

**Trade-offs between forest conservation and livelihoods of the forest dependent people in the Chittagong Hill Tracts: REDD+ strategy development in Bangladesh**

**Project ID: 13284-2**

**Final report**

By

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## **Background of the project**

Forestlands make up almost 18% of the total lands in Bangladesh where natural forest accounts for about 31% (FAO 1998). REDD+ is now a central topic of research and discussion in the arena of climate change mitigation and forest conservation. The financial incentives for REDD+ in many pilot projects established in several countries have been found to alter the drivers of land use changes by reducing opportunity costs of retaining forest cover, and as multipartite solutions that not only generate profits and reduce carbon emissions, but also provide benefits for human development and biodiversity (Carlson & Curran 2009). The importance of traditional ecological knowledge, usufructs of the forest dependent peoples has been emphasized for the successful implementation of REDD+ (Mellick 2010). Bangladesh has no pilot project on REDD+. Some parts of tropical semi-evergreen forests in the CHTs in Bangladesh is severely deforested and degraded. REDD+ can potentially conserve forests and mitigate climate change. So, it concerns a research question what is the tradeoffs between forest conservation and livelihoods of the forest dependent peoples which can be incorporated while planning for the REDD+ project in the CHTs. The present proposed study aims at answering this research question.

## **General objectives of the study**

The general objective of this research project is to visualize trade-offs between forest conservation and livelihoods of the forest dependent three ethnic communities in the Chittagong Hill Tracts of Bangladesh.

## **Specific objectives of the study**

- Identification of TEK for vulnerability reduction in their livelihood
- Shorting out the alternative livelihood practices which can be used while implementing REDD+
- Identification of tradeoffs between forest biodiversity use and expected carbon benefits of the peoples

## **Achievement of the project**

The visualization of trade-offs between forest conservation and livelihoods of the forest dependent peoples considering forest biodiversity use and livelihoods vulnerability have contributed understanding the range of involvement of the peoples for forest conservation. Identification of trade-offs between forest biodiversity use and carbon benefits will contribute to sharing the carbon benefits with the forest peoples. Identifying alternative livelihoods will be important for diverting forest dependent peoples from overusing the natural forests. All of these will contribute adopting REDD+ program in the selected forest areas of Bangladesh along with the conservation of forest biodiversity and livelihood development of the forest dependent peoples.

## **Methodology and activities**

The study has been conducted in Khagrachhari Sadar, Dighinala and Mohalchari Upazila<sup>1</sup> of Khagrachhari district under Chittagong Hill Tracts (CHT) of Bangladesh through stratified random sampling technique. The ultimate sampling units were the households dependent on the Village Common Forests (VCF) under tropical semi-evergreen forest ecosystem. The study /awareness program was conducted from March 2013 to December 2014 involving a complementary ethnographic analysis and socially and culturally sensitive TEK (Traditional Ecological Knowledge) gathering method. The study included physical observation and ethnographic field notes. However, it consisted of structured and semi-structured data gathering of community-based information. For the study, TEK of three tribal communities, Chakma, Tripura and Marma living inside the tropical semi-evergreen forests were sampled purposively. The total area of Khagrachhari district is 2749.16 km<sup>2</sup> of which around 82% of the lands are covered by forests, though having deforestation and degradation in most parts of the area. The population Census 2011 shows that the major ethnic groups living in the Khagrachhari district are Chakma, Tripura and Marma representing 51%, 27% and 21%, respectively, of all the ethnic populations (BBS 2012). As each of the ethnic communities has the separate entity regarding their forest dependence culture, the three communities were considered as different strata in this study. Our study incorporated the samples of each 60 households from Chakma and Tripura and 37 from Marma community. We had a target to sample 60 households from the Marma tribe also, but we did not find enough forest dependent Marma communities in our study areas. The natural forests the communities were dependent were Komolchari, Golabari, Boalkhali, Nonachari, and Bangalkathi VCF.

A reconnaissance survey on March 2013 was the first step to obtain an overview of the forests and ethnic communities in the Khagrachhari district of the Chittagong Hill Tracts of Bangladesh. We commenced the final survey from April 2013. I started inputting data into the SPSS statistical package 17.0 and analyzing since June 2013. Under the awareness program, we observed the World Environment Day 2013 on 5<sup>th</sup> June 2013 (the report-documentation is as below). In Khagrachhari district, we conducted six awareness programs on forest conservation and REDD+ in the meantime.

