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Full Length Research Paper

Different economic and policy perspectives in micro population for sustainable development: A study of the Haor livelihood in Bangladesh

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Criteria of development approaches and their schemata have evolved out of historical social practices. Interpretation of social events is guided and constrained by the prevailing rationality which itself reflects the dominant constellation of power. With the course of change of time and modernization, a number of development approaches have taken place especially in the context of developing nations. However, the discourse of the development of a less number of populations who are having geographically disadvantaged, unskilled and physically challenged positions is always seen as critical, since it requires high investment from public subsidy but provides less public and private returns. Factually, without the development of these populations, state mission will be missed out. Considering this is an issue for research in the area of public policy and development studies, this study was conducted in Bangladesh with a scientific adoption of both quantitative and qualitative methods, intending to discover an approach that helps the particular group to develop without hampering the return to the investment made by the state. Although, this study was conducted in Bangladesh, the development approach discovered can be used to many other developing country contexts.

Key words: Economic approach, economic model, development, sustainable development, Haor, Bangladesh, policy, governance and regulatory control.

INTRODUCTION

This paper studies the development of people's livelihood in a geographically disadvantaged area in north eastern Bangladesh through different economic postulates. The economic theories behind a sustainable development can be adapted in many ways. The paper investigates the appropriateness of the proposed approaches to see which one is the most beneficial for the livelihood of that area. Progressing towards development and maintaining the level of development curves high or even steady are always considered as a challenging and a tough task (Alam et al., 2010). All that the world calls development, are hovering around the economic approaches for a sustainable development. Hence, the current study focuses on the feasibility of four approaches from the theoretical school of thoughts from economics. The plausible approaches are as follows:

One theory postulates that, the state would help the micro population with a minimal economic investment and a skilled approach which may lead to high productivity (Alam et al., 2010) It would also take exogenous and endogenous factors which are available into its account. In reality, the expected returns may not be there. The reason behind it can be that, the area under investment may not be having the productive friendly factors and that critical area in question may not be having the infrastructural facilities to facilitate the productivity (Alam et al., 2010). Therefore, this particular

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approach is contentious. Hence, the endeavor is to look for another approach because of the limitation that we have cited or the circumstances force the country to face.

Another approach is that, the economists can think of investing on another area and the accrued income can be shared by the people in this area to develop the area that is lagging behind economically. But it may not work out in the way it is thought about. The reason behind it is that, the people who are benefitted by this investment may not be altruistic. They are not being altruistic because the risks involved in the investment are not likely to be shared by the people who are helped in those critical areas. In line with the first approach, the second approach is also under debate which is not being voted for. There is a third approach that can be tabled. It explains about migration and consequential development. But the big question is to find out if the people who will migrate may not be having the capital (financial, human, and social). There may not be suitable jobs available in the destination. As a result, the new migrants will either be unfit in the new place or may be an extra burden for the preoccupied labor market. Moreover, the place of destination will be overburdened to provide basic utility services needed. The fourth option is talking about an *in-situ* development approach. It postulates that, the state will develop a specific group of people to be productive and disburse the output amongst the rest of the people in that particular society. But it is also under dispute because it may produce some sleeping partners within the said community and the expected returns may not be gained. This approach is in conjunction with the second approach which supports none sharing of the evolving income at great risks (Sen, 1999). Since the aforestated description postulates that, the concept of development varies with its contextual and inductive objectivity; all the mentioned four approaches have their own limitations.

Therefore, the geographically difficult regions like upland areas in the Philippines, hilly areas in south India and Haor[1] area in Bangladesh are on the lookout for effective developmental strategies. Our perspectives of sustainable development will change if we can adapt the first approach mentioned earlier by changing the people's understanding of the philosophical ground of development of their own region.

Research problem

As agricultural activities in rural Bangladesh are subject to some controlled, semi-controlled and uncontrolled factors, the amount of agricultural labor is gradually decreasing and subsequently landless labor is increasing day by day. The people of this area under study are working for long hours even on weekends and without a break. They are surviving on minimal salary schemes and struggling for a decent life (Alam et al., 2009). In contrast, the people of this area have no access to resources to get the economic returns by increasing their productivity. Therefore, the debate is not only limited to natural resources but also to human and social factors. Along with these constraints, the ecological barriers such as landslides, droughts, flashfloods and long annual deluge are narrowing the scope of livelihood.

Therefore, the people of underprivileged areas are constantly living under difficult circumstances and looking forward to a promising future to better their financial situation (Alam et al., 2009; Sen, 1999). Development theories in economics deal with economic growth (Alam et al., 2009) - which is a sum total of various sectoral contributions. Thus, doubling the investment in agriculture cannot be a viable solution to double the people's income from 22% (GDP) to 44% (GDP).

Research questions

The aim of this research is to understand socio-economic development of the people of Haor, who have been living there for hundreds of years. Despite having a population of 20 million covering one fifths of the country's land area and producing 20% of the country's staple food, the area still remains underplayed for the last four decades since the independence of Bangladesh. Therefore the questions which come under research are:

What are the socio-demographic characteristics of Haor archipelagos?
What are the sources of income and how do they manage their income?
How their livelihood is interrupted and what is their situation?
Can the local resources help to overcome their predicaments?
What can the government do to better their socio economic conditions?

CONCEPTUAL FRAMEWORK

To understand the developmental concept of the aforementioned problems, a theoretical framework is essential to deconstruct the facts into its meaningful adherence. The theories are discussed here to get a clear picture of the theoretical framework in understanding the issues and elaborately pursuing the problems towards a visible solution through constructive research. The main theories in question are as follows:

Broadly speaking, the theories in development can be categorized under two groups- reductionist and pluralist approaches (Cruz et al., 2009) and along with historical identification, such categorization is finely scrutinized by

[1] Haor is a low lying, bowl shaped flood plain originated from the tectonic depression. This area is criss-crossed by numerous rivers coming down from the hills of India with huge amount of runoff water frequently causes flash flood and annually causes extensive flood routinely during monsoon.

Alam et al. (2009) and markedly identified three schools of thought: 1) Growth model (reductionist approach), 2) transformation of society (modern society- sociologist approach) and 3) human needs ideology (pluralist approach) - prevailing in the discourse of development.

Reductionist scholars (e.g. Solow, Romer, Meddison, Hicks, Schultz- to name a few) consider economic development of a country should be assessed by measuring its gross national product (GNP)[2]. Both exogenous and endogenous growth models believe in investing in human capital and thus raising the productive capacity of a society (Alam et al., 2009).

The sociologists (e.g. McClelland, Weber, Inkeles – to name a few) raise rational argument as an issue of modernizing a nation to invoke economic development (Alam et al., 2009). In the course of modernization they give importance on structural transformation (Özde□er et al., 2007). Modernization is thrust upon education, technology and industrialization as the agents of transformation (Alam et al., 2009). The pluralist scholars (e.g. Sen) consider economic development of a nation from human needs point of view. As economic development is the ultimate goal, the pluralists prefer the needs of individuals such as their freedom, entitlement, equity, participation, and empowerment rather than GNP (Alam et al., 2009; Cruz et al., 2009; ODI, 2001). Jhingan (2003) asserts that economic development of a nation can be measured in four ways: 1) GNP, 2) GNP per capita, 3) Welfare and 4) Social indicators. But these parameters have pertinent and rational drawbacks in the process of measuring the economic development. As Sen (1983) argues that, GNP per capita data cannot be considered as a good yardstick of economic development analysis and thus, GNP strategy which aims at increasing productivity and income fails to take into account the problems associated with basic needs like nutrition, health, sanitation, housing, water and education. The improvement in living standards through providing basic needs cannot be measured by increasing GNP or GNP per capita (Jhingan, 2003). The disbursement of GDP may workout in the field of economics. It may not help the people who need nutrition, health, and sanitation as it has been already discussed for the case study of Haor.

