*Full Length Research Paper*

# What offers solution to the poverty reduction of the Haor people in Bangladesh? Seasonal migration or a new inshore economic livelihood policy

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**Researches from different disciplines are yet to provide a concrete standpoint on causal relationship between poverty and migration. With a market driven attitude, seasonal migration has been increasing dramatically with a hope to reduce the poverty. So far, research has not confirmed if migration helps to reduce poverty or poverty is forced to be migrated. Whatever the fact, it would be realistic that the local community will not migrate if they find better work opportunities with higher productivity for their livings. In this paper, an effort is made to discover the possible ways to make the local community in the Haor area to be productive, ensuring their stay in their homes. A development economic policy guideline is aimed to be provided in order to make the possible ways functional. Along drawing individual and household profile of migrant, a mixed method suggests that some interventions of food stamp, infrastructure facilities and cooperative activities are necessary for in-situ socio-economic development of the Haor people. The outcomes of the study are reliable to apply in underprivileged ecological areas in other developing countries alike.**

**Key words:** Poverty, flood, seasonal domestic migration, Haor, livelihood, development policies.

## INTRODUCTION

Keeping poverty reduction as a key strategy, development policy in most of the developing nations is formulated, which is constrained by geographical remoteness (Reardon, 1997; Waddington and Sabates-Wheeler, 2003) and isolation from the growth center (Bird and Shepherd, 2003). In addition to these, the development activities that are guided by the constraint policies are also obstructed by many factors such as investment environment, input-output price and complexity of under-privileged area where the most seasonal labor migrants[1] of the world live. In these challenging situations, the poor people assign different livelihood strategies (for example, seasonal migration) which often work against development since such migrants exert threats on social and economic stability.

The poor are always run in short of capitals to overcome vulnerabilities. In case of seasonal migrants,

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[1]They assign short period of migration. People do so because of crop seasonality, seasonal food crisis, etc. which is a pervasive livelihood diversification strategy for the most of poor in the developing countries (Rabby et al., 2010).

livelihoods are vulnerable to different latent factors (for example, exploitation, health hazard, etc.) at destination. Therefore, migrants may fail to become potential labor with their intrinsic capability at destination. Along with this, some ecological factors (such as flash flood, long deluge) hinder their income at the place of home. This issue demands scholars' attention in the field of development economics. Seasonal domestic[2] migration in the flood prone developing countries is sometimes very drastic and increases the importance to examine the impact of such type of livelihood strategy to the poverty status of the migrant household.

Considering the aforementioned income constraints, the flood prone and poverty related seasonal migration issue requires commensurate contextual exposition. The study focuses on livelihood in the Haor[3] area in North-eastern Bangladesh. The Haor area is a poverty stricken, geographically remote and environmentally sensitive region. To sustain livelihood, the people of the Haor area seek employments elsewhere and become seasonal domestic migrant in Bangladesh. Undertaking this type of livelihood strategy is also subject to individual and household factors. This study is an attempt to find suitable livelihood diversification strategies and policies which may be instrumental for the socio-economic development of the Haor households'.

## Research problem

Household's income in the Haor area is subject to some controlled, semi-controlled and uncontrolled factors (Rabby et al., 2011). Floods, remoteness, infrastructure facilities are also important factors influence household's income in rural Bangladesh (Kam et al., 2005; Davis, 2007; Banerjee, 2007; Shahabuddin, 2004). Along with these constraints, population pressure increases the landless household in the Haor area (Khan and Islam, 2005). The main income of the Haor households is based on single crop cultivation and relevant activities. This crop is subject to ecological, geographical and environmental attributes of the Haor area. Specifically, flash floods, hail storms and dry weather cause crop damage. The people work hard during crop season and try to save to sustain livelihoods during non-crop season which is 5 to 6 months deluge which also obstructs livelihood in many ways. During deluge, the labor market becomes visibly absent, the people do not have access to infrastructures and resources, as a result, their livelihoods gradually become difficult (Rabby et al., 2011).

Therefore, the people of these underprivileged areas are undertaking various livelihood diversification strategies to overcome crisis. On this front, they assign seasonal migration as a last resort which is also constraint by in-capabilities of household and migrant (Rabby et al., 2010, 2011).

## Research aim and questions

Seasonal-domestic-migration may simply be shown as a temporary solution of the problem; likewise, taking a pain killer or throwing the head does not offer a real solution to headache. Considering this attitude, the study aims to look for development policies pursue new livelihood strategies for the reduction of poverty in the Haor area of Bangladesh.

Despite producing 20% of the country's staple food and hundreds of thousands of sweet water fish for the local and international market, the livelihoods in the Haor areas are onerous. Therefore, the questions of this research are:

1. Who are the migrant?
2. Why do they migrate?
3. How does this strategy affect household poverty status?
4. Is there any need for new policy?
5. Can the new policy help to resolve the migration and improve the poverty status?

## Conceptual framework

### Understanding flood-induced seasonal migration

Two ecological attributes, both inextricably intertwined, underpin the seasonal diaspora in the Haor area of Bangladesh - flooding and crop seasonality. The seasonal deluge which lasts 5 to 6 months negates a second cropping cycle with all the subsidiary work opportunities for the community. For the marginal Haor households, seasonal migration is a grounded coping strategy (Mishra, 2007) to deal with an inevitable environmental and ecological disaster or vulnerability (Rhyhan and Grote, 2007; Kabir et al., 2008). Since seasonal floods disrupt the traditional means of livelihood, the seasonal migration strategy works as an adjustment mechanism[4] for the poor households. Figure 1 illustrates the phenomenon of flood induced seasonal migration.