### **Observation of the World Environment Day 2013**

As the awareness campaign, my project participated in the World Environment Day 2013 on 5<sup>th</sup> June 2013 in joint collaboration with the Institute of Forestry and Environmental Sciences, Chittagong University (IFESCU). At 10:30 am, my project including its team members with the banner and play-cards, participated in the environmental rally inside the campus of University of Chittagong. The Vice-Chancellor (Acting) (Professor Dr. Imran Hossain) and Pro-Vice Chancellor (Professor Dr. Iftekhar Uddin Chowdhury) of University of Chittagong, Director and other colleagues of IFESCU, along with hundreds of students attended the environmental rally. The banner and the play-cards mentioning the title of my project were embedded by the logo of the Rufford Foundation. After the rally at around 11:15, we joined a tree plantation program in front of the Social Science Faculty of University of Chittagong. After that I participated in a seminar in the conference room of IFESCU with my project banner. I was a keynote speaker there. I presented the findings of my previous project (Traditional Ecological Knowledge in the REDD+ Strategies in Bangladesh, RSG reference 9912-1) in the seminar. However, the title of the paper presented was 'Forest dependence of

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<sup>1</sup> Local government unit under a district

Chakma community in Rangamati: Scaling up REDD+ strategies in Bangladesh'. In the plenary session of the seminar, honorable Vice Chancellor and Pro-Vice Chancellor of University of Chittagong talked on the light of this paper and especially on conservation of forests and heritage. After that I presented my paper where I had to face many questions and comments. The designated chief discussant on this paper was Mr. SM Munirul Hasan, Associate Professor, Department of Sociology, and University of Chittagong. The designated and undesignated discussion on this paper gave me a fine tuning methodology of my present project and awareness campaigns on forest conservation in Bangladesh. All costs of the seminar organization were born by my project. Some focus photographs on this World Environment Day 2013 have been shown here.

## **Project report**

### **Summary**

Reducing emissions from deforestation and forest degradation, and enhancing forest carbon stocks (REDD+) can simultaneously conserve the forests and mitigate the global climate change. In the REDD+ implementation phase, there is an obvious issue to refrain the forest dependent people from using the neighboring natural forests. However, refraining the forest dependent people from all the forest service and products might be unrealistic and might hamper the success of REDD+ programs. It is, therefore, important to understand the trade-offs between forest use and REDD+. The present project considered three ethnic communities, i.e., Chakma, Marma, Tripura, of the Khagrachari district of Chittagong Hill Tracts (CHT), Bangladesh, for understanding this trade-offs. The study has been conducted in Khagrachhari Sadar, Dighinala and Mohalchari Upazila of Khagrachari district under Chittagong Hill Tracts (CHT) of Bangladesh through stratified random sampling technique. The ultimate sampling units were the households dependent on the Village Common Forests (VCF) under tropical semi-evergreen forest ecosystem. The study /awareness program was conducted from March 2013 to December 2014 involving a complementary ethnographic analysis and socially and culturally sensitive TEK (Traditional Ecological Knowledge) gathering method. The study incorporated the samples of each 60 households from Chakma and Tripura and 37 from Marma community. The study revealed that average family size of the selected tribes was four members. Analysis of households' income indicates that the average income of the households was 71297 tk yr<sup>-1</sup>. The average total land resources owned by each household was 0.78 ha, of which average 0.22 ha was in the homestead, 0.35 ha was under jum (shifting) cultivation. The average number of people entering into the forests per day per household was 1 and the mean distance of the forests from the households was 1.68 km. 29% Chakma respondents and 93% Tripura respondents claimed that only reduced extraction was an effect of the forest degradation on the livelihood. When there will be no firewood in the forests, about 45% Chakma, 47% Marma and 29% Tripura respondents will extract firewood from others' plantation. The percentages of choosing Forest Based Small Scale Enterprise (FBSSE) as an alternative livelihood practice when natural forests will be prohibited was 59% for Tripura and 33% for both Chakma and Marma communities. Most of the respondent's expectation was cash compensation from the government when the neighboring forests will be prohibited and the percentages were 63% for Chakma, 53% for Marma and 47% for Tripura. Average 96% of respondents claimed that the important service from the forests that never can be sacrificed by the community people was water. The other important services of the forests never can be sacrificed by the community people were medicinal plants, rituals on forest, firewood, and vegetables and spices with the average percentages 80%, 74%, 40% and 39%, respectively. The project found important traditional uses of forests, which must be taken into consideration when initiative will be taken to implement the REDD+ program in the CHT.

## Results and discussion

### Socio-economic background of the forest dependent people

In all the 14 villages, the average family size was four members (Table 1). Analysis of households income indicate that the average income of the households was 71297 tk yr<sup>-1</sup> where Modhu Para had the highest, 175666 tk yr<sup>-1</sup> and Sappai Para had the lowest, 44333 tk yr<sup>-1</sup>. In most of the households, 1 member per household were found income earner. Among the tribes, the income was not significantly varied.

*Table 1: Socio-economic background of the forest dependent households in Khagrachari district of the Chittagong Hill Tracts of Bangladesh.*

Name of the tribe	Name of the village	Family size	Literacy score of the family	Number of earning members	Total income per family (tk yr <sup>-1</sup> )
Chakma	Buddha Para	3.00±1.00	5.00±1.00	1.50±.50	40000.00±5000.00
	Komolchori Reserve Para	4.37±.32	1.61±.75	1.13±.12	44500.00±5961.18
	Sappai Para	4.33±.41	3.00±.49	2.17±.32	44333.33±2199.63
	Beltoli Para	4.50±.25	2.64±.20	1.00±.00	64285.71±1645.60
	Ranga pani chora Sath vaiya Para	4.55±.41	2.00±.23	1.00±.00	65454.55±1253.10
Marma	Beltoli Para	4.75±.25	2.50±.19	1.00±.00	65000.00±1636.63
	Sath vaiya Para	4.33±.33	3.00±.45	1.00±.00	65000.00±2581.99
	Modhu Para	6.00±1.53	3.33±1.67	1.00±.00	175666.67±23311.89
	Ghugrachori	4.42±.25	3.16±.35	1.11±.07	65526.32±1617.46
Tripura	Buddha Para	4.53±.22	2.39±.26	1.86±.11	49472.22±1157.78
	Sappai Para	3.75±.25	2.00±.00	1.25±.25	45000.00±2041.24
	Jadhuram Para	5.33±.33	3.67±1.76	1.00±.00	150000.00±.00
	Chitto member Para	4.56±.14	1.81±.23	1.48±.10	48925.93±615.39

Note: US\$ 1= 80 tk

The average total land resources owned by each household was 0.78 ha, of which average 0.22 ha was in the homestead, average 0.35 ha was under jhum (shifting) cultivation. Average 0.21 ha was under non-jhum cultivation where the figure was zero in seven villages (Table 2). Considering the total lands, no significant difference was found between Marma and Tripura. But these two tribes were significantly higher in total land than that of Chakma.

Table 2. Distribution of land resources of the forest dependent people in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

Name of the tribe	Name of the village	Total homestead land (ha)	Total jum lands for agriculture (ha)	Total non jum lands for agriculture (ha)	Total land (ha)
Chakma	Buddha Para	.45±.36	.00±.00	.08±.08	.53±.45
	Komolchori Reserve Para	.29±.08	.29±.09	.00±.00	.58±.15
	Sappai Para	.38±.09	.23±.09	.35±.15	.96±.16
	Beltoli Para	.07±.01	.46±.04	.00±.00	.53±.04
	Ranga pani chora Sath vaiya Para	.07±.00	.48±.03	.00±.00	.55±.03
	Sath vaiya Para	.08±.00	.81±.00	.00±.00	.89±.00
Marma	Beltoli Para	.06±.01	.46±.03	.00±.00	.52±.03
	Sath vaiya Para	.07±.00	.52±.04	.00±.00	.59±.04
	Modhu Para	.47±.18	.00±.00	.85±.35	1.32±.51
	Ghugranchori	.08±.01	.51±.02	.00±.00	.59±.02
Tripura	Buddha Para	.13±.01	.46±.04	.08±.04	.67±.03
	Sappai Para	.38±.19	.33±.16	.71±.48	1.42±.52
	Jadhuram Para	.41±.00	.00±.00	.81±.00	1.22±.00
	Chitto member Para	.12±.02	.36±.05	.06±.03	.54±.05

### Access to the forests

Without the village Modhu Para the average number of people entering into the forests per day per household was 1 and the mean distance of the forests from the households was 1.68 km. The average time required for extracting forest products was 4 hours with the minimum 2.25 hours and maximum 5.56 hours (Table 3).

Table 3. Access to forests of the forest dependent people in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

Name of the tribe	Name of the village	Number of family member entering into the forest	Time required for extracting forest products (hours)	Distance of forests from the household (km)
Chakma	Buddha Para	1.50±.50	4.00±1.00	3.25±.25
	Komolchori Reserve Para	1.25±.16	2.25±.45	.38±.37
	Sappai Para	1.92±.15	5.33±.19	1.96±.18

Name of the tribe	Name of the village	Number of family member entering into the forest	Time required for extracting forest products (hours)	Distance of forests from the household (km)
	Beltoli Para	1.00±.00	3.00±.21	1.07±.10
	Ranga pani chora	1.00±.00	3.09±.09	1.05±.05
	Sath vaiya Para	1.00±.00	3.00±.00.	1.00±.00.
Marma	Beltoli Para	1.00±.00	3.25±.16	1.06±.06
	Sath vaiya Para	1.00±.00	3.17±.17	1.00±.00
	Modhu Para	2.33±.88	4.00±.58	1.83±.33
	Ghugrachori	1.00±.00	3.11±.07	1.03±.03
Tripura	Buddha Para	1.69±.08	5.56±.09	2.69±.11
	Sappai Para	1.25±.25	5.25±.48	2.50±.35
	Jadhuram Para	1.33±.33	3.33±.33	2.17±.17
	Chitto member Para	1.70±.09	5.48±.10	2.56±.07

### Effect of forest degradation on the livelihoods

29% Chakma respondents and 93% Tripura respondents claimed that only reduced extraction was an effect of the forest degradation on the livelihood (Figure 1). A very few people claimed only less income as an effect of the forest degradation on the livelihood. 54% Chakma and 89% Marma respondents claimed both less income and reduced extraction was the effects of the forest degradation on the livelihood. 13% Chakma, 8% marma and 4% Tripura told the effects of the forest degradation on their livelihood are reduced extraction, less income and wastage of time.

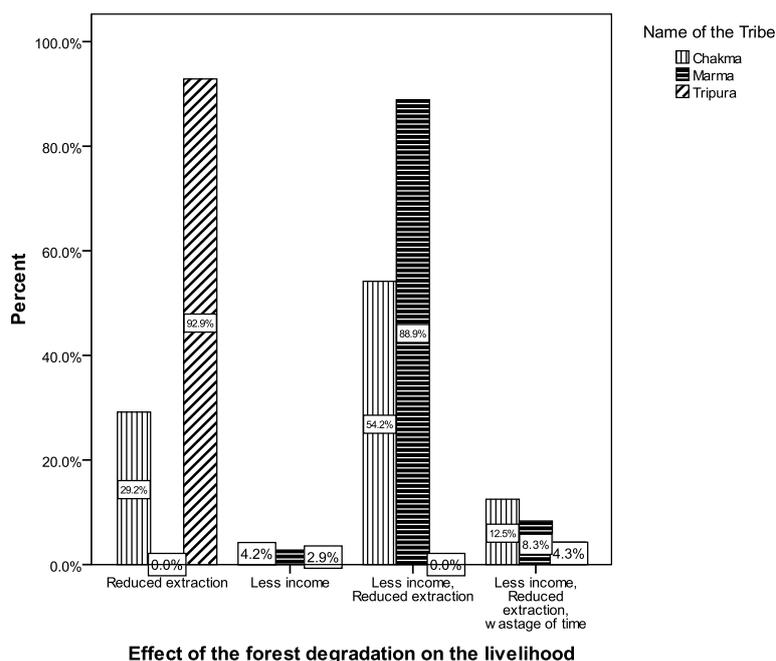
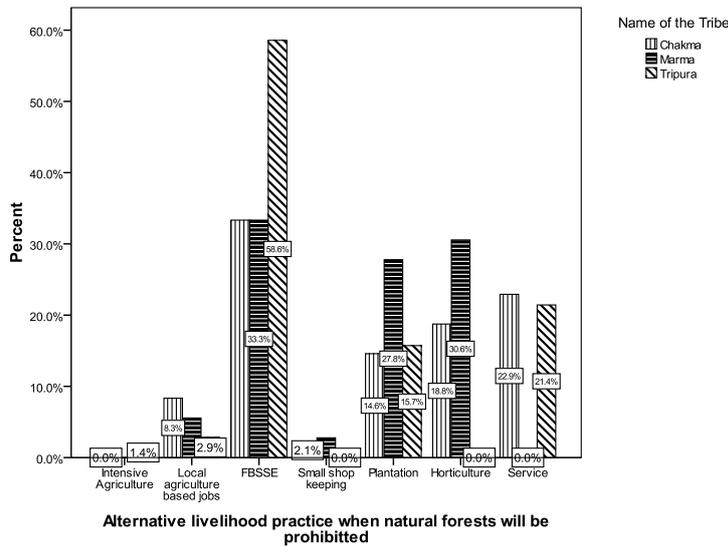


Figure 1: Effect of forest degradation on the livelihoods of forest dependent people in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

### Alternative cooking practice

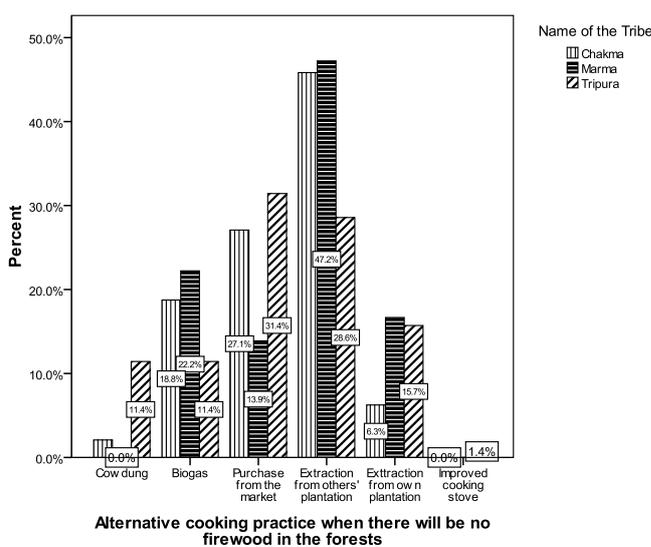
When there will be no firewood in the forests, about 45% Chakma, 47% Marma and 29% Tripura respondents will extract firewood from others' plantation (Figure 2). A few people picked purchasing firewood from the market, biogas and extraction from own plantation area as the alternative cooking practices when there will be no firewood in the forests. There were very little percentages of using cow dung and improved cooking stove as an alternative cooking practice in all the communities.



**Figure 2:** Alternative cooking practice of the forest dependent people in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

### Alternative livelihoods

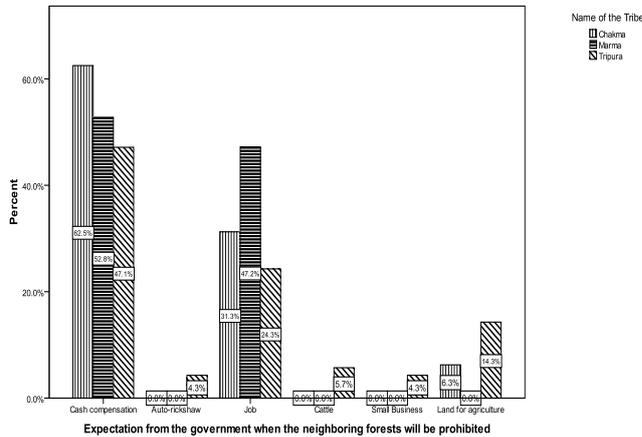
The percentages of choosing Forest Based Small Scale Enterprise (FBSSE) as an alternative livelihood practice when natural forests will be prohibited was 59% for Tripura and 33% for both Chakma and Marma communities (Figure 3). A few people picked plantation, horticulture and service as the alternative livelihood practices. The percentage was negligible for electing intensive agriculture and small shop keeping as the alternative livelihoods when natural forests will be prohibited.



**Figure 3:** Expected alternative livelihood practice, when natural forests will be prohibited, of the forest dependent people in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

## Expectations from the REDD+ authority

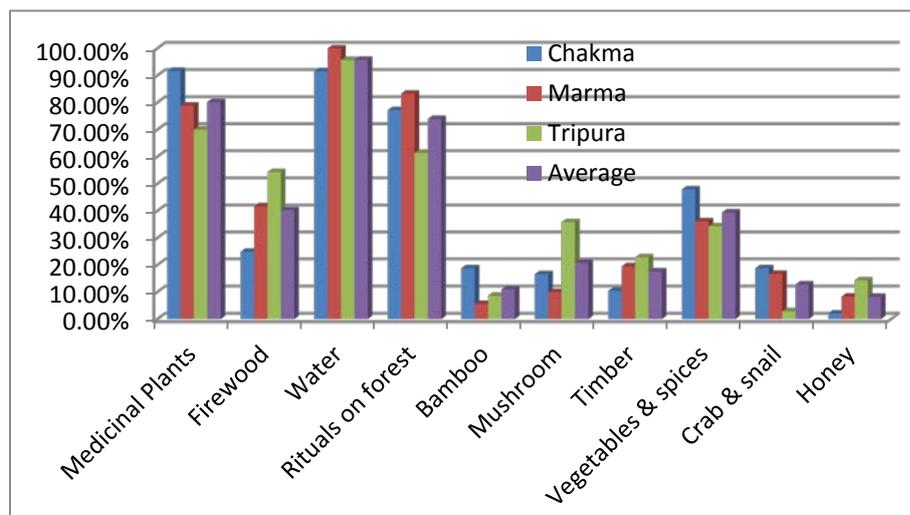
Most of the respondent's expectation was cash compensation from the government when the neighboring forests will be prohibited and the percentages were 63% for Chakma, 53% for Marma and 47% for Tripura. The percentages of job expectation from the government among the communities were 31% for Chakma, 47% for Marma and 24% for Tripura. The other expectations of the respondents were land for agriculture, cattle, small business and auto rickshaw. Their percentages of these expectations were negligible.



**Figure 4:** Expectation from the REDD+ authority, when the neighboring forests will be prohibited, of the forest dependent people in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

## Forest service never can be sacrificed

Average 96% of respondents claimed that the important service from the forests that never can be sacrificed by the community people was water. The other important services of the forests never can be sacrificed by the community people were medicinal plants, rituals on forest, firewood, and vegetables and spices with the average percentages 80%, 74%, 40% and 39%, respectively. There were poor percentages found for the services honey, bamboo, crab and snail, timber and mushroom. The average percentages of these services were 8%, 11%, 13%, 18% and 21%, respectively.



**Figure 5:** Forest services, which cannot be sacrificed, of the forest dependent people in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

## Traditional use of forests

The forest dependent households firmly opined that sacrifice of using forests for the purposes of water along with other services would be difficult to them. This traditional uses of the forests are described as below;

## Medicinal, religious and other uses

The study reveals that *Rawfolia serpentine*, *Musa sepientum* and *Ocimum sanctum* are the important medicinal plant species used by the Chakma community, while *Azadirachta indica*, *Heliotropium indium* and *Artocarpus lacucha* are popular in Marma and *Litsea glutinosa*, *Glycyrrhiza glabra* and *Agaricus bisporus* are popular in Tripura tribe (Table 4). The uses of the medicinal plants were reported as varying scale in the selected tribes. The respondents reported a huge number of medicinal plants. The study only showed the common medicinal plants used by the three tribes. Some of the species noted in the table 4 also were found to be used for religious and agricultural purposes.

Table 4. Plants used as medicinal and other purposes by the forest dependent Chakma, Marma and Tripura households in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

Species used as medicine	Dependence of the ethnic households (%)		
	Chakma	Marma	Tripura
<i>Adhatoda vasica</i>	52.23	45.68	56.87
<i>Agaricus bisporus</i>	18.35	19.54	56.85
<i>Artocarpus lacucha</i>	19.56	56.56	78.56
<i>Azadirachta indica</i>	54.45	78.25	65.25
<i>Bambusa tulda</i>	14.56	16.58	25.64
<i>Bambusa vulgaris</i>	5.68	7.89	10.25
<i>Calamus guruba</i>	15.89	17.89	19.58
<i>Calamus tenuis</i>	15.68	16.58	17.89
<i>Calotropis procera</i>	14.68	16.54	22.15
<i>Centela asiatica</i>	6.87	10.25	12.58
<i>Glycyrrhiza glabra</i>	10.25	55.85	56.98
<i>Heliotropium indium</i>	45.25	56.25	45.21
<i>Imperata cylindrica</i>	8.29	9.24	10.44
<i>Leonotis nepetifolia</i>	45.25	35.42	44.56
<i>Litsea glutinosa</i>	47.85	44.56	66.34
<i>Melocanna beccifera</i>	8.92	12.45	15.68
<i>Musa sepientum</i>	56.87	65.42	62.21
<i>Ocimum americanum</i>	45.85	35.41	28.74

<i>Ocimum basilicum</i>	25.36	35.28	42.58
<i>Ocimum sanctum</i>	55.68	32.14	26.87
<i>Rawfolia serpentina</i>	56.98	64.25	52.36
<i>Tamarindus indica</i>	35.62	30.24	26.45
<i>Thysanolaena maxima</i>	55.67	45.62	42.35

Note: Multiple responses present in the 'Dependence of the ethnic households (%)'.

Different parts of plants were reported to be used as offerings to different Goddesses and to the souls of the lately departed persons. The fruits of *Terminalia chebula*, *Terminalia belirrica* and *Emblica officianlis* were found to be used both as medicinal plants and religious purposes by all the three tribes. Wild boar (*Sus scrofa*) and Jungle fowl (*Gallus gallus*) were found to be used in the traditional social program. The other wildlife used by the three tribes were Indian bullfrog, ***Hoplobatrachus tigerinus***, Monitor lizard, *Varanus benghalensis*, Porcupine (*Hystrix indica*), Barking deer (*Muntiacus muntjak*), Sambar deer (*Cervus unicolor*), Squirrel (*Ratufa bicolor*), Tree frog (*Rana bimaculatus*), Python (Python reticulates), and Terrestrial tortoise (*Melanochelys tricarinata*).

The Chittagong Hill tracts in Bangladesh is rich in natural resources and cultural diversity, particularly in medicinal plants (Halim et al. 2007; Khan & Rashid 2006). The dependence of Marma and Mro tribes of the CHT on the forest medicinal plants was reported by Miah & Chowdhury (2003), and Alam (2002), respectively. The dependence of rural people of different countries, on the forest medicinal resources, were also reported by many other ecologists (Maikhuri et al. 2000 for India; Miah & Chowdhury 2004 for Bangladesh; Mohapatra 1997 for India; Mustafa et al. 2002 for Bangladesh; Namgyel & Ghimiray 1998 for Bhutan; Sene 2000 for Africa).

### Firewood

The study found that *Macaranga denticulata* was used by 65.41% households as firewood followed by *Grewia microcos* by 48.25% (Table 5). The percentage of the households of the three selected tribes using the forest tree species was not found significantly different. Hence, Importance of the firewood has been articulated by the general percentage including all the tribes.

Table 5. Tree species used as firewood by the forest dependent Chakma, Marma and Tripura households in the Khagrachari of Chittagong Hill Tracts of Bangladesh.

Species used as firewood	Households (%)
<i>Anogeiss acuminatus</i>	42.45
<i>Artocarpus chaplasha</i>	12.56
<i>Bischofia javanica</i>	14.25
<i>Bursera serrata</i>	45.24
<i>Dillenia pentagyna</i>	15.62
<i>Duabanga sonneratioides</i>	8.96
<i>Ficus hispida</i>	26.54
<i>Gariga pinnata</i>	45.65
<i>Grewia microcos</i>	48.25
<i>Macaranga denticulata</i>	65.41
<i>Mangifera sylvatica</i>	23.25
<i>Shima wallichii</i>	7.45

Species used as firewood	Households (%)
<i>Syzygium cumini</i>	36.45
<i>Terminalia belerica</i>	36.54
<i>Vitex peduncularis</i>	25.78
<i>Xylia kerrii</i>	25.55

Note: Multiple responses present in the second column

### Food services

Collecting wild fruits and vegetables from the natural forests was found indispensable to all the selected tribes. Among the wild fruits, *Syzygium cumini*, *Emblica officinalis* and *Bursera serrata* were found commonest popular wild fruits, while *Melocanna beccifera* and *Amonum subulatum* and *Colocasia esculanta* were found important vegetable species, for all the tribes. The Mro tribe of the CHT also has been reported to have the same food habit consuming the wild fruit and vegetables collected from the natural forests (Miah & Chowdhury 2004). The dependence of the rural people on forest foods has been reported by many ecologists in the world (Banik 1998; Jana & