DEVELOPMENT OF A MULTIDIMENSIONAL SUSTAINABLE LIVELIHOODS MODEL FOR RURAL BANGLADESH

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ABSTRACT

This paper offers a multidimensional livelihoods asset model customized to local priorities in rural Bangladesh, and so advances the DFID’s livelihoods model. The model enables measurement of relative livelihoods asset achievements of poor men and women. The study is based on primary data collected from 30 villages in Bangladesh. It has been observed that women have better record in achieving social capital (such as vote casting, decision making at jobs, etc.) whereas, men are better off in gaining financial capital (such as higher savings). Significantly less achievement in the indicators of human capital (such as more sick days, and high morbidity) in the rural areas is alarming. Results of the study revealed that rural men feel unsecured due to lowness of income and abuse of local political leaders whereas, women feel discriminated as MFIs offer them smaller sized credit compared to male borrowers. Finally, it was observed that both the groups feel significantly high level of mental stress which has impact on their social, physical and human capital. Development partners (government and donors) and MFIs need to concentrate more on the social dimensions of livelihoods, and that to reduce the mental stress of the beneficiaries, they need to concentrate more on credit delivery, customized rate of interest and flexible repayment schedules.

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INTRODUCTION

The Department for International Development’s (DFID) Sustainable Livelihoods (SL) Approach (Chambers & Conway, 1992) is a widely used1 method that links the understanding of the available endowments (asset or capital) of poor and vulnerable people with the importance of policies and institutions in enhancing those endowments to reduce poverty in developing countries. Like Sen’s (1985) human Capability Approach2 (CA), the sustainable livelihoods model also assumes that people require a range of assets to achieve positive livelihood outcomes (such as economic solvency or social inclusion) and no single category of asset is sufficient to ensure such outcomes. Thus, the multidimensionality of deprivation has increasingly been recognized in the livelihoods approach.

The model stresses four different types of sustainability as discussed below:

a) Environmental sustainability is achieved when the productivity of life-supporting natural resources is enhanced for next generations;

b) Economic sustainability for the poor is achieved if a baseline3 level of economic welfare can be sustained;

c) Social sustainability is attained when social exclusion is minimized; and

d) Institutional sustainability requires the prevailing structures and process to have the capacity to perform their functions for a longer time period.

According to above stated definitions, economic and social sustainability are the livelihood targets of poor people, whereas, environmental and institutional sustainability are the goals of development partners in the poverty reduction projects. Thus, from the broadest perspective, the assets required (by poor) for sustainable livelihoods can be grouped into two major categories, namely, economic and social; this is similar to the existing poverty analyses4.

Serrat (2008) in his study suggested that even though the sustainable livelihoods approach is one way of integrating the complex issues that surround poverty, this model needs to be customized to local circumstances and local priorities5. We strongly feel that poverty reduction will not be sustainable unless a targeted approach is formulated to identify the asset needs of specific sub-groups. Our argument is further supported by the fact that large scale credit delivery did not contribute significantly in the poverty reduction rate6 in rural Bangladesh which may be due to non-identification of the asset needs of the poor in rural Bangladesh. To address such issue, this paper by using the method proposed by Chowdhury and Mukhopadhaya (2012) offers a validated multidimensional livelihood
asset model for rural Bangladesh by applying the SL approach. This model can pinpoint and prioritise different asset needs of poor people of rural Bangladesh. Findings of the study will enable the development agencies to help people by better targeting (customized and gender-based) and fulfilling their needs in order to enhance capabilities to fight poverty.

**SUSTAINABLE LIVELIHOODS APPROACH**

The sustainable livelihoods approach takes a holistic view of tackling poverty and puts poor people and their priorities at the centre of development strategies. The principles of the SL approach demand a shift in focus from outputs to people and an exploration of poor people’s own priorities. This approach is based on evolving thinking about the way the poor and vulnerable people live their lives and the importance of policies and institutions in the poverty alleviation process.

The model has four distinct parts (Figure-1). The SL framework depicts the main dimensions that affect people’s livelihoods and show the typical relationships between them. The approach is most likely to begin with simultaneous investigation of people’s current level of vulnerability, their assets, their objectives (Livelihood Outcomes) and the Livelihood Strategies which they undertake to achieve these objectives.

The first part deals with ‘vulnerability’ issues; including natural (for instance, river erosion, cyclone, drought, epidemics, flood, sea level change, etc.), social (such as injury, robbery, disability, death of family members, etc.), economic (unemployment, inflation, and high rate of interest) and political (political violence, strikes, governance crisis, etc.), along with shocks that may push a large portion of rural people into poverty. The second part, which is the main focus of our paper, discusses five different types of capital (usually depicted by a pentagon) that are important in maintaining an acceptable standard of living. In general these broad livelihood capitals can be defined as:

a) **Human** capital e.g., health, nutrition, education, knowledge and skills, capacity to work, capacity to adapt, etc.

b) **Social** capital e.g., networks and connections, relationships of trust, mutual understanding and support, formal and informal groups, shared values and behaviours, mechanisms for participation in decision-making, leadership.

c) **Natural** capital e.g., land and produce, water and aquatic resources, trees and forest products, wildlife, wild foods, and environmental services.

d) **Physical** capital e.g., infrastructure (secure shelter and buildings, water supply and sanitation, energy, communications), tools and technology (equipment for production, seed, fertilizer, pesticides, traditional technology).

e) **Financial** capital e.g., savings, credit and debt, remittances, pensions, wages.