The attribute 'duration of flood' induces poor people to seasonally migrate as the duration of flooding intensifies their sufferings. Another attribute 'production cycle and

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[2] Domestic means the incident occurs within the geographical frontier of a nation (Rabby et al., 2010).
[3] Haor is a low lying, bowl shaped flood plain originated from the tectonic depression. This wet land 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 (Rabby et al., 2011).

[4] Adjustment mechanism includes strategies of reducing household current food consumption during crisis, shifting to less preferred foods with lower cash cost and reallocating household labor to increase current income (Rasid et al., 2008).
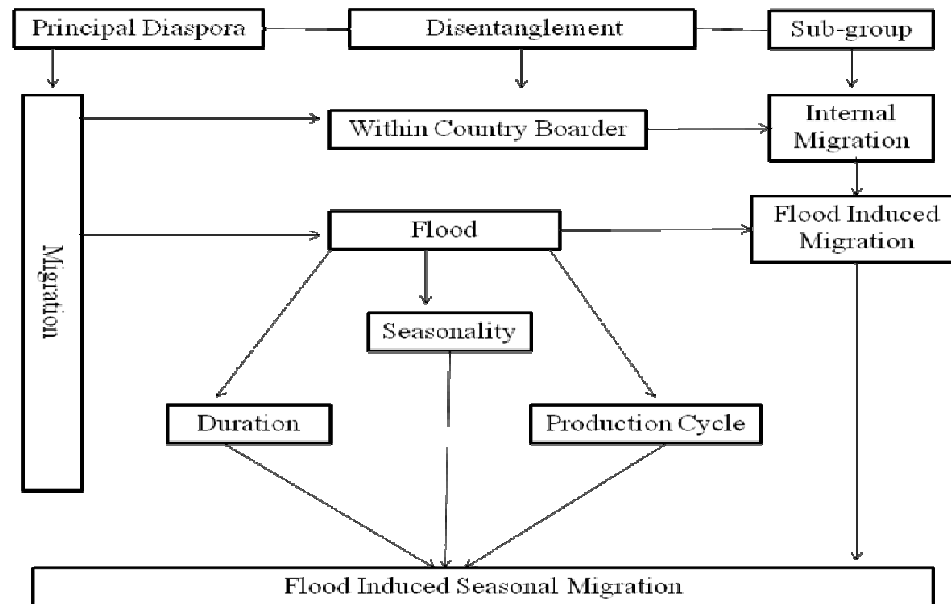
**Figure 1.** An illustration of flood induced seasonal migration.

flood' relates to the disruption of production and services of the agricultural ecosystem. As theory posits that ecology can be instrumental in enhancing livelihoods, ecological management becomes a critical component of poverty alleviation strategies (DeClerk et al., 2006). However, poor ecological management[5] (particularly in resource-poor countries like Bangladesh) severely diminishes the income diversification alternatives forcing the poor and marginal inhabitants to adopt seasonal migration as their coping mechanism.

## Linkage between poverty and seasonal migration

The poverty-migration nexus can best be understood through its multidimensional attributes (Kothari, 2002). Studies by Stark et al. (2009), Skeldon (2003), De Haan and Yaqub (2008) and Afsar (2005) attribute it to the predominance of economic factors (for example, unemployment, wage determinants) as migration can move people out of poverty or into poverty or greater impoverishment. Based on this hypothesis, identifying migrants and the causes and consequences of migration can unravel the complexity of this nexus (De Haan and Yaqub, 2008; Kothari, 2002).

## Identifying the migrant

Seasonal migrants generally comprise the young able-bodied males and a select group rich in human and social

capital (De Brauw and Harigaya, 2007). Asset endowment provides a comparative advantage to diversify livelihoods elsewhere than the point of origin. As the poor are also asset deficient, they are highly cost sensitive in adopting any livelihood diversification strategies. In geographically vulnerable areas, the very poor undertake seasonal migration (Mosse et al., 2002). In Bangladesh, Afsar (2000, 2005) reports that migrants belong largely to two groups – the landless and the resource rich households while De Haan et al. (2000) observe that internal migrants are less likely to belong to landless households. The poorest people prefer temporary and short duration migration while landless households rarely migrate unless survival becomes difficult in rural Bangladesh (Rayhan and Gorte, 2007). Such inconclusive findings necessitate further explorations of the seasonal migrant's identity particularly in the Haor area of Bangladesh.

## Causes of migration

Migration is an *ex ante* risk management strategy or *ex post* coping strategy (Barrett et al., 2001). It is a flight from poverty when there are no locally available opportunities for survival (Skeldon, 2003). People often migrate responding to diminishing returns to labor or land and non-existent land, labor, credit or insurance markets (Barrett et al., 2001).

Migration theories imply that migration is induced by wage differentials between the origin and destination, underemployment of agricultural labor, and unemployment. The poor household head migrates to cope with a lean season (Sjaasted, 1962) and to service debt (Mosse et al., 2002). The level of access to and control over

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[5] It causes over exploitation and degrades the natural growth processes of the ecosystem.

human, social, cultural, political, economic and environmental capital, causes migration (Kothari, 2002). These causes connect to poverty as the poverty-migration link is inconclusive (Afsar, 2005).

