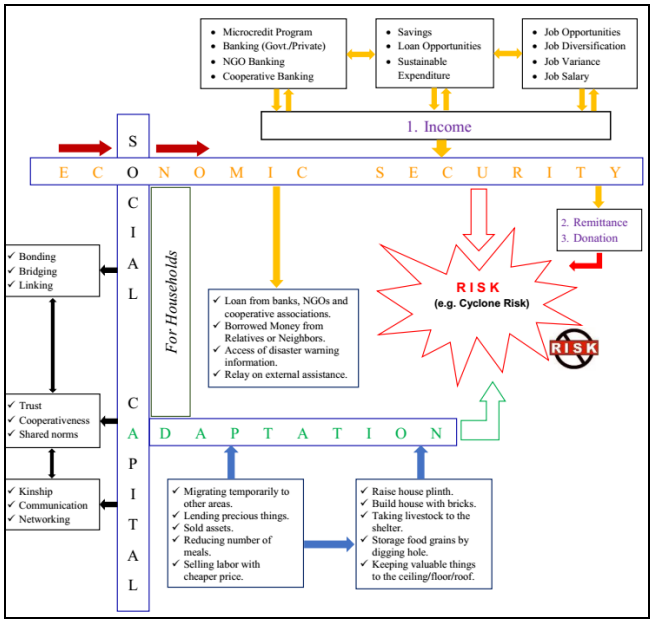

Fig 7: A conceptual framework for strengthening economic security through social capital for household's adaptation to cyclone risk

4. Conclusion

Building social capital has typically been seen as a task for second generation economic reform, but unlike economic policies and institutions, social capital is not created or shaped by public policy. But it is inherited throughout local community's successive generations. Coastal people of Bangladesh are very much vulnerable to natural disaster, mainly cyclone and storm surge. Household size and other characteristics such as educational status, socio-economic status of the households, savings and loan information of the households and housing conditions create greater vulnerabilities to cyclone. But people of the study area have their own adaptive mechanisms to cope with cyclones. Household's economical adaptation and social adaptation were assessed to measure their adaptive mechanisms to cyclone. Most of the people in the study area depend on relief and external assistance from government and charitable organizations (30.8%), borrowed money from relatives (16.7), lending their precious things (11.7%), borrowed money from cooperative association and NGOs (10.8%) for their economical adaptation to cyclone risk. Most people in the study area raise their house plinth (31.7%), taking livestock to the shelter (21.7%), keeping valuable things to the safer place (15.8%), and reducing number of meals (7.5%) for their social adaptation to cyclone. The early warning system has been developed over the recent years. They get warning information from different channels.

Strong bonding, bridging, linking and networking social capital can play an important role for developing the household's adaptation mechanisms to reduce their socio-economic vulnerability. Social capital information of the households was also assessed by different parameters such as relationship of the household head within the community, level of trust towards neighborhood and relatives, relationship with the neighborhood, training opportunities of the households, access to government officials, non-government officials and cooperative association and relationship with the local leaders and community elders. It was found from the study that the communities in the study area have limited access to government or outside institutions as well as they get very few training opportunities from government and non-government institutions for developing their economic security. But the households have good relationship with the community, local leaders, community elders, strong level of trust which help them to strengthen economic security as well as develop their adaptation mechanisms to reduce vulnerability to cyclone risk. A framework has been developed at the end of the study to measure how social capital can strengthen economic security of the coastal people for building adaptation to cyclone risk. This framework describes how to develop economic security and how to develop adaptation mechanism to reduce the vulnerability to cyclone risk.

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