The model clarifies various methods for building different types of capital. For instance, to build a financial capital, collateral-free credit facility, increased savings and tailored financial services are pre-requisites. But before crafting the strategies to achieve livelihood outcomes, it is important to explore the customized asset needs of local poor. However, there is no study on developing the livelihood asset needs based on the opinion of the poor in rural Bangladesh. To understand the local circumstances (gap-1 in Figure-1). Creation of such a model will help the development partners identify and better target the livelihood assets, access to which will enhance the living standards and capability of the rural poor thus accelerating the poverty reduction rate.

The next part of the model discusses structures, policies and processes that help the poor in identifying the services available and the method of accessing them from the institutions involved. Two powerful sectors act in this whole process: (1) the public sector comprising political and judicial bodies with line ministries and quasi-governmental organizations; and (2) the private sector including NGOs, civil society, commercial organizations, membership organizations, etc. This sub-section of the model, which consists of public and private sectors, is termed the “structure” because these institutions make the processes function. Several strategies have been offered for a better and more people-centred structure. One such strategy being a pro-poor structure with poor people’s representatives; providing support to engage more of the private sector and forming collaborative projects with the public and private sectors if required.

The final part of the model recommends the building of livelihood strategies as the capability set for a better livelihood outcome. For instance, micro-credit along with a peer monitoring approach is a recognized strategy to create financial capital (by creating direct income and savings) and social capital (by organizing group meetings and incorporating the poor in the decision-making) to fight poverty. In this part, the model includes a range and combinations of activities and choices that people can make in order to achieve their livelihood assets. This includes human capability building, the use of different combinations of tools (for instance, credit, health care, education, etc)
and identifying customized asset needs of poor men and women. Thus, a gender-based comparison of asset needs is important (indicated as gap-2 in Figure-1). Absence of such a study may create waste due to mis-targeting the asset needs which results to ineffective utilization of investment of donors.

FIGURE 1. DFID’S SUSTAINABLE LIVELIHOOD FRAMEWORK IN POVERTY REDUCTION AND ITS LIMITATIONS


GENERATING INITIAL POOL OF INDICATORS

With the intention to develop a multidimensional livelihood asset model that will be used in the comparative study between men and women, our primary task is to explore the indicators that reflect economic, social, cultural and political aspects of livelihood. Lists of those indicators that are relevant to the lives of rural poor were prepared and a summary of those livelihood indicators is provided in Table-1 (2nd and 3rd rows). On the other hand, as most of the development partners use micro-credit as the main (in some cases only) tool to enhance the wellbeing of the poor, the loan repayment rate, frequency of defaulting, repeat borrowers rate, length of borrowing, etc. are direct indicators of overall livelihoods achievement. A list of these indicators is presented in row-4, Table-1.
TABLE 1. DIMENSIONS AND ITEMS FOR THE MULTIDIMENSIONAL LIVELIHOOD MODEL

<table>
<thead>
<tr>
<th>Outcome dimensions</th>
<th>Influential assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Livelihoods</td>
<td>Items related to food intake/day by family members, income/month, savings/month, access to electricity, sanitary latrine and safe water, home and land ownership pattern, land holding size, other household assets, average sick days/month (for last 6 months) of the family members, morbidity status, capacity to work (5 hours at stretch) in daily life, food intake at the time of income shortage, degree of vulnerability with respect to land and asset ownerships, etc.</td>
</tr>
<tr>
<td>Social Livelihoods (includes social, cultural and political aspects)</td>
<td>Influential indicators are: access to information about natural disaster alert, loans, education, health and jobs, information about politics and local and central government, freedom to perform social, cultural, religious and political works, participation in society and politics and voting behaviour, opportunity of decision-making at household and work place, experience of robbery and theft, mental stress and feelings of insecurity, etc.</td>
</tr>
<tr>
<td>Overall livelihoods achievement</td>
<td>Indicators such as loan repayment capability of the beneficiaries, amount borrowed, length of borrowing from a particular provider with repeat borrowing rate, etc.</td>
</tr>
</tbody>
</table>

Note: Adapted and modified from Chowdhury and Mukhopadhaya (2012)

METHODOLOGY AND THE MODEL

To build the model, primary data was collected by way of a survey questionnaire. The questionnaire was mixed-mode; it includes questions with multiple response options on a Likert-type scale, and few were dichotomous in nature. A formal questionnaire consists of 8 sections (including first section that contains general and demographic information of the respondents) and 62 questions was developed. Second and third section of the questionnaire include questions regarding health conditions and educational status of the respondents respectively. Fourth section incorporates information about access to utilities whereas Section-5 details individual asset and income related questions. Section-6 highlights the issues relevant to empowerment and decision making, and section-7 includes items relevant to security in everyday living. Section-8 reflects the opinion about support services and that includes the information about the indicators listed in row-4 of Table-1. A pilot study on a small sample (40 respondents) was organized in Samserabad village of Lakshmipur district of Bangladesh to assist with the fine-tuning of the final questionnaire.

We have initially selected seven districts for data collection. However, to have the same number of districts (3 from each) covered from Northern and Southern part of Bangladesh, we did collect data from six districts. These six districts were selected on the basis of common economic, social and natural features of the areas. To eliminate possibilities such as closeness to better roads or town centre, villages to be surveyed were selected purposively with a single criterion that they are more distant from the district headquarters (such that the grass-roots level and most disadvantaged people could be surveyed). Thus, the effects of closeness to good infrastructure and regional centre are almost not applicable in case of the chosen respondents.