In rural Bangladesh, poverty can induce migration in diverse ways: chronic unemployment shortage and limited land ownership (Afsar, 2005; Shamsuddin, 1981; Kabir et al., 2008; Shonchoy, 2008), gender disparities (Afsar, 2005), ecological vulnerabilities (Afsar 2005; Kabir et al., 2008; Shahariar et al., 2006; Shonchoy, 2008) and household and individual characteristics (Shahariar et al., 2006; Shonchoy, 2008). Lack of social networks (Gardener and Ahmed, 2006; Kabir et al., 2008; Rayhan and Gorte, 2007), inaccessibility to resources (Chowhury and Rasid, 2004; Alam, 2004), infrastructure and credit markets and natural calamities (for example, annual flood) (Rayhan and Gorte, 2007) may also induce seasonal migration in rural Bangladesh. But specifically in the Haor area, despite the aforementioned reasons, frequent flash flood (DER Secretariat-Ministry of Food and Disaster Management, Government of Bangladesh 2004) and annual deluge[6] (Gardener and Ahmed, 2006) impel seasonal migration.

### Consequences of migration

The inconclusive findings on the poverty-migration nexus and flood-induced seasonal migration require investigation. In general, when people are forced to relocate then migration can lead to an increase in the number of absolute poor and again when migrants are selective of having human and social capital then migration also leads to an extension of poverty in a community or region (Skeldon, 2003) through capitals (for example, knowledge, skill, experiences, financial investment, etc.) relocation. Migration, as a last resort, leads to further exploitation and impoverishment and accentuates the vulnerability rooted on such comparative disadvantages as capital deficiencies and inaccessibility to credit markets. Migrants borrow at high interest rates to fund seasonal moving costs and living expense exacerbating individual and household poverty and vulnerability as family left behind depend on remittance transfers (Wood, 2003).

Flood-induced seasonal migration exacerbates poverty when migration itself is a source of vulnerability. Seasonal migrants dependent on manual labour are vulnerable to health hazards (Deshingkar and Start, 2003; Rafique et al., 2003, 2006), insecurity on the journey and employees' malpractices (Rafique et al., 2003, 2006). Flood induced migration acts as a form of credit and recovers

values of damage caused by flood. Recurrent seasonal floods like those inundating the Haor area, can over time, significantly increase the number of homeless, landless and temporary migrants while pushing them deeper into the poverty trap (Rayhan and Gorte, 2007).

### The Haor people's livelihood in Bangladesh: Socio-economic issues

Seasonal flood-induced migration is not a viable solution for the poor to achieve sustainable livelihood (Shonchoy, 2008; Shahriar et al., 2006; Kabir et al., 2008) when they are also subject to environmental crisis (for example, crop failure, flood, river erosion, etc.), monga[7] and poor social protection. But several studies (Shonchoy, 2008; Kabir et al., 2008) have not considered poverty or ecological parameters in examining seasonal domestic migration.

While Shaharia's (2006) study incorporated economic factors, ecological vulnerability and migrants' personal attributes in affecting the seasonal migrating decision, it overlooked the impact of remittance in providing capital to diversify livelihoods.Seasonal migrants are neither uniquely distributed nor inherently homogenous in character. Gender-specific constraints, unequal employment access, low educational attainment rates, natural resource constraints and the unremitting struggle to escape poverty are fundamentally and directly or indirectly associated with the Haor households' livelihood diversification strategies (Rabby et al., 2011; Alam, 2004).

The seasonal migration consequences of both time variant (e.g., household size) and invariant characteristics (for example, gender of migrant) of households together with crop seasonality patterns based on the Haor ecological conditions influence the decision to seasonally migrate. Crop seasonality and migration are together subsequently related to household income in rural Bangladesh (Shamsuddin, 1981; Rasid et al., 2008).

Despite cultivating a single crop and the recurrence of flash floods, the Haor region produces about 20% of country's total staple food, covers almost one fifth of its total land area and provides livelihood for twenty million people. Along with rice and land taxes, the area provides millions of tons of sweet water fish for local and international markets. Yet, ironically, the region is still underdeveloped and during the annual deluge, neither public nor private interventions have been made to extend employment opportunities let alone social investments.

The flood-induced seasonal migration and poverty interface remains a poorly researched and often

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[6] This typical climatic character of the Haor area differs from the usual understanding of annual flood. Deluge is not an unusual and unexpected ecological incidence in the Haor area. But its inherent attributes of consistent annual reoccurrences, seasonality and long duration make differential from annual flood.

[7] It is seasonal food insecurity in ecologically vulnerable and economically weak parts of Northwestern Bangladesh, primarily caused by unemployment and income deficit before monsoon crop is harvested. It mainly affects those rural poor, who have an undiversified income that is directly or indirectly based on agriculture (Zug, 2006).

**Table 1.** Poverty line table.

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

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

**Table 2.** Distribution of sample in the five Haor villages.

| Poverty status | Village name | | | | | Total |
|---|---|---|---|---|---|---|
| | V1 | V2 | V3 | V4 | V5 | |
| Non poor | 31 | 60 | 126 | 18 | 113 | 348 |
| Moderate poor | 46 | 47 | 117 | 27 | 115 | 352 |
| Very poor | 70 | 47 | 207 | 20 | 221 | 565 |
| Total | 147 | 154 | 450 | 65 | 449 | 1265 |

V1- Chawrapara, V2-Chandpur, V3-Gaglajur, V4- Mohabbotnagar and V5-Manderbari village.

misunderstood area in Bangladesh. A viable framework is required incorporating the primary determinants of seasonal domestic migration in the poor and flood prone Haor areas to generate sustainable livelihood diversification policies and strategies for the socio-economic development of the Haor households.

