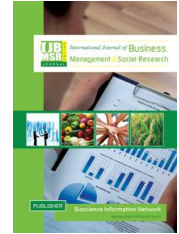


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## Livelihood status of hill dwellers in Bandarban, Bangladesh

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### ABSTRACT

*Bandarban hill district is of great importance for growing various crops, which are different from the plains. Farmers practice traditional Jhum culture for their livelihood. They slash and burn the vegetation on hills and go for Jhum cultivation without adopting any conservation measures which contributes to soil and nutrient loss. It can also lead to land degradation as the fallow periods needed for the recovery of natural resource is reduced due to population pressure. A Questionnaire based survey in six upazila of Bandarban revealed that the hill dwellers are lagging behind in education, farming knowledge, access to information on modern culture, modern inputs and government loan facilities. Their food security is at stake as they can seldom produce enough food for their consumption. An eco-efficient smallholder crop production system involving conservation techniques for the sustainable management of vegetation, soil, and water resources in drought-prone hillsides is urgently needed for sustainable livelihood of hill dwellers.*

**Key Words:** Hill dwellers, Jhum culture and Livelihood

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### I. Introduction

Chittagong Hill Tracts comprising the three districts of Bandarban, Rangamati and Khagrachhari has an area of 13181 sq. km. endowed with natural beauty and high economic potentiality. The tribal along with the Bengali people are living there for long maintaining their distinct socio-cultural identities and harmony. The area is hilly with mild to very steep slopes (from 15% to over 70%) often breaking or ending in cliffs. More than 90 percent of the area is covered by hills with only 129,000 hectares (ha) of cropped land. About 87 per cent of the land is covered with forest (totaling 11,475 sq. km.) mostly owned by the government (Dasgupta and Ahmed, 1998). Presently, it is increasingly becoming denuded due to unplanned management of hills and agricultural practices at steep slope without any conservation measure. According to Banglapedia (2009) about 20,000 hectares of land are being brought under Jhum cultivation every year. This traditional cultivation practice has been the only way of subsistence agriculture practice for many of the CHT people specially who are living in remote places. It is estimated that about 40,000 households are engaged with Jhum cultivation in CHT (Ullah et al. 2012). Jhum cultivation, sloppiness, heavy rainfall and improper management of soil enhance

nutrient depletion through erosion. Accelerated soil erosion is the greatest hazard for the long term maintenance of soil fertility. Tripura and Harun (2003) carried out a survey to observe the dependency rate of community on jhum cultivation, past and present status of jhum cultivation, its alternatives, and socio-economic status of jhum cultivators. Gafur et al. (2003) carried out a research to find out runoff and losses of soil and nutrients from small watersheds under shifting cultivation in the CHT. Borggaard et al. (2003) carried out a study to analyze the sustainability appraisal of shifting cultivation in CHT. Dewan (2008) conducted a survey work to analyze the socio-economic status of Jhum cultivators. The Chittagong Hill Tracts region is of great importance for growing various crops, which are different from the plains. But unfortunately no permanent and systematic agriculture practices have so far been developed. Slash and burn practices, also known as shifting cultivation, swidden agriculture, or simply jhum, is an ancient form of agriculture practiced by 200 to 500 million people around the world currently. Tripura and Harun (2003) carried out a survey to observe the dependency rate of community on jhum cultivation, past and present status of jhum cultivation, its alternatives and socio-economic status of jhum cultivators. Dewan (2008) conducted a survey work to analyze the socio-economic status of jhum cultivators. Thus the study was undertaken to assess the present livelihood status of hill dwellers in Bandarban hill district to help the planners to come up with appropriate development programs.



Picture 01. Slash and burn for Jhum culture.

## II. Materials and Methods

Primary data has been collected by conducting a survey work with a well-prepared semi structured questionnaire. The questions were asked in traditional language (Chakma) but the answer written in English language. Data were analyzed by using SPSS version 10 software. Ruma, Lama, Thanchi, Ruwangchhari, Alikadam, Bandarban sadar upazila of Bandarban district. Total 120 farmers, of which 20 farmers were sampled from each upazila and interviewed during January to March 2015.

## III. Results and Discussion

### Age

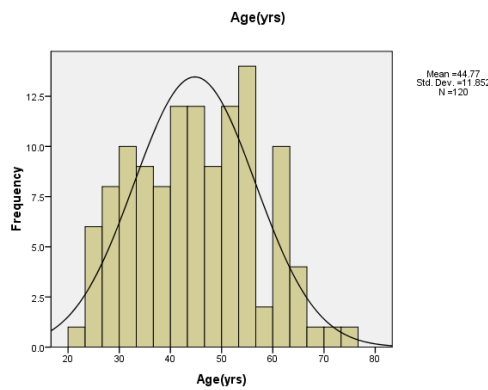
Farmer age ranged from 22 to 76 years. Most of farmers (46%) are of middle aged (35-50) followed by old (32%) and young (22%) (Figure 01).

Age group	Age (years)	Number	%
Young	Up to 34	26	22
Middle	35-50	55	46
Old	Above 50	39	32

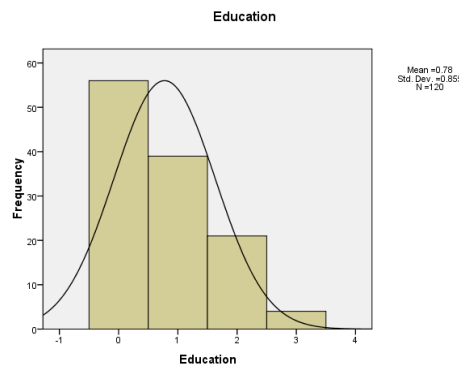
### Education

Out of 120 farmers 57 farmers (57%) were illiterate (Figure 02) followed by primary (39%) and secondary (20%) level of education. Only 3% of the respondent farmers had higher secondary level of education. According to a 2010 survey by the Bangladesh Bureau of Statistics (BBS), the literacy rate of Bangladesh is 59.82 percent.

Category	Level of education	Number	%
Illiterate	Unable to read and write	57	47
Primary	Class I to V	39	32
Secondary	Class VI to X	20	17
Higher Secondary	Class XI & XII	4	3



**Figure 01. Frequency distribution of farmer age.**

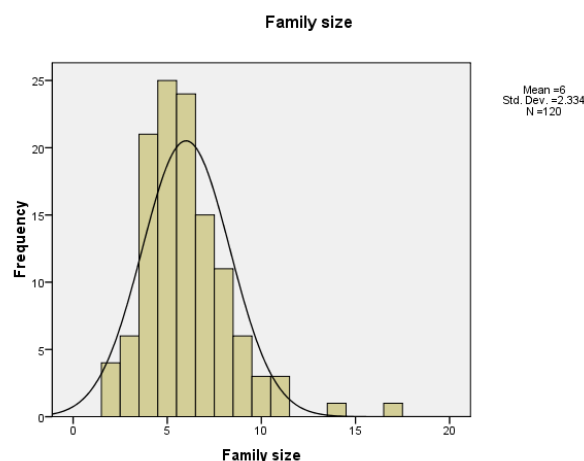


**Figure 02. Frequency distribution of farmer education.**

**Family size**

Family size ranged from 4 to 17 members. Most of the respondents (53%) have medium sized family (5 to 7 members) followed by small and large family. The average household size in Bangladesh is 4.4 persons per family, down from 4.8 in 2001 and 5.5 in 1991 (HEIS, 2005).

Category	Family size (number)	Number	%
Small	Up to 4	32	27
Medium	5 to 7	64	53
Large	Above 7	24	20

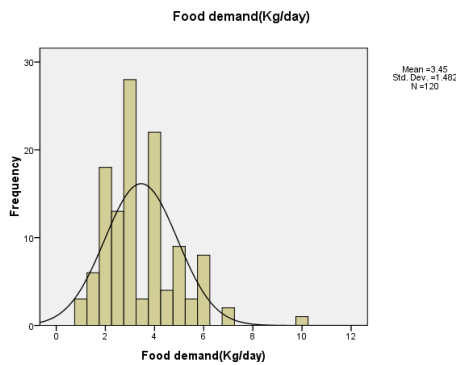


**Figure 03. Frequency distribution of family size.**

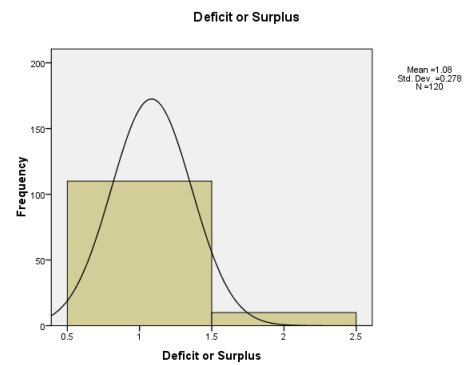
**Food**

Daily food demand (rice) is 0.5 kg per capita. Most of the family reported to be of food deficit. Rasul (2002) reported that poverty is widespread in the CHT particularly in rural areas. Many rural families suffer from chronic food shortages. On an average, shifting or Jhum cultivation cannot support a family for more than six months (ADB, 2001). Study revealed that 24.5 %, 36.7 % and 38.9 % households in

all ethnic groups have high, moderate and low level of food insecurity respectively, while 46.7 %, 27.8% and 25.6% non-ethnic households in high, moderate and low level of food insecurity, respectively. On average, per household per annum food (rice) shortage was found higher (0.87 ton) for non-ethnic and lower for ethnic households (0.49 ton) which constitutes 84.5% and 45.9%, respectively (Jamal Uddin et al. 2010). Food insecurity is a great concern in CHT where it sometimes becomes very difficult to arrange three meals particularly for medium or big families.



**Figure 04. Frequency distribution of food demand.**

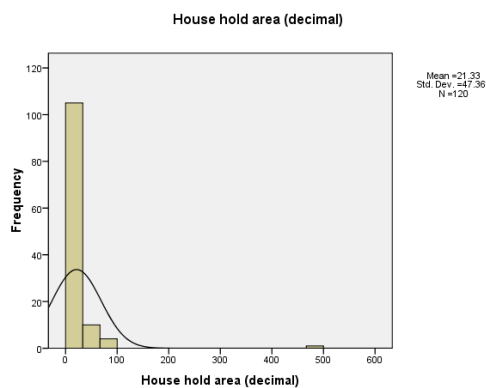


**Figure 05. Frequency distribution of food security**

**Homestead area**

Most of the family (80%) is reported to have smaller homestead area (1-20 decimal) with few having larger homestead area (>60 decimal).

Category (decimal)	Number	%
Up to 20 decimal	96	80
21 to 40 decimal	13	11
41 to 60 decimal	6	5
Above 60 decimal	5	4



**Figure 06. Frequency distribution of homestead area.**

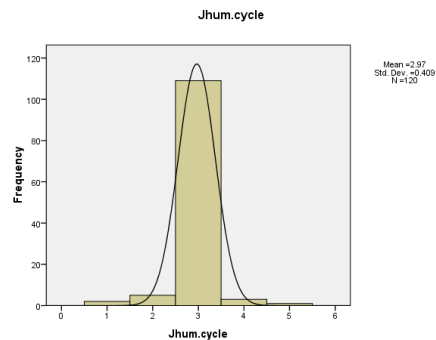


**Picture 02. Homestead area of hill dwellers.**

**Jhum cycle**

Jhum cycle means the fallow period of shifting cultivation. In the past most of the farmers followed a cycle of more than 6 years. In the current survey it was observed that jhum cycle in most cases

reduced to 3 years (Figure 07). Chakma and Nahar (2012) observed that of the respondents (about 80.00%) practiced fallow period  $\leq 3$  years for shifting cultivation and the rest of the respondents said that they practiced 4-6 years for jhum cycle. Many studies have demonstrated that weeds become more problematic when the fallow is short (de Rouw, 1995; Dingkuhn et al. 1999). When the fallow period goes below 3-4 years, soil fertility is not renewed, and erosion and weed competition increase dramatically (Van Keer, 2003).



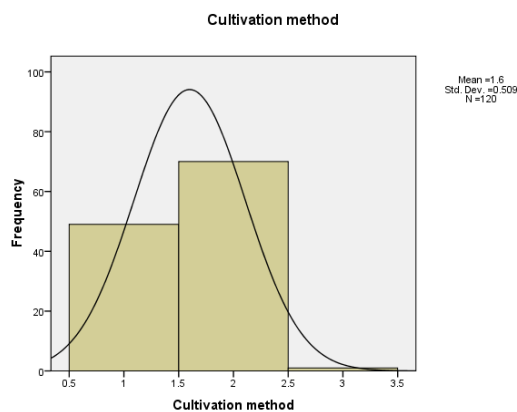
**Figure 07. Frequency distribution of Jhum cycle interval.**

### Cultivation method

Most of the farmers reported that they usually cultivate along the slope of the hill for easy operation. But this in return encourages soil erosion as rain water erodes top soils down the slopes.

### Land clearing practice

Farmers mostly use slash and burn method for clearing the land for jhum culture. Thus the denuded hills become susceptible to water erosion after the onset of monsoon. Jhum is the major agricultural practice in hilly areas occupying about 32000 ha/yr and average soil loss from Jhum is 40-45 t/ha/yr, the highest being observed in steep (33-42%) slopes and the lowest in gentle slopes (15%) (Shoaib et al. 1998).



**Figure 08. Frequency distribution of method of cultivation.**



**Picture 03. Cultivation along the hill slope.**

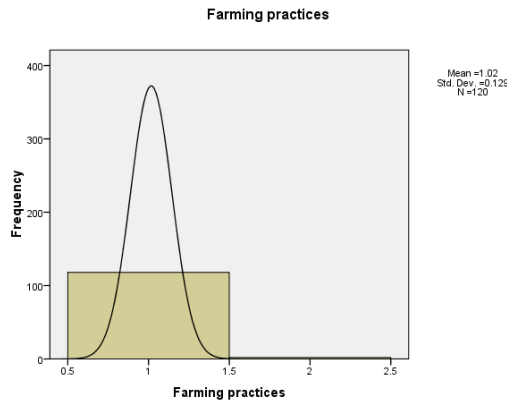


Figure 09. Frequency distribution of farming practice.



Picture 04. Denudation of hill slopes for jhum culture.

**Fruit trees and timber trees in homestead area**

Most of the farmers have fewer fruit and timber trees (<10) in homestead areas.



Figure 10. Frequency distribution fruit trees in homestead.

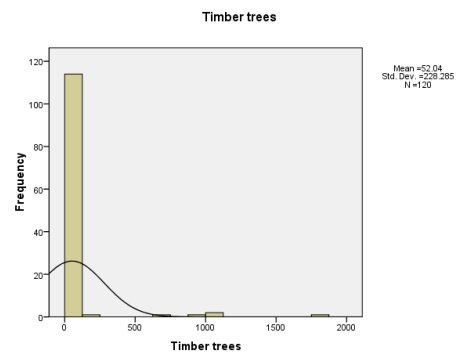
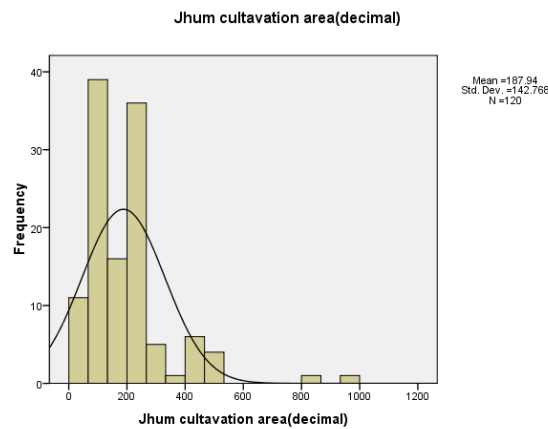


Figure 11. Frequency distribution of timber trees in homestead.

**Jhum area**

Most of the farmers (48%) have 101-200 decimal of Jhum cultivated area (Figure 12). 32% have 101 to 200 decimal Jhum areas. Few farmers have >400 decimal for Jhum culture. In a similar study in Rangamati, Chakma and Nahar (2012) found that about 60% of the respondents have only 1-2 acres of land for jhum cultivation and 25% of the respondents have 2.1- 3 acres of land.

Category (decimal)	Number	%
Up to 100 decimal	32	27
101 to 200 decimal	58	48
201 to 400 decimal	23	19
Above 400 decimal	7	6



**Figure 12. Frequency distribution of Jhum area.**

### Crop mixture in Jhum culture

Rice, Maize (locally known as makka), Sesame, Chili, Sweet gourd, Ashgourd, Marfa (cucurbit), Cotton, Turmeric and Zinger are dominant crop species. Farmers mainly use seeds of local variety that is why they could seldom harvest a good crop.

### Problems faced by farmers

**Unavailability of quality seeds:** Due to remote communication farmers have little or no access to modern variety seeds. About 60% of the farmers mainly use the seeds they preserve for themselves. Other farmers buy seeds from neighbor or market.

**Knowledge gap due to poor access to information:** Due to remote communication and scarce opportunity to communicate with extension workers they lack knowledge on modern way of crop culture in sloping lands. Usually they dibble (sow) seeds along the slope which encourages soil erosion.



**Picture 05. Admixture of seeds for Jhum culture.**

**Unavailability of credit facility:** Farmers have little or no access to institutional credit facility.

**Rodents or animal attack:** Most of time farmers incur loss due to rodents or animal attack in their jhum fields, and

**Soil erosion or loss of soil fertility:** Farmers also responded that they get poor yield due to loss of soil fertility due to top soil loss.

## IV. Conclusion

Slash and burn practices, also known as shifting cultivation or swidden agriculture, or simply jhum, is an ancient form of agriculture practiced by millions of people around the world currently. This traditional cultivation practice has been the only way of subsistence agriculture practice for many of the CHT people specially who are living in remote places. Food insecurity is a great concern in CHT where it sometimes becomes very difficult to arrange three meals particularly for medium or big families. They slash and burn the vegetation on hills and go for Jhum cultivation which contributes to

soil and nutrient loss. It can also lead to accelerated land degradation as population pressure reduces the fallow periods needed for the recovery of natural resources. Present study revealed that the hill dwellers are lagging behind in education, farming knowledge, access to information on modern culture, inputs and loan facilities. As such they could seldom produce enough food for their consumption. An eco-efficient smallholder crop production system with conservation techniques for the sustainable management of vegetation, soil, and water resources in drought-prone hillsides is urgently needed for sustainable livelihood of hill dwellers.

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