Households were chosen randomly by considering three criteria: 1) to maintain the similarity, respondents who borrowed microcredit had been chosen and it was also ensured that they did not have any other sources of income (such as another family member working in the city areas or abroad); 2) each respondent has only one credit scheme (loan size between US $100-150) either from government or NGO; and 3) households with less than half an acre of land were eligible for the study (similar approach was used by Khandkar, 1996). The above conditions are made to make sure that the present economic and social states of the respondents, to large extent, are the results of micro-credit.

Reviewing all the respondents, it was found that few of them were comparatively richer people during their preliminary membership, who had alternative financing ability from sources other than micro-credit. Responses of these respondents were dropped at the time of analysing the data. A total of 618 questionnaires were then utilized which are completed from 30 villages of 6 districts, namely, Kurigram, Nilphamari, Gaibandha, Potuakhali, Barguna, and Jhalokathi. Among these usable questionnaires, 322 (52%) were from women and 296 (48%) from men. The multi-stage sample selection procedure is shown in Figure-2.

FIGURE 2. SAMPLE SELECTION AND DATA COLLECTION PROCEDURES

Base on HCR>0.60, 7 districts were selected. They are: 3 districts from Barisal division (Barguna, Jhalokathi & Potuakhali), and 4 from Rajshahi (Gaibandha, Kurigram, Lalmonirhat, Nilphamari & Rangpur).

6 districts finally selected sharing common economic, social and natural features. These are: Barguna, Jhalokathi, Potuakhali, Gaibandha, Kurigram, and Nilphamari.
Model development process

As mentioned earlier, this model has been developed by using the method offered by Chowdhury and Mukhopadhyaya (2012). Interested readers can find more technical description from the stated reference. However, for general readers, we will provide a brief of the model development process by including the variables of our questionnaire.

At the primary stage of developing the model, we included 56 livelihood asset and six institutional service-related items (each as one question) with two broader livelihood dimensions (economic and social livelihoods) and one overall livelihoods achievement dimension. Note that all 56 items do not directly influence economic or social livelihood dimensions (as can be seen the direction of arrows in Figure-3). This means that there will be a few additional dimensions (as labelled as intermediary dimension in Figure-3) which are directly influenced by several of these 56 items, and those dimensions directly affect economic or social livelihoods (refer to Figure-3). For instance, average sick days or morbidity status (items) of the person may not be directly related to economic livelihoods, rather they have a direct relationship with human capability building (an intermediary dimension). This capability in turn affects the economic livelihoods of the person because the more physically capable people can earn more and are as a consequence economically better-off.

FIGURE 3. HYPOTHESIZED MODEL FOR ASSET IDENTIFICATION AND OVERALL LIVELIHOODS ACHIEVEMENT ASSESSMENT

Summarily, we hypothesize that many of these 56 items will be grouped into different intermediary dimensions which influence economic and social livelihoods dimensions. And the level of achievements of the assets of economic and social livelihoods by the poor is the measure of overall livelihoods achievement dimension. Thus, these 56 items (assets) influence the overall achievement dimension indirectly through their respective intermediary dimensions and these intermediary dimensions affect final two dimensions (economic and social) that determine the level of overall livelihoods achievement. On the other hand, there are six other institutional items (as listed in row-4 of Table-1) that directly affect overall livelihoods achievement.

To estimate the proposed model empirically, Structural Equation Modelling (SEM) is used to explore those indirect and unobserved relationships. Unlike the traditional multivariate analysis tools (such as regression), SEM enables to answer a set of interrelated research questions in a systematic way by modelling the relationships among multiple independent (such as intermediary dimensions in Figure-3) and dependent dimensions (Economic, Social...
and Overall livelihoods achievement dimensions) simultaneously. This capability for simultaneous analysis differs greatly from most traditional regression models such as linear regression, LOGIT, ANOVA, and MANOVA, which can analyze only one layer of linkages between independent and dependent items at a time. Furthermore, SEM allows the researchers to combine multiple observed items of a dimension (through exploratory factor analysis) and then model the causal relationships amongst these dimensions rather than amongst single observed items which are merely proxies for that dimensions.

Our estimation process (SEM) begins with Exploratory Factor Analysis (EFA) to explore the relevance of items with specific dimensions. EFA detects: a) items that influence social and economic dimensions directly; b) items that have an indirect relationship to social and economic livelihoods, but have direct relationships to other intermediary dimensions that directly affect social and economic dimensions; and c) items that are less relevant to the study of livelihood asset in Bangladesh according to the opinions of the respondents. Following usual procedure of EFA, we found that our 62 items belong to 16 individual dimensions. Then to identify the most relevant items and dimensions, we used a moderately strict decision rule of deleting items with cross-loading or loading less than 0.50 on any dimension and carrying less communal ity values (<0.50). As a result, a total of nine items and three dimensions were dropped from the raw model after a number of iterations. This purification process through EFA continued until each and every item fulfilled the suggested requirements. Finally, a total of 11 dimensions represented by 43 items were selected with 68.34% of total variance explained.

As a next step, Confirmatory Factor Analysis (CFA) is used to test if the relationships between grouped items and their corresponding dimensions truly exist. This step confirms that a specific item belongs to only one dimension and has no relation with other dimensions of the model. To purify individual models by dropping insignificant items, we have considered several criteria such as: 1) items with loading less than 0.40 would be dropped from further study, 2) satisfactory fit indices were considered, 3) items with bigger modification index were dropped too, and 4) in addition to statistical results, judgemental views were considered as well. Judgemental views were taken into consideration from qualitative comments of the respondents. Thus, we determined the significance of droppable variables based on the existing literature and qualitative observations from field studies, as well as judgment based on the loading values identified in the statistical process. By considering the stated criteria, finally 11 dimensions with 36 items were retained in CFA and they are depicted in Table-2.