**MATERIALS AND METHODS**

The study area is chosen based on the poverty incidence map at the district (Zila) and sub-district levels (Upazila). More than 50% of the study village households do not have any cultivable land and 45% at the sub-sub-district level (Union) (BBS, 2001), indicating the prevalence of poverty. Data collection followed a three stage sampling process to increase data reliability and accuracy.

**Stage 1**

To identify the poor and migrant households, a household census survey of the five villages collected household income, expenditure, remittances, family size and household head occupation data. Then, the upper income poverty line (Table 1) for 2008 was calculated to categorize poor and non-poor households. Also, using a calculated lower poverty line (Table 1), extremely poor households were identified from among the poor group.

***Poverty line calculation***

In calculating the 2008 poverty line, the ratio of the 2008 rural consumer price index (RCPI) to that of 1998 was calculated and multiplied by the 1998 poverty income line to obtain the updated 2008 poverty line shown in Table 1. The 1265 households so estimated were categorized into three different groups according to

poverty status; their distribution in the five villages is given in Table 2.

***Significance of samples and analytical design***

Structured and semi-structured interviews were conducted along with the census survey. Questionnaires, focus group discussions and key informant interviews were the main instruments used. A checklist of the research questions and tools of analysis are given in Table 3 to rule out inconsistencies in the data collected.

**Stage 2**

In selecting a representative sub-sample of each sample, the Krejcie and Morgan (1970) suggestion was followed[8]. With the confirmed equal weight of each category in each village, a random sample of 292 households was selected (Table 4). After this, interviews were administered with structured and semi-structured questionnaires. From the collected information, households were again categorized into two groups - poor and not-poor according to their self perception[9].

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[8] 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).

[9] Following Sabates-Wheeler et al., (2005, 2008), to get the out-come of the poverty status the question is to be asked, is the financial situation of the household insufficient, barely sufficient, sufficient and more than sufficient to buy all the basic needs? Information obtain from these four categories have to be re-categorized into two for estimation purposes: poor (using insufficient and barely sufficient income) and not poor (using sufficient and more than sufficient income).

**Table 3.** Checklist of research questions and analytical tools.

| Research questions | Method/s | Tools | Sample |
|---|---|---|---|
| Who are the migrant? | Quantitative | Census survey | Yes |
| Why do they migrate? | Qualitative | Census survey; structure, semi-structure and key informant interviews | Yes |
| How does this strategy affect household poverty status? | Quantitative | Census survey; structure and semi-structure interviews | Yes |
| Is there any need for new policy? | Qualitative | Focus group discussions | Yes |
| Can the new policy help to resolve the migration and improve the poverty status? | Quantitative | Simulation | No |

**Table 4.** Distribution of sub-sample in the five Haor villages.

| Poverty status | Village name | | | | | Total |
|---|---|---|---|---|---|---|
| | V1 | V2 | V3 | V4 | V5 | |
| Non poor | 7 | 14 | 29 | 4 | 26 | 80 |
| Moderate poor | 11 | 11 | 27 | 6 | 26 | 81 |
| Very poor | 16 | 11 | 48 | 5 | 51 | 131 |
| Total | 34 | 36 | 104 | 15 | 103 | 292 |

V1- Chawrapara, V2-Chandpur, V3-Gaglajur, V4- Mohabbotnagar and V5-Manderbari village.

## Stage 3

For an in-depth analysis, the study used focus group discussions to discover the vertical impact of seasonal domestic migration on the Haor livelihoods. The migrant households were identified by such attributes as gender, education and occupation of household head. In this process, 5 groups each comprising 5 members (total 25 households) were selected. Though the discussions were open, the respondents were encouraged to raise issues not purposely intro-duced for further clarification and deeper consideration.

## Method

The study's main objective is to explore the effects of flood-induced seasonal domestic migration ($M_h$) on household poverty (income poverty) status ($P_{hs}$). Therefore, the relationship to be established lies in the understanding of the poverty-migration linkage. Given the agricultural, ecological and geographical characteristics of the Haor area, it is assumed that labor works in the area during dry (crop) season and migrates during flood season (deluge). Consequently, the effect of migration on poverty is explored by a) dry season income and household resources, b) mediating factors, and c) some other time variant and invariant factors.

The dry season income ($D_i$) and household natural resource factors ($H_r$) affect both household head's propensity to migrate and poverty. Similarly, the interceding factor affects any new livelihood strategy and the household's poverty status. As both migration and poverty related to a 'cause' and 'effect' relationship, it can be stochastically determined from the following functions as:

$$P_{hs} = f(D_i, M_h, H_r, X_{vh}) \ldots \ldots \ldots \ldots (1)$$

In this function, $H_r$ and $X_{vh}$ mean natural capital ($Land_{mh}$) of the migrant household and human capital such as education level ($EDE_{hh}$) of the household head.