When GNP fails to reach the expectations of measuring economic development, some economists (e.g. Hicks, Streeten, Goldstein, Ranis, Stewart) have considered 'social indicators' to measure economic development and those indicators are pointed as basic needs for development. The merit of social indicators is that, they are concerned with ends and subsequently economic development is a means to these ends (Jhingan, 2003). Being a developed human capital, a nation is yet to achieve economic growth as low investment ratio and insufficient amount of industries are not capable to absorb those soft resources to increase the nation's total productivity. Country like Somalia, Sri lanka, Cuba and Egypt had below average economic growth even by providing good basic needs (Fei et al., 1979; cited in Jhingan, 2003). The case of Haor village issue is also focused on these issues with the alignment in targeting the economic development for the concept of Human capital development.

A more pragmatic developmental strategy is found in Sen's works on human needs thesis where emphasis is given on person's functionings and capabilities to achieve economic development through human development. It goes beyond the theory of developing human capital to extend social, economic and political freedom to make life meaningful to live. The discussion above reveals that the course of development has gradually been changing (Table 1) as the concept of development has changed in respect of its contextual and inductive objectivity. When the development of any rural and geographically remote locality- the supposed area of this study- is concerned then the existing social structure and prevailing ecological attributes compel to consider none but Sen's human needs view as a feasible strategy of development.

According to this view an apparent social transformation is obvious when a person can have political and civil liberties along with good economic opportunities coupled with systematic social identity. All this should be accessible to the common man as public facilities with a positive lenience. Such favorable activities of a state all together, can bring economic development through achieving social freedom in a new society (OID, 2001). Both the economic freedom and social freedom are interrelated and none can succeed but other (Thomas, 1981; UNESCO, 2001 in Alam et al., 2009) then the consequence of a country's social freedom results in its economic development and it is reciprocally synchronized as per the theories of development (Alam et al., 2009).

Economic development and decentralization

Though decentralization is a complex phenomenon but in theory it leads to rapid economic development (Iimi, 2005). It is believed that, physical and institutional proximity of the government with local citizens, provides informational advantages. Therefore, a decentralization of political and administrative power to the top-down approach (Bardhan and Mookherjee, 2005) results in economic efficiency in local public services and promotes the ultimate outcome of economic growth, if accountability and transparency in government formal and informal provisions can be ensured (Davoodi and Zou, 1998). This understanding has limitation which is based on the mechanism of 'voting with feet'. It means that there will be a preference to migrate from current place to another place if the local government is not efficient and effectively responsive to the citizens' needs

[2] GNI is a product of GNP which may be equal or more or less. If the surplus or deficit greatly differs, the county's economic growth will be halted. It is because of sharing of global economic competition.

Table 1. The 'common currency' of development.

Concept	Old approach	New approach
Individual Interest/ advantage/ well-being	Income/consumption/utility (that is individual happiness and/or desire fulfillment)	Human capabilities and opportunities – with an explicit role for freedom, agency and rights
Food security	National food availability	The food entitlements of individuals and groups
Poverty	Deprivation in income / consumption / expenditure	Deprivation in human capabilities such as knowledge, longevity and living standards (e.g. access to water and basic services) – more emphasis on self-expression, self-esteem, participation and empowerment
Ultimate ends of development	Economic efficiency/ Maximization of GDP per capita	Human development and 'development as freedom' – the expansion of valuable capabilities and the realization of freedoms and human rights

Source: ODI, 2001.

(Iimi, 2005; Davoodi and Zou, 1998).

The performance and accountability of the local government are prone to bureaucratic corruption in developing countries (Bardhan and Mookherjee, 2005) and situation becomes acute with their insufficient financial resources and administrative capabilities which impede economic development (Zhang and Zou, 1998). To achieve economic development two aspects are important- political devolution and fiscal decentralization on expenditure which brings and enable people's participation in public decision making (Iimi, 2005; Davoodi and Zou, 1998). But the implementation of these approved decisions are critical to crucial policy issues of financing local government expenditure and maintaining intergovernmental vertical relationship (Meloche, 2004; Shah and Thompson, 2004) along with very limited access to credit by the local government (World Bank, 2000). Local governments in developing countries are allowed to have a little autonomy over procurement and distribution of merit goods. In contrary, the authority of collecting revenue and disbursement of grants to the local regions are controlled by the central government. At the same time, local governments are subject to interest group who finances the political party's campaign. The nature of decentralization does not work out in the poverty stricken geographically isolated area unless fair and functioning electoral process is performed and until a high level of political awareness among local poor is realized (Bardhan and Mookherjee, 2005). The common feature of governance of disadvantaged Haor area is the absence of blending between the central government and the local government for which the people are the victims. Moreover, the people are not aware of the reciprocal rights of which they are the victims. This is a serious issue in the area of Haor to be addressed.

Decentralization ignores the size of the population and geography which are critical to development because the decentralization in cities is not like devolution in villages. Where communications are difficult, delegation is more desirable because facilities are crucial for level of investment in persuasion of development. In delegation processes the local governments (quasi-political government) have given authority to control local resources. They are responsible to retain quality and manage resources, collect taxes, charge the exploited. Decentralization issue of any geographical area not only depends on its critical mass, activities and their income but also on its efficiency on the good governance paradigms. An established delegation system could be endorsed to accumulate capital through 'externability' of the services, its 'chargeability' and its 'technicity' (Prud'homme, 1995). Though, the above mentioned and other pertinent corollary problems exist, the fact remains that decentralization is instrumental in endorsing economic development (Iimi, 2005).

Development on humanitarian grounds

The kind of relief that a state extends to the people in need during a natural calamity or any critical period is under international criticism. It is because the financial help is limited to the management of the crisis alone. Secondly the money that the people receive cannot be used for a long term investment because of the crisis at hand and their vulnerable life situation. Last but not the least, a continuity of such relief funds will make people complacent and lethargic. The Haor area is aligned to the need of humanitarian help on economic fronts. Therefore economic return may not be calculated in upfront. But once the humanitarian grounds are taken care of, the economic front will automatically come up.

Development through micro funding

The other approach which can be thought about is micro

funding. But it has its own limitations:

Financial resources

For economic development the people of Haor may have financial resources from the government, private and international sources which may provide various income opportunities. International aids do not supply capital for micro investment rather a kind of development through building homestead protection wall and submergible roads. NGOs limit their works in disbursement of credit to the women without considering whether the credit amount is adequate enough to the productive capacity of the household. Practically, local money lenders provide the lion's share of credit. Despite usury and the fact that, they charge a very high rate of interest, most of the cases are dealt with a humanitarian attitude if vulnerable situa-tion like crop failure, severe health hazard, homestead and house damage, death case etc. arise.

The credit services provided by NGOs are totally indifferent to the humanitarian side of livelihood of Hoar people.

As an alternative to the aforestated sources, the government can be the best supplier of credit for those people with its low interest rate along with flexible installment facilities. But disbursement of such credit is a herculean task. Firstly, public financial institution is neither available in the Haor area nor accessible to the people of Haor. Secondly, the conventional system may be difficult to understand for them.

Thirdly, the illiterate people must have a broker to have such type of credit. Last but not the least, the landless are ineligible and the location of land and residence are sometimes under a different jurisdiction.

Geographical problems

Remoteness of the geographical location of an area imply structural problem in economic development. Without road communication and transportation facilities, secur-ities; establishment of financial institution or investment, the credit market remain uncompetitive. Along with geographical constrains, market detachment impedes establishment of labor intensive high leverage industries. Non-proximity of growth centers demotivates the people in using of micro-funds which may be helpful to withstand the natural calamities in the day to day diversified livelihood.

People as a problematic factor

By increasing the capacity of productivity, people some-times are found as a problematic factor. People have low labor productivity, low nutritional standards, ill health, illiteracy, lack of training and occupational mobility. To increase financial capital, the people have to be engaged in income earning activities. There are cultural and psychological factors which discourage people to work. It overtakes the wage rate and supply of labor Joint family system which makes people lethargic and certain occupations are reserved for specific group of people. In under privileged areas people are mostly conservative, superstitious and fatalists. This is a trend for an uneconomic culture which dispirits them, to use financial resource properly to increase their economic productivity.

Politics and governance

Political and administrative factors are also influencing micro-funding to bring economic development. Along with peace and stability, the effective functioning of product markets, financial and non-financial factor markets, infrastructure services, legal protection and institutional framework encourage entrepreneurship. But mal-governance and weak political structure hinder economic development. A government must offer services to society to achieve desirable economic development which is totally absent in the under privileged Haor area. Distribution of merit goods has been politicized and without payola, it is impossible to get any loan from public financial systems. Good governance and stable political condition is essential for capital formation. The prevailing political practices and institutional arrangement do not promote the micro funding which matters for the level of productivity of labor, increased output, wages, employment and further capital formation.

Development approaches and models are keys to the development strategy and development process and implementation that a country considers. Within this process, a policy for national development works as a role model, integrating different macro and micro units of policy which are designed or developed for the stated development goal. In spite of this role model of policy, it is unable to function without the support of governance and regulatory control. Governance and regulatory control works as engine oil for policy, through its formal and informal provisions of operation. It is thus important to have a correlated understanding between policy and its governance and regulatory control. Politics is a pattern that is shaped by the governors, administrators, legislators for the people of a state; it thus always has a major role on both policy and governance and regulatory control. Consequently, without having a firm political commitment towards any development approach and model, nothing will work in action or real life of practice. Keeping all these factors and their limitations in view, the researcher thought of devising a new solution where the people of Haor area can be helped and they can become economically independent on a permanent basis.

PROFILE OF BANGLADESH

Out of a population of 120.44 million, 76.47% are living in rural area (BBS, 2001). The majority of this population

are formally or informally depending on agriculture. Agriculture, forestry and fisheries together occupy 48.52% of total labor force. But these sectors are highly vulnerable to natural calamities such as floods, tropical cyclones, draught, tidal bores etc. which occur almost every year pushing rural people on the edge of despair. Bangladesh is a country of rivers and the livelihood is subject to natural calamities of flooding and cyclone. The primary causes of excessive flooding in Bangladesh include several factors like climate, geology, geomorphology, deforestation in the Himalayas and global warming (Khandaker, 1992). Flood, although, is a fortune[1] of Bangladeshi farmer but its magnitude of devastation also deploring the socio-economic condition of the whole nation.

The consequences of flooding have an enormous negative effect on the country's economy, human lives, agriculture, communications, livestock and properties. Land is scarce in the whole country. The proportion of households owning no land has increased to 10.7% in 2005 compared to 10.2% in 1996 (BBS, 2005). The floodplain fisheries are essential for the livelihood of many people in Bangladesh (Craig et al., 2004). Though agriculture dominates the economy, fish supplies 70% of the daily animal protein intake of the country (Alam, 2004) and provides non-farm livelihood opportunities[2].

Distinctive features of the Haor area of Bangladesh

The present study is focused in the northeastern Haor basin of Bangladesh which is geomorphologically under the 'major floodplain basin' (Brammer, 1990) which hints the vulnerability in inhabitation. The Haor basin is a wetland ecosystem with an estimated area of 8000 sq.km (BWDB, 2005)[3] and covered with an area of about 2,045,000[4] ha. Specifically the main Haor area consists of 5 districts namely Mowlovibazar, Habigonj, Sunamgonj, Kishoreganj and Netrokona. Annually, the Haor area remains 5 to 6 months under water which is called non-crop season and rest of year is suitable for *boro* (dry season paddy) cultivation. Agriculture is the main source of livelihood in the study area. Directly or indirectly, all other sources of income of this disadvantaged area are subject to harvesting of crops. But early flash floods often cause extensive damage to the crops. Since early flash flood damages huge *boro* crop in the northeastern Haor area, Bangladesh is likely to face a severe food crisis by 2050. Because of a shift in rainy season (due to climate change), future flash floods will be more frequent than before. Water logging during April-June, the high time of *boro* cultivation will obviously take its toll on *boro* output in the Haor area (UNB 2009)[5].

Fishing is the best optional source of income for the Haor people (Alam, 2004). Besides fishing, there is little work during non-crop season in the Haor area (Gardener and Ahmed, 2006). The Haor area supports rich fisheries after the water have receded. Apart from the actually professional fishermen (*jele*), there are seasonal participants in fishing (Craig et al., 2004). People are occupying fishing seasonally mainly because of poverty. Since they are landless and marginal farmers, fishing has been conceived as a critical component of their livelihood (Alam, 2004). Unfortunately nowadays, nobody is allowed to fish even during monsoon in the disadvantaged area of Haors and Beels[6] to secure a livelihood. From an economic point of view, the incidence of poverty is very high which about 50% (Kam et al., 2005). In some Haor area that amount varies from 61 to 81% (Rahman and Razzaque, 2000). The incidence of poverty fluctuates with income seasonality (Khan and Islam, 2005).

The livelihood in the Haor area is precarious owing to failure of governance (Islam, 2005). The flood control measures of BWDB (Bangladesh Water Development Board) are often faulty and made the village vulnerable to flash flood. The dams were renovated at the eleventh hour and left incomplete. So the water can get access into the crop land and ultimately loss of whole crops within a day. The recurrence nature of this unconquerable natural devastation turns the rich down to the marginal farmer and even pushes them to the edge of the poverty line and consequently forcing the locals to migrate (Islam, 2005). The political governance of Bangladesh has direct and indirect impact on the livelihood of the Haor people. Without political and institutional affiliation, the poor (seasonal fisher) and *jele* (professional fisher) are not allowed to fish in the *Jalmahal*[7] (Alam, 2004). Ownership and control of such common resources usually goes to the elites[8] who have strong political attachment.

[1] The truth is that without annual deposition of organic-rich silts from the Ganges and Brahmaputra Rivers, intensive rice and jute cultivation characteristics of the country would be impossible (Khandaker, 1992).

[2] The fisheries sector provides full time employment for 1.2 million people. A further 11 million people are engaged in part-time fishing, fish trading, food processing, making fishing equipment, fish and shrimp farming, hatchery , nursery operation, and working as fishery laborers.

[3] Bangladesh Water Development Board (BWDB). But by expert 25000 sq. km (banglapedia Bangladesh) the probable reason is that this amount may be included the total submerged area during deluge. This connotation may have supportive ration as Craig et al. (2004) state from total 80,500 sq. km (55% of the country) floodplain 26,000 sq. km. , in an average, is submerged on a seasonal basis (June to October) in response to monsoon rains (March to September) and snow melt.

[4] The World Conservation Office Bangladesh (IUCNB), 2005.

[5] http://www.thedailystar.net/newDesign/news-details.php

[6] These *Haors* and *Beels* are khas or government owned property and perennial in nature. The ministry of Land usually lease out these properties for a period of 1 to 3 years to the public on open tender basis to realize some revenue and obviously because of holding control over institution and politics the auction goes to the people of non-fisher rural rich and thus the poor and *jele* are inhibited to claim their right of fishing.

[7] Large water bodies, fish sanctuary, sometime comprises of large *Beels* and *Haors*.

[8] The rural rich people who are political brokers and con-jointly have strong hold on district administration in a mutual give and take relation.