**TABLE 2. DIMENSIONS AND THEIR LIVELIHOODS ITEMS AFTER CFA**

<table>
<thead>
<tr>
<th>Assets retained through CFA</th>
<th>Proposed name of the dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to natural disaster, loan, education, health and job-related information</td>
<td>Access to general information</td>
</tr>
<tr>
<td>Sharing political and government information</td>
<td>Access to governance information</td>
</tr>
<tr>
<td>Freedom to perform cultural, religious and political works</td>
<td>Freedom</td>
</tr>
<tr>
<td>Home ownership, land-holding size and status</td>
<td>Asset building</td>
</tr>
<tr>
<td>Average sick days of males and females, morbidity and capacity to work normally</td>
<td>Human capability building</td>
</tr>
<tr>
<td>Food intake per day of male, female and children</td>
<td>Core need fulfilment</td>
</tr>
<tr>
<td>Opportunity of making decision at home , experience of theft and robbery and food consumption at the time of income shortage</td>
<td>Vulnerability</td>
</tr>
<tr>
<td>Monthly income and savings, access to electricity and sanitary latrine</td>
<td>Economic livelihoods</td>
</tr>
<tr>
<td>Opportunity of making decision at work place, mental stress and feelings of insecurity</td>
<td>Social livelihoods</td>
</tr>
<tr>
<td>Loan repayment status, amount of loan taken and length of borrowing by the beneficiaries</td>
<td>Overall livelihoods achievement</td>
</tr>
<tr>
<td>Voting by male and female beneficiaries, choice of preferred candidates</td>
<td>Empowerment</td>
</tr>
</tbody>
</table>

As the next step, we constructed a measurement model (refer to Figure A1 in appendix) which assesses the extent to which all dimensions found in the CFA and their measured items as a whole are operational and compatible as a single model. At the time of checking the construct reliability of the model and each dimension, it was found...
that other than ‘Vulnerability’ dimension (reliability is only 0.35) other dimensions have high reliability value ranging from 0.56 to 0.91. This suggests that ‘Vulnerability’ dimension and its corresponding items are less significant in this model. Less importance of this dimension may be due to the following reasons; a) our results show that more than 91% of ‘household decisions’ are made jointly, thus rendering this item less important in the whole model; and b) because of the low income levels of the respondents, they own very little of value and therefore the ‘theft from their home’ item also lacks importance. Since two out of three items of the ‘Vulnerability’ dimension were found to be less important, this dimension and its corresponding items were dropped due to low extracted value of average variance (32.03%) with less construct reliability (0.35). Deletion of this dimension provides further evidence that vulnerability is a visible effect (symptom) of poverty but not the root cause or dimension of poverty

At this stage, we had 10 livelihoods dimensions and 32 corresponding items. The preliminary structural model is constructed in such a way that ‘Overall Livelihoods Achievement’ by poor people is measured through fulfilment of ‘Economic’ and ‘Social’ livelihoods. Furthermore, ‘Economic livelihoods’ is influenced by ‘Core need fulfilment’, ‘Human capability building’ and ‘Asset building capability’ of the beneficiaries. On the other hand, ‘Social livelihoods’ is the result of ‘Access to general information’, ‘Access to governance information’, ‘Empowerment’ and ‘Freedom’. Similar explanations can be given to demonstrate the relationships among individual livelihoods assets and their corresponding dimensions

When we ran first structural model, two items (access to loan and job information) found to have loading less than 0.40 and thus were dropped from further study. The finalized structural livelihoods model (shown in Figure 4) demonstrates satisfactory fit values. In addition, all loading values were reported to be greater than 0.45 with a Coefficient-H reliability value of 0.921.

**FIGURE 4. FINAL MULTIDIMENSIONAL LIVELIHOODS ASSET MODEL FOR RURAL BANGLADESH**

Relating our model to the livelihood assets of SL approach
Table-3 compares the livelihood assets of our model with DFID’s sustainable livelihoods approach and thus justifies the applicability of the SL approach for rural Bangladesh. However, it is important to note that all the items listed in the livelihoods approach are not present (nor applicable) because our model is customized to the need preferences of the people in rural Bangladesh.

**TABLE 3. COMPARING VARIOUS CONCEPTS OF CAPITALS: THE LIVELIHOODS APPROACH AND OUR MODEL FOR BANGLADESH**

<table>
<thead>
<tr>
<th>Asset category in Livelihoods model</th>
<th>Dimension in our model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human capital</td>
<td>‘Human capability building’ (4 items)</td>
</tr>
<tr>
<td>Social capital</td>
<td>‘Social livelihoods’ comprising ‘access to information’, ‘Empowerment’ and ‘freedom’ (11 items)</td>
</tr>
<tr>
<td>Physical capital</td>
<td>‘Core need fulfilment’ and some part of ‘Economic Livelihoods’ (4 items)</td>
</tr>
<tr>
<td>Financial capital</td>
<td>‘Economic Livelihoods’ and some part of ‘Asset-building’ (7 items)</td>
</tr>
<tr>
<td>Natural capital</td>
<td>‘Asset-building’ (3 items)</td>
</tr>
</tbody>
</table>

Distinguishing feature of our model is that it offers few additional indicators of livelihood achievement especially the institutional items (3 indicators). However, these three items are applicable only for credit recipients.