The Haor people migrate to other agricultural regions when their *in situ* livelihoods fail during the flood season (Gardener and Ahmed, 2006), the probability of migration is inversely related with the income at origin (Hay, 1980) while the decision to undertake seasonal domestic migration depends on the financial capital, investment attitude and return on investment (Rabby et al., 2010). Livelihood diversification opportunities are purely marginal and largely unavailable during flooding. The financial capital to invest is subject to high risk, because of ecological vulnerability, high commodity price fluctuations, exploitation and some institutional constraints. Further, poverty and livelihood studies (e.g., Kotari, 2002; Ellis, 2003; Rabby *et al.* 2010) posit that the poor are financially poor as well. Thus, livelihood diversification strategies in the Haor area are highly depended on the size of the dry season income. Therefore, the household's migration probability function is:

$$M_h = f(D_i, H_r, X_{vh}, X_{im}, X_{vm}, I_f) \ldots \ldots \ldots \ldots (2)$$

Here, $X_{vh}$ is household size ($HH_{size}$), $X_{im}$ gender ($GEN_m$), $X_{vm}$ age of migrant ($AGE_m$) and $I_f$ represents an interacting factor between natural capital and dry season income ($Land_{mh_{D_i}}$).

The household size and age are time variant while gender is a time invariant factor. In function (2), neither the cost of migration nor the discount rate is included as they are assumed to be the same for all potential migrants. It is more factual in understanding the matter as all the potential out-migrants originate from a

homogenous geographical area and migrate to the same set of alternative destinations (to either Comilla or Chittagong or Dhaka district). After separating (loading down) group variables into individual attributes to the function (1) and (2), they can be written linearly as structural equations:

$$P_{hs} = \alpha + \alpha_1 D_i + \alpha_2 M_h + \alpha_3 Land_{mh} + \alpha_4 EDE_{hh} + \mu_p \ldots \ldots \ldots (3)$$

$$M_h = \beta + \beta_1 D_i + \beta_2 Land_{mh} + \beta_3 HH_{size} + \beta_4 GEN_m + \beta_5 AGE_m + \beta_6 Land_{mh_{D_i}} + \mu_m \ldots (4)$$

Equation (3) can be estimated directly through a linearly reduced form of poverty status function. Therefore, a new equation is developed which is:

$$P_{hs} = \delta + \delta_1 D_i + \delta_2 Land_{mh} + \delta_3 EDE_{hh} + \delta_4 HH_{size} + \delta_5 GEN_m + \delta_6 AGE_m + \delta_7 Land_{mh_{D_i}} + \varepsilon_p \ldots \ldots \ldots (5)$$

Nevertheless, it is logical to assume that equation (5) may produce a biased estimation, since $\varepsilon_p = \mu_p + \alpha_2 \mu_m$. Therefore, there is a possibility of omitting unobserved variables/s hence introducing as endogeneity bias[10]. To resolve this endogeneity bias, the Hausman error test was performed as follows[11]: The probability of endogeneity in the reduced form of equation which needs to regress first is:

$$M_h = \pi + \pi_1 D_i + \pi_2 Land_{mh} + \pi_3 EDE_{hh} + \pi_4 HH_{size} + \pi_5 GEN_m + \pi_6 AGE_m + \pi_7 Land_{mh_{D_i}} + \pi_m \ldots \ldots (6)$$

And in the second stage, the equation is considered to regress is:

$$P_{hs} = \gamma + \gamma_1 D_i + \gamma_2 Land_{mh} + \gamma_3 EDE_{hh} + \gamma_4 HH_{size} + \gamma_5 GEN_m + \gamma_6 AGE_m + \gamma_7 Land_{mh_{D_i}} + \gamma_8 \pi_m + \vartheta_p \ldots \ldots (7)$$

Here, $P_{hs}$ is poverty, $M_h$ is seasonal domestic migration and $\pi_m$ is the calculated residual retrieved from equation (6) and $\vartheta_p$ is the error term.

### Significance of using structural equation modeling (SEM)

In quantitative research, the use of SEM is increasing more rapidly than the other models like- multiple regression, multilevel models, general equilibrium models etc. Although, like other models, SEM is based on regression analysis principles, it is more advanced in solving both substantive and statistical problems that other traditional models cannot handle (Muijs, 2004). In explaining the causal relationships among dependent variable and predictors, multiple regression and multilevel models are less advanced in revealing of the direct and indirect effects.

Another reason for using SEM is the inherent measurement error issue especially when using questionnaires to gather data. In other regression procedures, this error is overlooked by assuming that the data are accurate. But as SEM takes this measurement error into the analysis, relationships among variables that cannot be directly observed (constructs) are not biased by measurement error. Thus, the actual relationships between variables are highly reliable (Wener and Schermelleh-Engle, 2009; Muijs, 2004).

Social science theories postulate that variables (irrespective of dimension, conditions and group) have complex relationships. Modeling out and testing complex patterns of relationships can be facilitated by SEM. This would necessitate several separate analyses in other regression procedures (Wener and Schermelleh-Engle, 2009).

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[10] Mandola (2008); Sabates-Wheeler et al. (2005, 2008)
[11] Gujarati (2003)

## FINDINGS AND DISCUSSION

In answering the research questions, most of the Haor people suffer extreme poverty and are always short of income and are unable to be gainfully productive because of such ecological attributes as the annual deluge, recurrence of flash floods, poor crops, etc. Thus, the Haor people are forced to search for their livelihoods elsewhere. The following sections attempt to identify the migrants, causes of migration and the poverty-migration linkage.

### The attributes of migrants and their households

In this study, the migrants are those people who are the victims of the annual deluge and recurrent flash floods in the Haor area. Households with very limited income diversification opportunities, inaccessible to credit markets and natural resources undertake seasonal migration. Northwestern Bangladesh, though different from the Haor area, displays similar attributes for its migrant households (Kabir et al., 2008; Shonchoy, 2008; Shahriar et al., 2006).

### Migrant households

A total of 88 households (seasonal migrant households), comprise at least one member who migrates for a short period domestically during the non-crop deluge period. Table 5 depicts the education level of migrant household head (MHH), land ownership of MH and poverty status of MH.

### *Education profile*

The MH heads who are uneducated comprise 58% of the respondent households. The remainder fall into the 'primary educational level' (35.23%), 'secondary level' (5.68%), and 'higher secondary level' (1.14%). Household heads having lower educational attainment levels are economically more vulnerable to a slack labour market than the more educated one.

**Table 5.** Profile of migrant households (MH) in the Haor area in Bangladesh.

| Attribute | | | Total amount of MH | |
|---|---|---|---|---|
| | | | Count | % |
| Education level of MH head | Uneducated | | 51 | 57.95 |
| | Primary | | 31 | 35.23 |
| | Secondary | | 5 | 5.68 |
| | Higher secondary | | 1 | 1.14 |
| | Total | | 88 | 100 |
| Land ownership (in decimal) of MH | Landless (0-49) | | 64 | 72.73 |
| | Marginal (50-149) | | 15 | 17.05 |
| | Small (150-249) | | 2 | 2.27 |
| | Medium (250-749) | | 4 | 4.55 |
| | Large (>750) | | 3 | 3.41 |
| | Total | | 88 | 100 |
| Poverty status of MH | Annual income per capita | Poor | 70 | 79.55 |
| | | Non-poor | 18 | 20.45 |
| | | Total | 88 | 100 |
| | Dry season income per capita | Extreme poor | 33 | 37.50 |
| | | Moderate poor | 33 | 37.50 |
| | | Non-poor | 22 | 25.00 |
| | | Total | 88 | 100 |
| | Self-perception | Poor | 86 | 97.73 |
| | | Not poor | 2 | 2.27 |
| | | Total | 88 | 100 |

### Natural resource profile

The natural resource (land) profile of MH (Table 5) depicts that 73% of MH are landless and hence are comparatively more vulnerable to seasonal crises than landed households. Of the remainder, the 'marginal', 'small', 'medium' and 'large' landownership categories represent 17.05, 2.27, 4.55 and 3.41% respectively. Land resources provide a form of insurance for overcoming crises, support migration expenditure and increase human capital (for example, affording education and medical services) in rural Bangladesh.

### Financial profile

The financial profile of MH (Table 5) reflects that 98% of the respondent household heads are self-perceived poor while on the basis of annual per capita income, 80% MHs are identified poor. The MH's main income sources are the dry season crop and related activities; on this basis, 75% of households are poor and 37.5% are extremely poor. These statistics differ from the other two measurements (annual income and self perception) confirming that the poor migrant households are more vulnerable to crop failure than other household categories.

### Resource endowment and poverty status of MH

All Haor household (including the MH) incomes mainly depend on the dry season crop cultivation and related agricultural and non-agricultural activities exceeding the wet season income. Thus, owning cultivable land affects the financial status of MH. Table 6 shows that 80 and 20% of the MHs are poor and non-poor, respectively. Of the former, 59% are landless and 14% are marginal farmers while in the latter group, 14% are landless. This raises two issues: that all landless MHs are not poor and MHs are not always poor. Among the 73% landless migrant households, 59% are poor and only 14% are non-poor.

The ongoing discussion underscores the association between flood-induced seasonal migration and persistent poverty. Capital-deficient migrant households are most vulnerable to seasonal (and other livelihood) crises while the seasonal migration strategy deepens the poverty trap

**Table 6.** Landownership of migrant households (MH) in poverty status.

| Land ownership of MH (in decimal) | Distribution of MH according to income Poverty | | | | Total number of MH | |
|---|---|---|---|---|---|---|
| | Poor | | Non-poor | | | |
| | Count | % | Count | % | Count | % |
| Landless (0-49) | 52 | 59.09 | 12 | 13.64 | 64 | 72.73 |
| Marginal (50-149) | 12 | 13.64 | 3 | 3.41 | 15 | 17.05 |
| Small (150-249) | 2 | 2.27 | 0 | -- | 2 | 2.27 |
| Medium (250-749) | 3 | 3.41 | 1 | 1.14 | 4 | 4.55 |
| Large >750 | 1 | 1.14 | 2 | 2.27 | 3 | 3.41 |
| Total | 70 | 79.55 | 18 | 20.45 | 88 | 100 |