RESEARCH DESIGN

Method and methodological implications

Method is a set of procedures and techniques for collecting and analyzing data and methodology is a way of thinking about and studying and viewing any social reality (Strauss and Corbin, 1990). In this research, a mixed method (both quantitative and qualitative) approach is considered purposively[9]. Justification of choosing a mixed method is found in different studies (Orr et al., 2009; white, 2002; Place et al., 2007). The quantification (the hard) (Guba and Lincoln, 1994) alone is not capable of explaining the process of development where the nature of reality (ontology) requires philosophical interpretation (Obermeyer, 1997).

This method is helpful to overcome the limitation of quantification in terms of both analytical tactics and interpretation. In studying the development of Haor livelihood, purposively the method is mixed because of its synergic nature. The mixed method will be instrumental to delve out side by side the general aspects of development and micro views of individuals of their regular life, opportunities and constrains of livelihood, their despair and desire in livelihood sustainability and heuristic guidelines and suggested policies for the development of livelihood in the Haor area. Thus, the proposed mixed method provides advantages to capture the prevailing economic developmental problems and advocates the right way for Haor people's livelihood.

Significance of this method

The combination of both quantitative and qualitative methods will provide more insights (White, 2002) which range from general description to in-depth understanding of the process of development (Orr et al., 2009). The qualitative approach acts complementary to the quantitative approach. Suppose the survey addresses the human capital of household head by measuring the level of education, year of working experience, while the focus groups reveal insight into the non-monetary exchange of goods (e.g. vegetable, pulses, grains, boat etc) between households, which are conducive in creating and maintaining social networks, thus reducing vulnerability. In addition, this sort of combination will promote a particular strength to know the relationships in question, that cannot be answered by quantitative survey alone but with the help of qualitative survey with households, groups, informants and local institutions in the survey area can be taken care of. Particularly issues like perceptions of poverty, livelihood strategies, and common rights entail the necessity of a close discussion through blending of both the methods.

Sample selection

Selection of the study area

As secondary information of the study area (which is relevant to this study) was not available, the basis of the current study depended upon primary data. The rationale of choosing the study area rested on Upazila (sub-district)-level Lower Poverty Incidence Map (2004) and Union (sub-sub-district)-level probability of High Level Incidence Poverty Map (2004) prepared by Bangladesh Bureau of Statistics (BBS) in collaboration with the United Nations World Food Program. The data under population census (BBS, 2001) revealed that more than 50% households, in these villages did not have any cultivable land whereas for the rest of the union the figure was about 45%, which may mean that the selected 5 villages are poverty stricken.

Data collection

Data were gathered through conducting door to door household survey with the help of 6 field workers in devoting 12 to 14 h per day including holidays which prolonged for more than 2 months. In the beginning, the 2 girls and 4 boys who were in the survey team (having minimum secondary level education) were given 1 week extensive training though they had the experience in working in population census survey of BBS (2001). For this study, the households were selected in a 3 stages sampling process.

Stage-1

At inception of field survey, the enumeration of all households in the 5 villages was done with the help of short questionnaire which provided information for household income, expenditure, family size and occupation of the household head. The total amount of households was 1265 (though the number was 1050 in 2001 census) which were then categorized into three different groups, in accordance with poverty status. In doing so, an upper income poverty line was calculated to categorize poor and non-poor households. In addition, with the help of calculated lower poverty line extreme poor households were identified from the poor group.

Poverty line calculation: In calculating poverty line for 2008, ratio of rural consumer price index (RCPI) of 2008 to that of 1998 is calculated as - RCPI of 2008 is 195.14 which is divided by the RCPI of 1998 is 113.31 and the ultimate outcome is the ratio of RCPI is 1.722. Then, the obtained number of RCPI ratio is multiplied with the income poverty line of 1998, to get the updated figure for 2008 which is posited in Table 2.

Significance of samples and design of tools: Structure and semi-structured interviews were conducted along with the survey of the census. Questionnaires, focus group discussions and key informant interviews were the main components of our tools. The way the data was collected after census and designed for the research is given as follows. A checklist of our research questions and tools of analysis have been given in a tabular form (Table 3) to rule out the fallacies in our research.

Stage-2 (Selection of sub- sample)

In selecting a representative sample of the population, Krejcie and Morgan's (1970) suggestion[10] was followed in this study. After categorizing the households into non-poor, moderate poor and extreme poor, a random sample of 292 households were selected, the rational share of each category was confirmed in accordance with their proportion in the whole population. Then the households from each group were picked up randomly. In this process, every household was coded. This code was given during census survey, which was written on a piece of same sized paper separately and then folded by one person who was stopped to proceed to the next step. To give the equal weight to each household, all the folded

[9] The details of the process of answering the research questions have been drawn where the domain of appropriate methods are mentioned (Table 3).

[10] Using an efficient method they construct a table which gives the sample size requires be representative of a given population size. According to the table, if the population size is 1600 then the representative sample size is 310. The relationship between sample size and total population is that as the population increases the sample size increases at a diminishing rate and remains relatively constant at slightly more than 380 cases (Krejcie and Morgan, 1970).

Table 2. Poverty line table.

Calculated by	Group*	Poverty line (per capita per annum in Bangladeshi currency-Taka)	Year
According to Rahman (1996)	2	6287	1994
	3	3757	1994
According to Rahman and Razzaque (2000)	2	6879	1998
	3	4111	1998
Calculated for this study	2	11846	2008
	3	7079	2008

* Moderate poor (2) and extreme poor (3).

Table 3. Checklists of our research questions and tools' analysis.

Research questions	Method/s	Tools	Sample*
What are the socio-demographic characteristics of the Haor archipelagos?	Quantitative	Census survey and interviews with structured and semi-structured questionnaires	Yes
What are the sources of income and how do they manage their income?	Quantitative and Qualitative	Census survey, interviews and focus group discussions	Yes
How their livelihood is interrupted and what is their situation?	Qualitative	Interviews, focus group discussions ad key informant interviews	Yes
Can the local resources help to overcome their predicaments?	Qualitative	Interviews, focus group discussions, key informant interviews	Yes
How can the government do to better their socio-economic conditions?	Quantitative and Qualitative	Interviews, focus group discussions, key informant interviews	Yes

*Sample size of census survey covered 1265 households; sub-sample for interview included 292 households, for focus group discussion 55 households and 5 people were selected for key informant study.

papers were mixed up properly which assured the same probability of selection and helped to overcome systematic error in sampling.

From this stock, one folded paper was picked up each time by the field workers and sometimes by the villagers, whoever was present there at that time. After each selection, the pile of folded papers was mixed up again and another person was chosen to pick up another folded paper and the process continued until the rational amount of each category was reached. Then the interviews of selected households were administered with structured and semi-structured questionnaires.

Satge-3

In-depth interviews: At this stage, focus group discussion and key informant interviews were carried out to understand the society and social activities including culture, norms and institution; economical conditions which included income diversification, vulnerabilities, coping strategies, effects and implications of the Haor's properties on the people's livelihood.

Focus group discussions: For profundity of analysis, the study considered focus group discussions to understand the sustainability of livelihood of Haor people. In conducting such discussion, households were identified by giving emphasis on homogenous attributes like gender, education and occupation of households' head. Some discussions were arranged in some tea stalls in two market places where the participants were well entertained by available baked foods and fruits including tea and bottled juice. Some other discussions were arranged in the ground of some homesteads of member of focus groups. Though all the discussions were open, I intervened (as a moderator) by raising some issues which were not properly described or answered in previous interviews. It was intentionally done for the clarification and deeper contemplation on the issues.

Key informant interviews: In this study the key informants are those who are old members of the village communities and school teachers. This sort of interviews provides information on settlement history; social culture, norms, networks and understanding social informal institutions; economics of the area, communal perception and history of poverty; and overall survival strategies are recorded along with other information.

Limitations of the survey

The main predicament which was faced was a sudden flash flood which made the research work very difficult. This was the time when all the people were really engaged in collecting as much crop as possible. The rich and educated people demotivated other people not to co-operate with me because they had a notion that,

the study was going to help me alone and not the people of that area. The people have already been betrayed by government officials in the past who have collected data and have never helped them with the relief finance which was supposed to come from the government. There was a collapse of communication during the flash floods and it became very difficult for the common man to travel from one village to another village. Often, it was impossible to go from one cluster to another cluster.

There was another constraint in the research track to collect data. The people thought the people who are collecting data will achieve their personal ends at the cost of the victimized people. Secondly, the relief amount that was given was negligible and embarrassing for some of the households. I took some measures to overcome these limitations. I conducted meetings with the influential people at different points to make my purpose clear. I met the common man, and I met the teachers and the influential imams to convince them about the good cause of my research and how it was going to help all the people of the Haor Area.

Observation

In addition to the aforementioned methods, research tools and techniques, researchers will use a number of observations based on their personal experiences. Most of the researchers of this paper are the insiders of the problem. Moreover, as a member of the United Nation, one of the authors of this paper was a fundamental part of the national development policy and strategy process considered by the Bangladesh from 2002 to 2009. He has also been working for the development strategy of developing nations for the last 15 years having more than 15 international publications at the area of development studies. The study will also consider a number of data based on his experiences and observations gained through his earlier researches conducted in this field.

FINDINGS AND DISCUSSION

Before going to answer the research questions and draw pertinent discussion on this study, it is worthwhile to understand the characteristics of the Haor households and their income structure. This information will be helpful to grasp the household composition and the sources of their household income.

General information of the Haor households

Table 4 comprises the general characteristics of the Haor households. The household heads are mostly male who are in their middle ages (age range 39 to 44). The average household size (size range 4.85 to 5.64) is larger than national average which is 4.7. Divorced household heads are very rare in the villages which may indicate the strong presence of social cohesion in the Haor society. A vulnerable group of household head is found in all the 5 villages who are widows. Illiteracy rate is very high among the households who are mainly living on poor wage labor. The farmer household head with secondary and degree level education are generally not poor. Household head with primary level of education are mostly farmers, share croppers and wage labors.

In case of economic capital village-2 has the highest 243.8 (2.438 acres) and 7.07 decimal (0.0707 acres) of average crop and vegetable cultivation land respectively. This type of capital is concomitant with the physical capital of household. In this case, with highest amount of land, village-2 has the highest number of earners which is 1.45 in comparison to the other villages. These capitals help households to increase her income which is unveiled by the money matrices poverty status of household. In case of income poverty 31.51 and 68.49% households are found in the group of non-poor and poor (poor 25.34% and very poor 43.15%) respectively in the Haor villages. In case of sociological dimension of poverty (self perception[1]), a big contrast is found by this study where 91.1% households are reported as poor and the rest 8.90% are reported as not poor. This contrast exposes the multidimensionality of poverty which cannot be really understood by quantitative research alone. The average earner of per household is more than one and all villages have seasonal migrants which may mean their efforts to diversify livelihood.

Income structure of the Haor households

Household incomes in the Haor area (Table 5) include incomes received in cash, in kind and self-produced consumption. In this study, a money value was given to receive in kind at the prices prevailing in the survey villages. Household consumptions of self-produced vegetable, livestock, forestry, fisheries, and fruits products are considered as income. The income from crop production activities are estimated as the value of the main product and by products net of the costs on account of seeds, fertilizers, pesticides, irrigation charge and payment made to hired labor, and draft and machine power. The income thus includes the value of utilization of resources owned by the household, such as land, family workers and draft animals. For business enterprises and agro-processing activities, incomes are estimated as gross returns minus business-related expenses, as recollected by the respondents. Salaries and wages are recorded as earnings per months which are multiplied by the number of months family workers are employed in the occupation.

Given importance on agricultural environment, all income components are grouped into crop season (dry season) and non-crop season (wet season) income. The major components of dry season income comprise both farm and non-farm income and wet season components are comprised only of non-farm income (Table 6). The income composition in Table 5 reports that, crop season incomes during dry season contribute the most to the

[1] With reference to Sabates-Wheeler et al. (2005), the question of the out-come of the self-perception of poverty has been asked. Is the financial situation of the household insufficient, barely sufficient, sufficient and more than sufficient to buy all the basic needs? Information obtained from these four categories have to be re-categorized into two groups for estimation purposes: poor (using insufficient and barely sufficient income) and not poor (using sufficient and more than sufficient income).

Table 4. Characteristics of Haor households (HH): 2010.

Village name*		V1	V2	V3	V4	V5
Number of HH	Total 292	41	42	74	14	121
Average age of HH head		44	42	41	39	42
Average size of HH		4.85	5.12	4.86	5.64	5.31
Gender of HH (%)	Male	13.70	13.36	23.97	4.45	39.04
	Female	0.34	1.03	1.37	0.34	2.40
Marital status of HH head (%)	Married	13.01	12.67	22.95	4.05	38.36
	Unmarried	0.68	1.03	1.03		1.37
	Divorce			0.34		
	Widow	0.34	0.34	1.03	0.34	1.71
	Others		0.34			
Education of HH head (%)	Primary level	4.79	5.14	8.90	0.34	14.73
	Secondary level	2.05	2.05	5.48		3.42
	Higher secondary level			1.03		0.68
	Degree level	0.34		0.68		0.34
	Uneducated	6.85	7.19	9.25	4.45	22.26
Crop cultivation land (average in decimal)		103.65	243.81	172.87	178.71	119.35
Vegetable cultivation land (average in decimal)		1.17	7.07	1.88	0.71	2.63
Poverty status of HH (money metrics) (%)	Non-poor	3.08	5.82	8.90	2.40	11.30
	Poor	4.79	4.11	6.16	0.68	9.59
	Very poor	6.16	4.45	10.27	1.71	20.55
Poverty status of HH (self perception) (%)	Poor	13.36	13.36	19.52	4.45	40.41
	Not poor	0.68	1.03	5.82	0.34	1.03
Number of earners per HH		1.27	1.45	1.26	1.21	1.30
Number of seasonal migrant per HH		0.24	.026	0.23	0.21	0.38

Source: Survey data; *V1-Chawrapara, V2-Chandpur, V3-Gaglajur, V4-Mohabbot Nagar and V5-Manderbari village.

household total income than the wet season income.

More than 52 to 73% of total income evolves from dry season activities. The amount of income provided by self-produced consumption is greater than income in kind. The household produces more and consequently consume more during dry season. The Haor villages' average per capita income is much lower than the national per capita income which is 43,433.80 (World Economic Output Database, 2010) in Taka. To sustain livelihood, Table 6 reports that the Haor households are engaged in diverse income activities both in dry and wet season. It was found that many households are simultaneously engaged in rice cultivation (63.87%); livestock rearing (34.23%) and wage labor (33.44%) activities. Mostly non-poor families have extra income from tending in-house livestock. The dry season income profoundly depends on precarious rice cultivation. Therefore, the amount of agricultural labor (seasonal contact labor) households is very low (6.64%), as compared to wage labor households. It may be because of salary of agricultural labor which is subject to a good harvest which is often vulnerable to concurrent flash floods. Information on homestead vegetable gardening and wet season livestock rearing, reveal the contributions of female member/s in the income flows of household. Lack of employment opportunities constrain wage laborious activities and consequently increase seasonal migration. The wage labor households decrease to 7.59% during the wet season. This category of people migrates for two to three months to the places where agricultural employments are available. The study finds that 29.09% households receive remittances during wet season whereas the figure is only 2.92% for the dry season. Normally, deluge brings fishing opportunities to the Haor people, but data on the table do not illustrate significance of the sector to the Haor livelihood diversification. That maybe true as

Table 5. The average household income of five villages (V) of Haor Area, Bangladesh, 2010.