**COMPARING DEGREE OF LIVELIHOOD ACHIEVEMENT BETWEEN MEN AND WOMEN**

In this section, a validated and invariance checked structural livelihoods model (shown in Figure-4) will be used to compare the degree of livelihoods asset achievement by men and women in rural Bangladesh.

**Comparison based on individual livelihoods dimensions: An asset pentagon-based comparison**

We begin the comparison based on main livelihoods dimensions reported in Table-4. We have divided the whole data into two groups of respondents (male and female) and then calculated the loading values of each dimension (shown by parabola in Figure-4).

**TABLE 4. COMPARATIVE LOADINGS OF LIVELIHOODS DIMENSIONS FOR MEN AND WOMEN**

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL LIVELIHOODS</td>
<td>0.322 (0.000)</td>
<td>0.623 (0.000)</td>
</tr>
<tr>
<td>ECONOMIC LIVELIHOODS</td>
<td>0.412 (0.002)</td>
<td>0.035 (0.000)</td>
</tr>
<tr>
<td>ACCESS TO GENERAL INFORMATION</td>
<td>0.232 (0.00)</td>
<td>0.299 (0.00)</td>
</tr>
<tr>
<td>ACCESS TO GOVERNANCE INFORMATION</td>
<td>0.355 (0.008)</td>
<td>0.288 (0.00)</td>
</tr>
<tr>
<td>HUMAN CAPABILITY_BUILDING</td>
<td>0.182 (0.002)</td>
<td>0.221 (0.00)</td>
</tr>
<tr>
<td>ASSET BUILDING</td>
<td>0.344 (0.02)</td>
<td>0.425 (0.00)</td>
</tr>
<tr>
<td>FREEDOM</td>
<td>0.401 (0.00)</td>
<td>0.548 (0.048)</td>
</tr>
<tr>
<td>CORE NEED_FULLFILLMENT</td>
<td>0.284 (0.00)</td>
<td>0.312 (0.00)</td>
</tr>
<tr>
<td>EMPOWERMENT</td>
<td>0.248 (0.01)</td>
<td>0.235 (0.00)</td>
</tr>
</tbody>
</table>

Note: Values in parentheses show the level of significance.

A schematic asset-pentagon (like the one shown in Figure-1 part-2) based comparison has been made between men and women from the findings shown in Tables 3 and 4. For each capital the maximum possible loading value is 1 (the frontier). The frontier of the pentagon for a best possible situation is drawn accordingly. This ‘best frontier’ is now compared with the estimated values of various livelihoods dimensions. Thus, the sides of the new pentagons are drawn based on the loading values (reported in Table-4), which show the degree of livelihoods achievements by the respondents. For example, in Table-3 we have shown that social capital of the livelihood model is represented in our model by the indicators of social livelihoods. Thus, the loading values of social livelihoods for men (0.322) and
women (0.623) reported in Table-4 are their respective value in the social capital endowment line of the asset pentagon (in Figure-5). Again, Table-3 linked financial capital of SL model with the items of economic livelihoods dimension of our model. Loading of economic livelihoods for men and women are 0.412 and 0.035 respectively (in Table-4) and thus these are the values of the financial capital endowment of asset pentagon (in Figure-5). Similar explanation can be given for the values of natural (asset building in Table-4), human (human capability building in Table-4) and physical capital (Core need fulfillment in Table-4) endowment (respective loading are reported in Table-4).

**FIGURE 5. MEN AND WOMEN COMPARED BY LIVELIHOODS CAPITAL PENTAGON**

A bigger pentagon inside the frontier represents the higher level of livelihoods asset achievement. Gaps between the corner points of the pentagon of men and women from the frontiers (from the value 1) show the dead weight loss in utilizing resources for poverty reduction programs. In Figure-5, dotted and solid line pentagons are used for men and women respectively.

In spite of large investment in women’s welfare and empowerment, results suggest that women are still more disadvantaged compared to men in financial aspect. A significant gap of 0.377 in this aspect is worth notable. This gap may be due to two reasons; 1) loan repayment rate is significantly higher for women compared to men (see next section), and 2) women have created more assets (refer to natural capital) and thus they have less amount of financial assets in hand. A reduced rate of interest on credit can help both men and women to accumulate more financial assets – a recommendation for MFIs. To empower women through income generation and economic solvency - another main aim of microfinance programs – we recommend that not more credit (which is the conventional wisdom) rather, more targeted credit facilities or customized loans with complementary training should be introduced such that women can utilize their loan more effectively for better income generation. We would like to see the training of women in non-traditional work extended to avoid the market saturation and income loss that can often result from simply working within women’s traditionally defined job roles.

In four other livelihood indicators, women are comparatively better off in all fields (see Figure-5). And the findings that women are performing much better in four fields are the evidences that microcredit could close the gender gap in several aspects of living. A significant gap (0.30) in social capital signifies that women have become socially better off due to their weekly group meetings in microcredit projects. This finding is in line with the finding of Sanyal (2007) who found that social agency of women (where women meet regularly with other women) expanded women’s mental capacities and this is reflected in their new attitudes and actions thus improving the associative effects as described in Sen’s (2000) concept of capability.

Interestingly it can be observed (refer to Table-4) that women have better access compared to men to ‘general information’ (28% more) such as; information related to natural disasters, education, and health, which further signifies the importance of what Kabeer (2001) termed as ‘agency’. Significant variation is also observed in women’s asset creation (23.54% more than men) which answers why women have less liquid cash than men.
However, this is a positive sign of improvement because ownership of assets (particularly land and houses) reduces the level of vulnerability of rural poor.

‘Freedom’ is another important livelihood dimension as identified by our model and results show that women are better than men (20.69% more in Table-4) in this particular aspect, which strongly suggests that microfinance is effective for women empowerment. Interestingly it was observed that women are also better than men (17% higher) in ‘human capability building’ aspects of livelihoods. This positive finding is due to government’s and donor’s rural health projects (Surjor Hashi Clinic and Maternity clinics) which helped to reduce morbidity and sick days per month. We recommend that this particular aspect should be better targeted by the development partners because credit can’t contribute a lot unless people are physically better off.

Two major recommendations can be made from our findings:

a) Priority should be given towards financial capital-building (existing values are 0.412 and 0.035 for men and women respectively); and

b) As the respondents believe that poor people mostly depend on their bodily labour for earnings, more resources need to be channelled towards the creation of human capital (loadings are 0.182 and 0.221 for men and women respectively) to make poverty reduction sustainable.

The comparative statistics on individual livelihoods items are reported in Table-5 which shows that, out of 27 items, men are superior in 13 fields whereas women lead in 14 other fields. Detailed discussion for each item is provided in the next section.

### TABLE 5. STANDARDIZED LOADING VALUES FOR MEN AND WOMEN

<table>
<thead>
<tr>
<th>Measured assets</th>
<th>Dimensions in the model</th>
<th>Estimates for Men</th>
<th>Estimates for Women</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to health information</td>
<td>ACCESS TO_GENERAL INFO</td>
<td>0.593</td>
<td>0.515</td>
<td>Men are better</td>
</tr>
<tr>
<td>Access to educational information</td>
<td>ACCESS TO_GENERAL INFO</td>
<td>0.594</td>
<td>0.679</td>
<td>Women are better off</td>
</tr>
<tr>
<td>Access to natural disaster alert</td>
<td>ACCESS TO_GENERAL INFO</td>
<td>0.525</td>
<td>0.731</td>
<td>Women have better access</td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to political information</td>
<td>ACCESS TO_GOVERNANCE INFO</td>
<td>0.454</td>
<td>0.222</td>
<td>Men have much better access</td>
</tr>
<tr>
<td>Access to government information</td>
<td>ACCESS TO_GOVERNANCE INFO</td>
<td>0.480</td>
<td>0.322</td>
<td>Men have 1.5 times more access</td>
</tr>
<tr>
<td>Capacity to work normally</td>
<td>HUMAN CAPABILITY_BUILDING</td>
<td>0.688</td>
<td>0.732</td>
<td>Women can work better</td>
</tr>
<tr>
<td>Morbidity**</td>
<td>HUMAN CAPABILITY_BUILDING</td>
<td><strong>0.624</strong></td>
<td><strong>0.710</strong></td>
<td><strong>Men are better off</strong></td>
</tr>
<tr>
<td>Average sick days/month**</td>
<td>HUMAN CAPABILITY_BUILDING</td>
<td>0.328</td>
<td>0.326</td>
<td>Women have less sickness</td>
</tr>
<tr>
<td>Land holding status</td>
<td>ASSET_BUILDING</td>
<td>0.409</td>
<td>0.579</td>
<td>Women have much better achievement</td>
</tr>
<tr>
<td>Land holding size</td>
<td>ASSET_BUILDING</td>
<td>0.612</td>
<td>0.557</td>
<td>Men achieved more</td>
</tr>
<tr>
<td>Home ownership</td>
<td>ASSET_BUILDING</td>
<td>0.889</td>
<td>0.592</td>
<td>Women have lost their homes</td>
</tr>
<tr>
<td>Freedom of performing Political work</td>
<td>FREEDOM</td>
<td>0.774</td>
<td>0.421</td>
<td>Men are more engaged</td>
</tr>
<tr>
<td>Freedom of performing Religious work</td>
<td>FREEDOM</td>
<td>0.722</td>
<td>0.640</td>
<td>Men are better off</td>
</tr>
<tr>
<td>Freedom of performing Cultural work</td>
<td>FREEDOM</td>
<td>0.692</td>
<td>0.912</td>
<td>Women are performing better</td>
</tr>
<tr>
<td>Income/month</td>
<td>ECONOMIC_LIVELIHOODS</td>
<td>0.432</td>
<td>0.527</td>
<td>Women have better income</td>
</tr>
<tr>
<td>Save/month</td>
<td>ECONOMIC_LIVELIHOODS</td>
<td>0.422</td>
<td>0.229</td>
<td>Men can save more</td>
</tr>
<tr>
<td>Use of sanitary latrine</td>
<td>ECONOMIC_LIVELIHOODS</td>
<td>0.429</td>
<td>0.373</td>
<td>Women are worse off</td>
</tr>
<tr>
<td>Food intake/day by kids</td>
<td>CORE NEED_FULLFILLMENT</td>
<td>0.563</td>
<td>0.862</td>
<td>Women headed families are better</td>
</tr>
<tr>
<td>Food intake/day by adult</td>
<td>CORE NEED_FULLFILLMENT</td>
<td>0.822</td>
<td>0.741</td>
<td>Men consumer more</td>
</tr>
</tbody>
</table>
DISCUSSION AND POLICY IMPLICATIONS

Two major contributions of this model are; 1) it offers livelihood asset list for rural Bangladesh, and 2) it targets three (vote casting by male and female, and voting preferred candidates) new livelihood assets that need to be addressed for sustainable poverty alleviation and empowerment of poor. Fulfilment of these three new asset need is pre-condition for democracy as well as poor’s participation in the development process.

Results (Table-5) show that women have significantly less access to political (2 times less for women) and government (1.5 times less) information. These findings are further supported by the results of women’s freedom to involve in political works which shows that women are much worse off in this regard (1.83 times less empowered) too. Government and development partners (such as NGOs) need to create awareness and should ensure social mobilization so that poor people (especially women) can exercise their political rights properly. Bangladesh government’s Access to Information (A2i) initiative which provides all sorts of information can be helpful in this ground. But to ensure the efficacy of A2i project, higher literacy and rural-level coverage are vital. Our study also revealed that due to participation in weekly group meetings, women can perform their cultural works in a way (1.32 times better than men) which supports the relationship between women’s social engagement and empowerment (Kabeer, 2001; Mayoux, 1999).

It can be seen (Table-5) that average sick days/month is significantly low for both men (0.328) and women (0.326) which is a remarkable achievement. Government’s satellite clinics, mobile health care centres, family welfare visitors, medical assistants and NGO’s large scale investment in health sector should get credit for such achievement. However, our results also revealed that despite low average sick days, women’s morbidity rate is much higher (1.14 times) than men. This may be mainly due to unplanned pregnancy, lack of frequent visit to doctors at the time of pregnancy, use of unskilled birth attendants, lack of awareness about female health issues and child marriage. Another possible reason can be women’s ignorance in using sanitary latrines (1.15 times lower than men).

Smaller loading values for this indicator necessarily signify that this livelihoods asset is less targeted by the development agencies. Our finding on sanitary user rate is much lower (loading is 0.429 and 0.373 for men and women respectively) than government’s reported rate of 66.6% (MOF, GoB, 2013). We believe, training regarding family planning, maternal health, nutrition, use of sanitary latrine, and child bearing is necessary for rural people. As government lacks field level workers, intensive NGO involvement can help in conducting training session for the stated purposes.

Result shows that women are more efficient in utilizing their credit as income creation per month is much higher for women than men (1.22 times more). However, it was also found that saving/month for women is much lower (1.85 times). The probable reason (as mentioned by many respondents) behind this contradictory finding is women’s higher loan repayment rate compared to men (2.13 times higher). In addition, it was also reported that the rate of interest charged by MFIs are so high that it is difficult for beneficiaries to save a substantial enough after repaying loan instalment in time. The pressure of high rate of interest is reflected in degree of mental stress of the
borrowers. Our result suggests that loading for mental stress is very high for both men (0.622) and women (0.821) and especially for women (1.32 times more). Many female borrowers reported that they need to repay the instalment in time even if they remain unfed. Moreover, often male members of household use the loan secured by women and refuse to pay the instalment, and so women must use most of their savings (if any) for repayment purposes. This is another significant reason behind higher mental stress and lower rate of savings.

Income and saving pattern as discussed above are also evidenced in land holding size where men own better sized lands. However, interestingly it was found that rural men lost their land ownership (loading is -0.409) significantly. There are two possible reasons for such finding: 1) many men sold their lands to repay the instalment, and 2) many of them sent their next generation to urban areas and helped their migrant members to start a small business by selling lands. As land ownership is a symbol of social status in rural Bangladesh, women’s better land holding status is an evidence of empowerment.

Our study finds that on average women borrow smaller amounts (loading is 0.84 for men and 0.65 for women), which supports the existing literature (Susy and Kuhn, 2002). Many women reported that even though they had been borrowing for longer than men and their repayment rate is much higher, MFI’s usually provide bigger loans to men. Women also mentioned that they believe loan size matters and by taking bigger size loans they can generate more surplus thus can accelerate poverty reduction rate. A prior consultation of the managers of MFI’s with the borrowers can help to determine the actual loan size.

Feeling of insecurity among men is much higher (1.10 times). At the time of survey many of them expressed that most MFI’s prefer to provide loans to women and thus men feel that they have less chance to get out of poverty due to lack of credit support. We think credit should be given based on need not based on gender of the poor. In addition, rural men reported that they are often the victims of political instability with which they have no connection. Many at times these men are abused by local law enforcement agencies and rural elites. In the coastal areas (southern part of the country) many men said that they became vulnerable and feel unsecured after their lands had been destroyed by river erosion. In northern part of the country men reported that their income becomes unsecured at the time of prolonged Monga.*

Our results suggest that women are better off in making decisions at jobs which is mainly due to better income generation through microcredit. It was also found that food intake/day by kids is much better (loading for men and women are 0.563 and 0.862 respectively) in female-headed families. This finding proves that women spend more money on family compared to men.

Finally, results for vote casting by male and female and voting preferred candidates were found to be satisfactory which signal better awareness among rural people. Both men and women believe that their vote and voice are important for national as well as grass-root level development.

CONCLUSION

This paper offers a multidimensional livelihoods asset model for rural Bangladesh that is customized to local priorities. Thus, this study significantly contributes to the DFID’s sustainable livelihoods approach. The study also offers a livelihoods asset pentagon-based study to compare the degree of livelihoods achievement between men and women in rural Bangladesh. It has been observed that despite large amount of credit disbursed to women, they are worse off in achieving financial sustainability compared to men. However, women’s achievement in social capital especially decision making at jobs, freedom of performing cultural works, vote casting and access to different types of information is worth notable. Men’s feeling of insecurity due to lowness of income and abuse by local law enforcement agencies and trouble of getting financial support from MFI’s are issues need to be addressed immediately. Higher morbidity and mental stress of both the groups are alarming too. By considering the findings of the study, following recommendations can be considered:

a) More concentration is required on human capital building to reduce morbidity and average sick days/month as for many rural poor their body is the only source of income. Government and NGOs may setup small health centres in rural areas to offer low cost health care services along with family planning and maternal health trainings.

b) Involving civil society to conduct frequent meetings with rural people may help creating political and human rights-relevant awareness especially among women thus better achievement of social capital can be ensured.

c) Savings creation (thus achievement of financial capital) should be of priority for both the groups. Reduced and flexible rate of interest on borrowing plus customized credit terms (lower rate of interest for disabled and physically challenged poor) may help in this regard.
d) In order to help achieving better physical capital, awareness creation regarding use of sanitary latrine should be of another priority. NGOs with their wider coverage and large workforce may help in this issue.

Future researchers can: 1) work on non borrowers and offer another customized livelihoods asset model for them, 2) develop a livelihoods model for urban poor, 3) detect the changes in livelihoods asset requirements over time, and 4) develop similar models for other developing countries of the world and investigate the applicability of DFID’s livelihoods approach.

ENDNOTES

1 For a list of works, see, Neely, Sutherland and Johnson (2004)
2 In his human capability approach, Sen (1985) outlines the need for assets, commodities and services as important aspects of an acceptable standard of living, and the inability to access or acquire the stated requirements as the main cause of poverty.
3 Currently $1 per day baseline.
4 For example, Rowntree’s (1901) physiological approach, basic needs approach as illustrated by Streeten (1975); the social exclusion approach by Townsend (1979); UNDP’s human development approach and human rights approach. For further details, see McGillivray & Noorbakhsh (2007).
5 Sustainable livelihoods guidance sheets also recommend that the asset or capital requirement should be investigated case by case.
6 Hossain (2009) shows that both extreme and moderate poverty reduction rates are negative in recent years with rates of -1.2% and -1.7% respectively. In addition, the study explored that between 2004 and 2007, 30% of households were unable to rise above the poverty line, while another 19.2% moved from non-poor to poor.
7 This is termed within the model as people-centered and participatory (DFID, 2000).
8 Detailed discussion on vulnerability in the context of Bangladesh can be found in the study of Twigg (2009).
9 There are several studies on other fields (such as fisheries, marketing, irrigation systems, urban and rural development etc.) using SAL that have been done for Bangladesh. See for example, Neely, Sutherland and Johnson (2004); Ahmed (2009).
10 The list is based partly on the indicators listed in the DFID’s model. However, to extend the list of indicators, several cross-country studies have also been examined. For further details, see works of WeD (2007); McGillivray & Noorbakhsh (2007).
11 There was no open-ended qualitative question in the questionnaire. However, during face to face surveys, additional relevant qualitative comments and opinions of beneficiaries were noted which were also utilized to validate the quantitative findings of the paper.
12 For example, degree of poverty, presence of natural calamity (flood and drought), soil characteristics, occupations, agricultural labour size of the households, land-holding patterns, tenancy patterns, percentage of agricultural farms in the areas, literacy rate, crude birth and death rate, wage rate, time to travel from capital city and agricultural productivity. Factors are based on the poverty maps proposed by Bangladesh Bureau of Statistics, the World Bank and World Food Program. See for reference: http://home.wfp.org/stellent/groups/public/documents/liaison_offices/wfp201528.pdf (accessed on 14/3/2014).
13 Exploratory factor analysis (EFA) is a statistical method that helps determining underlying dimension for a set of measured items (or assets).
14 That is based on eigenvalue rule. The procedure considers the total number of dimensions until the eigen value drops below 1.
15 Similar rules were followed in the Marketing literature by Shimp & Sharma (1987); in Research methodology by Hair et al, (2009).
16 CFA allows the researcher to test the hypothesis that a relationship between the observed items and their underlying dimension(s) exists. CFA tests whether a specified set of dimensions is influencing responses in a predicted way.
17 Preferred values for the Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), Root means residual (RMR), p, Root Mean Square Error Estimation (RMSEA) and Hoelters are 0.90+, 0.90 +, less than 0.50, 0.50+, less than 0.05, and 200+ respectively.
18 Similar findings can be seen in DFID’s Sustainable Livelihoods Model, where vulnerability is not considered as a dimension of poverty.
19 For example, outcome assets of economic livelihoods are income per month, savings per month and use of sanitary latrine; examples of outcomes of asset-building are home ownership patterns, land-holding size and land-holding status (whether bought new or sold or owned through inheritance).
20 The chi-square value dropped to 523.331 from 1026.214 in the preliminary model. Hoelters values are 298 and 310 which are greater than 200. AIC and ECVI are both lower than the independence model. CFI, GFI, RMR, RMSEA and P value of 0.931, 0.912, 0.059, 0.046 and 0.911 respectively.
21 In the case of the structural model, Cronbach’s Alpha is often underestimated or under-reported (Arbuckle, 2009) thus we used the Coefficient H value.
Invariance checked model guarantees that the model and its items are equally applicable for men and women. Detail results of the invariance test is not provided here. Results of the tests can be made available upon request.

This finding supports the finding of the study by Amin (2003).

Monga is seasonal food insecurity in ecologically vulnerable and economically weak parts of north-western Bangladesh, primarily caused by an employment and income deficit before Aman (Rice grown in monsoon) is harvested.

REFERENCES


APPENDIX

FIGURE A1. MEASUREMENT MODEL FOR LIVELIHOODS ASSETS IN RURAL BANGLADESH