**Table 7.** Profile of migrants (M) in the Haor area in Bangladesh.

| Attribute | | Gender of Migrant | | | | Total amount of Migrant | |
|---|---|---|---|---|---|---|---|
| | | Male | | Female | | | |
| | | Count | % | Count | % | Count | % |
| Education level | Uneducated | 46 | 52.27 | 1 | 1.14 | 47 | 53.41 |
| | Primary | 35 | 39.77 | 1 | 1.14 | 36 | 40.91 |
| | Secondary | 4 | 4.55 | -- | -- | 4 | 4.55 |
| | Higher secondary | 1 | 1.14 | -- | -- | 1 | 1.14 |
| | Total | 86 | 97.73 | 2 | 2.27 | 88 | 100 |
| Age | <20 | 0 | -- | 0 | -- | 0 | -- |
| | 20-30 | 39 | 44.31 | 0 | -- | 39 | 44.32 |
| | 31-40 | 31 | 35.23 | 1 | 1.14 | 32 | 36.36 |
| | 41-50 | 9 | 10.23 | 1 | 1.14 | 10 | 11.36 |
| | 51-60 | 4 | 4.55 | 0 | -- | 4 | 4.55 |
| | >60 | 3 | 3.41 | 0 | -- | 3 | 3.40 |
| | Total | 86 | 97.73 | 2 | 2.27 | 88 | 100 |
| Religion | Muslim | 79 | 89.77 | 2 | 2.27 | 81 | 92.05 |
| | Non-Muslim | 7 | 7.95 | 0 | -- | 7 | 7.95 |
| | Total | 86 | 97.73 | 2 | 2.27 | 88 | 100 |
| Employment status | In agriculture sector | 82 | 93.18 | 2 | 2.27 | 84 | 95.45 |
| | In other sectors | 4 | 4.55 | 0 | -- | 4 | 4.55 |

(Deshingkar and Start, 2003; Rafiq et al., 2003, 2006).

**Profile of migrant**

Table 7 depicts the seasonal migrant's profile in the Hoar area in Bangladesh. Demographically, migrants are pre-dominantly young males - 98% of migrants are male and 44% are below 30 years. Most migrants come from households with mainly uneducated heads although the former reflect literacy levels close to the national average. Among the educated migrants, 41% have attained a primary level of education compared to only 5% with secondary and higher secondary education. Among the migrants, 92% are Muslims and the balance non-Muslim (Hindu). Focus group discussions revealed that female seasonal migration has been obstructed by porda (socio-religious seclusion), cultural restriction, social norms, gender disparity (stereotyping), insecurity and very low wages. Seasonal migration is mainly undertaken by agricultural labor - above 95% of migrants have worked in the agriculture sector both in their homeland villages and destinations. Migrants are mostly poor, uneducated, land-less, wage and agricultural labor share croppers and marginal farmers in the Haor area as also reported by other studies (Afsar, 2000, 2005; Rayhan and Gorte,

**Table 8.** OLS estimates of the impact of seasonal domestic migration on poverty status of the Haor households.

| Variable | Dependent variable | | |
|---|---|---|---|
| | Income poverty (1 = Poor, 2 = Non-poor) | Seasonal domestic migration (but interactive factor) | Seasonal domestic migration (with interactive factor) |
| Seasonal domestic migration (1 if household has at least one migrant) | -0.1010 (2.015)** | | |
| Dry season income (in Taka) | 3.42E-06 (2.0804)*** | -1.51E-06 (2.803)*** | -2.55E-06 (4.074)*** |
| Cultivation land of migrant household (in decimal) | -9.88E-05 (1.009) | 4.83E-05 (0.418) | -0.0003 (2.122)** |
| Education of household head (Level of education) | -0.0149 (1.523) | | |
| Age of migrant | | -0.0019 (0.982) | -0.0013 (0.727) |
| Gender of migrant (1 if male) | | -0.0405 (0.345) | -0.0863 (0.739) |
| Household size | | 0.0274 (1.851)* | 0.0289 (1.984)** |
| Interaction between landholding and dry season income | | | 2.36E-09 (2.633)*** |
| Constant | 1.1884 (23.342)*** | 0.3459 (2.106)** | 0.4321 (2.633)*** |
| Observations | 292 | 292 | 292 |

Absolute value of t-statistics in the parentheses. * Significance at 10%. ** Significance at 5%. *** Significance at 1%.

**Table 9.** Probability of not making migration decision with or without specific policy measures.

| Variable | No policy support | Policy measure implemented | | | |
|---|---|---|---|---|---|
| | | 5 years | 5-10 years | 10-15 years | 15-20 years |
| Food stamp | 4.5 | 16.4** | 12.3* | 13.8** | 11.2 |
| Infrastructure facility | 1.7 | 8.6 | 8.6 | 10.1 | 9.6 |
| Cooperative activities | 3.2 | 9.6 | 10.9 | 12.2* | 11.1 |
| Combined support | 3.7 | 14.2** | 10.6 | 12.5* | 11.3 |

*/**=significant difference to the case without policy measure on a significance level of 0.1/0.05.

2007).

## Causes of migration

These causes were identified through interviews and focus group discussions – all, broadly, are closely associated with ecology, crop seasonality, labor and credit markets, resource endowments and coping strate-gies. Ecology plays a critical role by limiting agriculture to mono-cropping caused by the annual deluge and flash floods. However, unlike the DER report (2004), the annual rains (deluge) are a major cause of seasonal migration. A second reason is the absence of a labor market severely limiting causal employment while com-mon water resources are not open to mass fishing as these resources are leased out by the government and

informal local authority of religious institutions (for example, Mosques, Temples, etc.). Lack of knowledge, technology and finance hinder benefits accrue from the deluge water. Among others, inaccessibility to emergency public supports- though rare and insufficient but corrupt, nepotic and politically biased- impel seasonal migration in the Haor area during deluge. Migration is not a happy chapter for the inhabitants in the place of origin and of transit destinations. Hence, the migration occurs through "push back" theory in the absent of "pull in" therefore none of the partiers are happy (Alam and Hoque, 2010; Alam, 2009; Alam et al., 2009). Since it is a reality, both parties thus have accepted this as fact. If a better solution through reforming a policy can offer to resolve the situations, it will bring more peace and comfort the life standards of the individuals.

## Relationship between poverty and seasonal domestic migration

The statistical results examining this link are given in Tables 8 and 9. Table 8 shows that the coefficient of $\pi_m$ is not statistically significant as the $t$-statistic (1.05) is much higher than zero presuming no simultaneity quandary. The results indicate that the instrumental variable strategy is not necessary and, equations (3) and (4) are estimated although, to increase the model's specification robustness, some variables are not measured. For example, accessibility to infrastructure helps households to improve poverty but is excluded as its inclusion makes other factors insignificant in the poverty model. Similarly, accessibility to common water provides employment opportunities hence discouraging seasonal domestic migration which is also excluded from the migration model. To overcome multicollinearity, the size of cultivable land available to migrant households and dry season income is included in the migration equation.

For both poverty and migration models, the overall significance level varies between 1% - 10%. While the HH's education level in the poverty model and the migrant's age and education in the migration model are insignificant, these explanatory variables have the expected negative association with their respective dependent variables (Bhuyan et al., 2001; Deshingkar and Grimm, 2004). Table 8 shows that land holding and migration propensity are positively associated as expected but not statistically significant. However, when the interacting factor ($Land_{mh_{D_t}}$) is included, it shows negative association and becomes statistically significant at the 5% level confirming the expected negative association between natural capital holdings and migration propensity.

The relationship between cultivated land size and the household's poverty status is expected to be negative. Although that relationship is not statistically significant, the finding of the study reveals that expected association persisting between financial status and natural capital of the Haor households. The found relationship may not coincide with the household's self perception poverty when it is considered as a dependent variable which is an issue of further research.

## Need for new policies

From the focus group discussions, most migrants have no arable land which could be divested or mortgaged to cope with seasonal crisis and migration costs. Additionally, the household members left behind incur costs (of borrowing and consumer goods from local functionaries). A significant issue is the migration and gainful employment period which are themselves, dependent on the short crop season and natural calamities prevailing at the destination. In most cases, migrants do not have job guarantees, work for low wages and suffer exploitation and health problems. Remittances home suffice only for the household's subsistence needs: such livelihood diversification strategies may not improve its poverty status or alter significantly its debt burden.

## Framework of planning: Government and policy

The links between poverty and seasonal domestic migration are based upon the lack of agricultural or related employment activities in the seasonal floods in the Haor area of Bangladesh. Dependence on dry season crop income is a significant but insufficient foundation for the livelihood strategies especially of the landless Haor households. In this study, a framework to study and identify policy alternatives has been developed to alleviate the Haor seasonal migration issue.

The statistical analysis in this study provides policy-makers simulation scenarios to assist in selecting from among such different alternative interventions to alleviate the problem of seasonal domestic migration by improving infrastructural facilities, government food stamps, access to semi-government (for example, Grameen Bank, PKSF[12]) or NGOs and/or cooperative activities[13] (Table 9). A simulation analysis is provided with a model setup with/and without additional policy support. The results are classified according to classes of activities and their effects on the Haor peoples' livelihoods.

The statistical analysis indicates substantial additional support from the government or NGO is needed to alleviate the seasonal migration issue. The Haor households suffer debilitating poverty and make the decision to migration as a survival strategy. Incentives can provide them the supplementary security of survival and preclude considering the migration decisions. Among the alternative policy measures, the most attractive is food stamp support followed by local cooperative activities, infrastructure facility support by government (for example, public credit accessibility, education facilities, road communication and Haor dike construction), semi-government and non-government (for example, micro-credit, education and health services) sources. Policy-makers should focus their efforts on providing incentive financing directly or providing support for work-generating opportunities in the Haor area during the seasonal floods.

## Conclusion

This study advocates capital development initiatives when the Haor ecosystem fails to promote sustainable livelihoods to the seasonal domestic migrant who are the victims of that ecosystem's intrinsic climates. Seasonal migrants mainly comprise the uneducated and capital deficient wage laborers seeking work in other agricultural

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[12] Polli Kormo Sohayok Foundation.
[13] Including command and control over common resources.

high land regions during non-crop flooding season. Empirically, relationships of landownership to poverty and seasonal domestic migration have been found logical and effective for livelihood diversification in the Haor area. The study discloses the inconclusive poverty-migration nexus into an ex-post coping strategy as living costs are incurred *in situ* and the migrant's destination, incomes earned during the crops season are insufficient to meet household needs in the flood season when households depend on exploitative moneylenders and shopkeepers, while the migrant suffers various challenges at the point of destination affecting the size of remittances sent home. In this regard, both the profiles of individual and house-hold of migrant and statistical results reveal the fact of accumulating capital is required ensuring productivity increment of the Haor household. For poverty reduction, a mingled of *in-situ* development strategies affirm meaningful outcome of a multidimensional combined poli-cies effort. Following such policies would be effective to sustain and increase household's income and decrease livelihood grueling.

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