	V-1	V-2	V-3	V-4	V-5
Crop season net income (%)					
Cash income (after deduction of production costs)	50.57	58.42	60.47	35.99	59.72
Kind income	2.44	1.54	2.42	0.48	3.00
Self consumption	10.26	13.23	8.88	17.01	5.54
Non-crop season net income (%)					
Cash income	24.40	17.55	19.40	32.14	29.16
Kind income	2.35	0.49	1.19	0.02	0.41
Self consumption	9.98	8.77	7.43	14.37	2.16
Total income of HH (A+B) (%)	100	100	100	100	100
Total income of villages (in Taka)	6,149,708	9,897,671	23,668,976	3,340,530	20,147,073
HH's average income in the V's (in Taka)	41,835	64,271	52,598	51,393	44,871
Per capita average income of V's (in Taka)	9,474	12,816	10,289	10,072	9,643

Source: Survey data

Table 6. Occupation structure of Haor households during crop and non-crop season, Bangladesh, 2010.

Crop season sources	HH (amount)	HH (%)	Non-crop season sources	HH (amount)	HH (%)
Rice cultivation	808	63.87	Boat renting	107	8.46
Livestock rearing	433	34.23	Livestock rearing	305	24.11
Forestry	54	4.27	Forestry	18	1.42
Fisheries	258	20.40	Fisheries	317	25.06
Vegetable cultivation	140	11.07	Market mediation	50	3.95
Homestead vegetable gardening	258	20.40	Homestead vegetable gardening	178	14.07
Agriculture labor	84	6.64	Boating	18	1.42
Wage labor	423	33.44	Wage labor	96	7.59
Artisan activities	40	3.16	Artisan activities	40	3.16
Hawking	2	0.16	Hawking	0	0.00
Construction	10	0.79	Construction	7	0.55
Transport	13	1.03	Transport	28	2.21
Hotel and restaurant	8	0.63	Hotel and restaurant	9	0.71
Business	222	17.55	Business	212	16.76
Services	59	4.66	Service	60	4.74
Religious activities	9	0.71	Religious activities	4	0.32
Village doctor	10	0.79	Village doctor	6	0.47
Cash from rent out land	27	2.13	Remittance	368	29.09
Remittance	37	2.92	Other activities	54	4.27
Other activities	77	6.09			

Source: Survey data

the majority of people are not allowed to access common water to fish. Table 6 reports that 20.40 and 25.06% households at dry and wet season respectively have income from fisheries.

These data confirm that, the portion population is a not typically major for the context of Bangladesh; however, the nature of the economic problem is distinct and has a merit for the consideration of an economic approach. As a result, this work will put its endeavors to explore and to look for a right approach for the development as suggested by Shaha and Thompson (2004), Sen (1999) and Alam et al. (2009).

The answers of the research questions and pertinent discussions

Economic development of the Haor livelihood is

challenging, which may be devised to supply multiple flows of income to the Haor people. In answering the questions which are outlined under research problem, it is found that the Haor people are always short of income. They are unable to use the capacity of productivity. The numerous reasons acting behind such problem are not pertaining to the subject of economics only but geographical, environmental, political and demographical concerns are related with the fact. Subsequently, attempts have been taken to unveil these findings.

The socio-demographic characteristics of the Haor archipelagos are: The answer to this question comes from the table of check lists containing the research questions and the tools of analysis. The method of answering these questions has been given on the second column of the second row (Table 3). The tools and the necessary data have been collected as they are found in the table of checklists. The results of socio-demographic characteristics of the Haor population have been obtained at both individual and household levels. The variables comprise of age, sex, family size, marital status, education and occupation in this discussion. These findings will be helpful to answer some other questions of this research.

In Haor population, 94.5% are males and 5.5% are female household heads. The major portion of male household heads is in the age range of 31 to 40 and covers 33.3%. For both sexes, 58.9% (26.4% for 20 to 30 and 32.5% for 31 to 40 age group) household head is in between the age group of 20 to 40 which has a strong implication in making decision in a family. The demographic evidence shows a diminishing trend in household head at the age of above 60. This may have association with family hierarchy, individual responsi-bilities for the family and the processes of individual's capital entitlement.

From the interviewed data, marital status, gender and age of household head variables are extracted. It was found that 95.3% of men and 25% of women households are married; 4.3% of men and 6.3% of women are unmarried and divorced respectively and 68.8% of women household heads are widows. A trend is traced out that teenage household head are rare in both sexes. They are not normally married before twenty. 55.8% men do marry within 20 to 40. Along with widows, another vulnerable group of women household is identified who are divorced and they are 6.3%. The widows are concen-trated more in their middle age though, data reports 12.5% women experience widowhood within an age group of 20 to 30.

The results of analyzing marital status with education and gender reveal that, 47.5% uneducated male and 25% uneducated female are married. The portion of unmarried men who have at least primary level of education is higher than the uneducated men. The inference is that, either educated men intend to be finan-cially solvent before marriage or incapable to engage in existing labor market to earn enough income to manage a married life. Data shows that divorce is zero among educated females. This means that education may protect them from becoming vulnerable and helps in retaining a good understanding of family livelihood in various ways. Most of the respondents are uneducated. This was expected for the people of the Haor area. During crop season 59.6 and 25.3% are farmers and daily labors respectively. Unemployed household head is 1.4% who are not engaged in income activities but holding the household head's position. Looking across educational qualification, it is found that 45.4, 33.9 and 17.2% farmer are uneducated, primary and secondary level of education respectively. In case of daily labor 16.1% are uneducated and 8.2% have primary education. In Haor area, 4.8% of the household's main occupation is business during crop season. Among which 2.1 and 1.4% are having primary and secondary level of education respectively.

At non-crop season, 25 and 22.9% are engaged in daily labor and fishing profession respectively. It was found that the seasonal migrants also reported as daily labor because, after migration they work in agriculture farm at destination for 2 to 3 months. The amount of daily labor remains same during both seasons. It may mean that this group of people has either limited resources to change occupation or are vulnerable to take any new occupation. Diversification of occupation was also reported, people change their occupation from farmer to fishing and business. Household heads doing business increases to 15.4% and among them 7.2% have primary education. The household head having degree level education are engaged in business in this season. Along with these information 27.1% household heads remain unemployed which is an indication of slacking labor market. These unemployed households are mostly farmer who consume their crop season savings at non-crop season which obstructs capital formation.

The aforestated findings reveal that physical capital, human capital, culture, shocks and seasonality are matter for the development of the Haor livelihood. All these capitals are required for cultivation, communication and business formation (Alam et al., 2009; Johsona and Lenartowicz, 1998). The young and middle age house-hold heads can earn more (Orr et al., 2009) as having higher productivity of labor. Education contributes in both social and economic development (Alam et al., 2009; Alam and Haque, 2010). Peoples' capabilities are influenced by associate culture (Gerring and Barresi, 2003) which enhance social capital (Knack and Keefer, 1997) and brings economic outcome (Guiso et al., 2006). Family size has negative and the number of earners has positive effect on the economic situation of households (Afsar, 2005) and at the same time both factors influence occupation mobility positively (Kuhn, 2005). Seasonality and shocks cause vulnerability, therefore the households consider different ex-ante and ex-post measures to sustain livelihood in rural Bangladesh (Azam and Imai,

2009).

The sources of income and the ways of managing that income: The answer to this question has come from Table 3 of check lists containing the research questions and the tools of analysis. The method of answering these questions has been given on the second column of the third row. The tools and the necessary data have been collected as they are found in the table of checklists.

Sources of income

There is a single crop region and agriculture is the main source of income. People never do animal husbandry for business purposes. Yet no such practice helps in increasing income. Cows and goats are sold out to get rid of difficulties. People never used to tending in-house chicken and duck for business purposes but seldom sold out. Now people are professionally doing duck-farming, selling eggs and ducks as well. Along with paddy cultivation, fishing also provides some extra income at crop season (*hemonta season*). Some people do fishing in the village river at ebb-tide and non-crop season (*borsha season*). Few people do market mediation of rice. The income sources are very rare during non-crop season. People migrate to *UZAN* (comparatively high rural agricultural land) now which was a social dogma in the past. People like to sell fish to make money than to share it among the neighbors, as it was the practice in the past. During winter, people do not cultivate green vegetables and other spring harvests as before. Vegetables were distributed to neighbors and relatives and were given to them as and when they asked for it. People used to share such types of income in the past. But now nothing is free. People live on lack of affection among them. The social ties become weak. Everybody sells everything of their produces to earn and yet run short in family management in terms of their family income.

Technology also assists to diversify income in various ways. Nowadays, the people of Haor earn through digital video and mobile telephones. Now threshing machine is around providing income to some people, along with tractor to plow land power pump engine is also available to hire for irrigation and home service of rice mill is offered. People are trying, migrating to other villages, towns and cities and by the way observing, experiencing and learning new ideas, new things and afterward using and implementing in the villages. Some like middle men do sell rice and dry fish. Neither everybody understands business nor has the capital to do business.

Management of income

The income being realized from all these sources mentioned earlier are used for household commitment. This does not allow for saving that can results to invest which eventually caused capital deficiency in the Haor area. The sources of income for crop and non-crop season with potential and national income sources illustrated in Table 7.

Among the people, 59.6% are farmer having income only from crop season and 25% are daily labor working both in crop and non-crop season. The tools of analysis identify that, the income is used mainly for consumption of basic needs. As part of household commitment the income is used for schooling of children, house renovation, and homestead construction. Health treatment takes a lion portion of the income along with payment of dowry. The low saving amounts sometimes invest to get mortgage of land and livestock to income further. Crop season earnings are used to cope with deluge when income opportunities for the majority of the population are marginalized.

The aforestated finding unfolds that, agriculture is the main source of income (Alam et al., 2009) which is subject to ecological factors (Orr et al., 2009; Nargis and Hossain, 2006; Ali, 1995). Higher returns evolved from non-farm sector are realized by the rural people of developing countries (Bryceson, 1999; Smith et al., 2001; Deichmann et al., 2009). Therefore, the occupational mobility increases gradually and people diverting land to invest in education and migration (Orr et al., 2009). Three decades back, social networks were very strong in rural Bangladesh (Malony, 1986) but these ties are almost absent now (Orr et al., 2009). For the social development, education is a useful instrument which consequently breeds economic development (Alam et al., 2009). In increasing income of the Haor people, the role of technology is required with education and skill to adopt and handle which is markedly identified by Alam (2009a) for the sustainable development of Bangladesh. Proper management of income provides capital formation for which financial training for the rural household heads would be instrumental for the sustainable development of the Haor people of Bangladesh

Interruptions on livelihood and the situation of the Haor households: The current livelihood is very onerous in the Haor area. The industrious labors are just incapable to increase their capacity of productivity. They have realization on the returns of their labor time that resource cannot be used because of loads of limitations. Both during crop and non-crop seasons, the livelihood is interrupted in various ways. Along with geographical difficulties, the demographic and environment factors often impede the flow of income. Lack of infrastructure, communication and transportation makes life very difficult. Cost of crop production, health treatment expenditure and price of basic goods increase which cause a drop in income. The mean size of family in the Haor area is 5.12 which is larger than the national average of 4.7 and the average number of earner is 1.41 and the household average inverse dependency ratio is 0.308 which is

Table 7. Different income sources of all the five villages of Haor and rural Bangladesh.

Current income sources		Potential income sources	National income sources
Crop season	Non-crop season	Cooperative fish culture	Agriculture
Rice cultivation	Boat renting	Individual in-net fish culture	Forestry
Livestock rearing	Livestock rearing	Pearl culture	Fisheries
Forestry	Forestry	Poultry farm	Agriculture labor
Fisheries	Fisheries	Dairy farm	Non-farm labor
Vegetable cultivation	Market mediating	Handicraft or handloom	Handloom
Homestead vegetable gardening	Homestead vegetable gardening	Large scale- oil seeds and pulse cultivation	Industry
Agricultural labor	Boating	Duck rearing	Business
Wage labor	Wage labor	Fish hatchling	Hawker
Artisan activities	Artisan activities	Teaching	Construction
Hawking	Restaurant	Tailoring training	Restaurant
Construction	Business	Tourism	Services
Transport	Religious activities	Large scale livestock rearing	Transport
Hotel & restaurant	Village doctor	Community based credit scheme	Trading
Business	Seasonal internal migration	Trading and market mediation	Remittance
Services	Services	Communication	Religious
Religious activities	Midwife, Quack	Mechanical plowing system	Rent out land
Village doctor		Incubating duck eggs	Midwife, Quack
Rent out land		Handloom	
Midwife, Quack		*Small scale fish processing enterprise*	

Source: Survey data

is low and noticed by the Haor people. They identified the gradual decrease of land–man ratio which interrupts livelihood. Such capital deficiency requires other supplementary sources of income for livelihood sustainability in the Haor area.

Flash flood is the single most natural calamity identified by the Haor people. It has both horizontal and vertical effects on the local livelihood and national economy. Data reveals that in every 5 years, flash flood affects the area at least one time which causes huge crop damage and interrupts livelihood's sustainability. As an environmental factor, deluge (*Borsha*) disparage livelihood by squeezing employment opportunities and increasing vulnerabilities. The people of Haor cannot cultivate cereal and vegetable. High wave storms often causes household damage, homestead erosion, constrain fishing and other market mediation activities. The Haor people cannot move anytime, to anywhere they need to go as boat service is the only means of transportation and not available throughout the day. Livestock food and fire wood cannot be collected. Children are at risk of water harrier and often not sent to schools.

The economic development of rural livelihood have positive links to infrastructures (roads, irrigation facilities, electricity), the accessibility of those households to other infrastructures (growth centers, educational institutions, health services etc.) (Kam et al. 2005) and geographical location of the area (Rahman, 2009). The infrastructure facilities enhance household capabilities of earnings, reduce transportation costs and increase the price of farmers' produces (Wanmali and Islam, 1997). The link of family, family size and development is imbedded in social norms (Becker, 1988; Palivos, 2001). The families which are less altruistic and who are poor in bequest tend to invest less in children and social norms influence greatly the degree of underinvestment. Thus, the family size, linking generations, are the major sources of children assets and human capital which regress or progress the abilities and endowments of children (Becker, 1988).

The flash flood exacerbates substantially the process of development. In 2004, 30696 families (154,370 people) were affected by early flash flood in two sub-districts (Mohangonj and Khaliajuri) of Netrokona district. 75% of crops were damaged, to meet monetary needs 25 to 40% of the livestock has been sold at 60 to 70% of the actual price, people face inaccessibility to credit opportunity, labor market squeezed to the margin (Disaster Emergency Response (DER) Secretariat reports, 2004). This had negative effect on wages (Banerjee, 2007). Such natural disaster impedes collecting natural fodder which discourages livestock rearing (Orr et al., 2009) in rural Bangladesh.

The local resources can help to overcome people's predicament: Generally, the underprivileged area has limited resources with loads of limitations where the Haor area is indifferent. The answer of this question is inconclusive because resource-man ratio is difficult to quantify. But the method which is cited (Table 3) in column two and row five will be instrumental to analyze the problem with the proposed tools. The census survey provides information of income accrued from different assets. Physical resources (e.g. hand trolley, boat, livestock, number of earners), human capital (education, artisan activities), financial capital (e.g. having credit from local money lender), social capital (e.g. in-kind income) stimulate income and extend labor market. Information gathered through interview result that, the Haor people earn from land, water, bio-diversity, reed forest which are all natural resources of the Haor area. Both interview and focus group discussions reveal that, along with basic infrastructure facilities education also matter to increase income in the villages. People try in various ways to increase income but cannot get rid of necessities.

The local resources alone would not be the base of economic development of rural livelihood in the developing countries (Ellis, 2003; Bird and Shepherd, 2003). Being uneducated and unskilled rural poor are naturally involved in low wage residual employment (Saha, 2002). Endowment of natural capital advocates development by shifting of capacity (Rahman, 2002) but such reformation is subject to some other exogenous and endogenous factors.

The governmental steps to better Haor people's socio-economic condition: Government needs to put enabling environment in place, such as provision of infrastructure facilities and good policies and effective regulatory framework in the Haor area. All these three factors boost investment and promote development. Policies cover capital accumulation and investment climate in the Haor area and extension of goods and labor market for the Haor people. Interviews, focus group discussions and key informant interviews are the three instruments used to understand and unveil the guidelines of the Haor livelihood development. They are: the Haor dikes should be well constructed and altitude should be alleviated; the river should be silted out by proper dredging; common water should be open for all; year round roads communication and public transportation facilities should be provided; labor market should be extended for both crop and non-crop season; homestead protection wall should be constructed; public financial institution should be established and accessible and medical treatment facilities and higher educational institution are required.

The notion of economic development of the Haor area has taken place on humanitarian aspects. The aggregate contributions of the five Haor villages to the national economy is tabled (Table 8) which is a very little amount (0.001855%) and do not promote undertaking rigorous developmental steps for the Haor people as a whole. The village average per capita income is less than one quarter from the national per capita income. So empirically investment for doubling the Haor household's income would not be considered a solution which is economically viable for the nation. But for the great benefit of the country, humanitarian ground of development (mentioned under development on humanitarian grounds) cannot be neglected. Rather, it is required to take necessary commensurate steps to increase the well being of that underprivileged area.

The prescribed guidelines given by the Haor people are implicitly/explicitly connected to entitlement of capital through which capabilities will be increased and consequently economic development will be achieved. On this front, education can play the first and the best role (Alam, 2009b) which may help in agricultural activities, communication and business formation (Alam et al., 2009). Human capital helps farmers to increase productivity of land and diversify crop cultivation and encourage new technology adoption. By providing science and technology based education, the skills and productivity of Bangladesh's population must be increased to achieve sustainable development (Alam, 2010a, 2009a). Establishment of such institution is required for amendment of education policy (Alam, 2009b) and good governance and new method of monitoring is essential to control over the quality and corruption of education sector (Alam, 2009b; Alam et al., 2009).

In agricultural intensification, the role of education is pervasive (Alam et al., 2009). Along with this, population also plays the major role in crop production. Increasing family size decreasing the farm size, thus agricultural organization is going to be limited to small and selective arable land in Haor area. The effect of organization inhibit the adoption of new technology, therefore impedes agricultural intensification (Mendola, 2008; Sly, 1972). Intensifying agriculture sector extends labor market in the Hoar area. In this spread effect technology works as a mediator factor which may help to create more distribution channels [Agriculture (A) — New Technology (T) —New Employment (NE)] and establish a large sustenance organization for potential support to increase income by diversifying livelihood in the Haor area. Livelihood diversification not only increases the income of rural people but also reduces the year round income fluctuation (Mendola, 2008; Saha, 2002). It improves the ability to manage risk and consumption more smoothly across season (Azam and Imai, 2009; Toufique, 2002). To save the single crop from flash flood, extend labor market during crop and non-crop season, increase communication, transportation and utility services some structural transformation programs are essential to initiate. A special budget should be allocated for the implementation purpose. Individual regulation on control must be ensured the transparency and efficiency of the local government system (Alam et al., 2009; Alam et al., 2010). Both formal and informal institutions should work

Table 8. Population and national income share of all the five villages of Haor, Bangladesh, 2010.

Population of Bangladesh [a]	Population in all Haor districts [b]	Population in study villages under Netrokona district [b]	National per capita income (LCU CP) [c]	Village per capita income (average) (LCU)	Total income of villages (LCU)	HH average income of villages (LCU)	Share of average income with national GDP(%) [d]
156,118,464	N-971,197	636(V1) [e]	43,433.80	9,474	6,149,708	41,835	0.000180
	S-977,060	774(V2) [e]		12,816	9,897,671	64,271	0.000290
	H-864,645	2,200(V3 and V4) [e]		10,289	23,668,976	52,598	0.000694
	K-1,274,837			10,072 (V4)	3,340,530	51,393	0.000009
	M-791,688	1,884(V5) [e]		9,643	20,147,073	44,871	0.000591

Sources: a) US Census Bureau, 2010. b) BBS, 2001. c) World Economic Outlook Database, 2010. d) The World Bank Data Base, 2010 (considered GDP- constant LCU of 2009). e) Village name -V1-Chawrapara, V2-Chandpur, V3-Gaglajur, V4-Mohabbotnagar and V5-Manderbari village. Abbreviation: HH- Household. N-Netrokona, S-Sunamgonj, H-Hobigon, K-Kisorgonj, M-Moulovibazar. LCU-Local Currency Unit and CP-Current Price.

in a relationship of complementary and substitution of each other in the rural area of developing countries (Islam, 2004). Decentralization makes local institution effective and makes association strong with informal rural institution. Thus, social capital and welfare of rural households increase in the developing countries (Grootaert and Narayan, 2004). To handle the effects of natural calamity in the underprivileged area a strong and functional local government is essential. Informal rural institutions (such as *Somaj, Shalish*) promote household's capacity, protect from vulnerability and provide security. Membership of any village clubs offers social capital in rural area of developing country (Bird and Shepherd, 2003). In Haor area of Bangladesh, social clubs supply financial capital during both crop and non-crop season. Social networks provide priority in borrowing and lending.

The local formal institution can provide agricultural education services, technical support and information to the farmer which may welcome adoption of modern agricultural technology. The village educational formal institution can play a role by providing lesson on agriculture (Alam et al., 2009). Even the Imam's of mosque can play an influential role on agricultural education services. Formal and informal institution can work together to conserve the common resources. Such types of resources are important to create investment environment. So exploitation taxes should be charged by the formal institutions. Along with technology, institutional arrangement will have a long term impact on the price of produces in the rural area of developing country.

Conclusion

Both theoretically and empirically, it is justified that development is a continual process of progress which has many alternative ways to follow. In this case target area's relevant factors are always given priority. In this research an economic approach for the development of Haor area is discussed elaborately. Taken the reality in consideration, the research attempts to answer some questions. Results show that, the industrious people of the Haor area are doing agricultural activities, though precarious, and side by side delving out various income generating activities to sustain livelihood. With little income, they try to manage family and holding intention to accumulate, as they are aware of capitals accruing advantages.

For the limitation of land and resources, the economic development approach would be the appropriate technique to adopt to develop Haor livelihood. The research identifies that, government should take up major development plan and concomitantly private affords to put things in place. To get desirable outcome from those steps, some new but pertinent policies are required. They are modernization and intensification of agriculture sector, blending education with new technology with a priority on agricultural research. Immediately some infrastructures (e.g. the Haor dikes) developments have to accomplish to protect crops from early flash flood. To encourage investment creating favorable environment is critical and at the same time to attract investment in the Haor area government can offer some facilities like- tax exemption, special investment loan, health, transport, communication, law and order facilities to those investors. Necessary policies are required to increase the capabilities and capital of the Haor people, who will be one of the factors of production of those industries.

To achieve such objective, strong rural informal institution and reformation of rural formal institution are essential. It is already realized from the previous experiences that economic development would not be possible without a decentralized government system and good governance. Need-based analysis strategy would be an instrument to bring fruitful outcome of development. In a nut shell, mass participation, responsibility of the Haor people must be ensured for overall development failing which objectives will not be overcome.

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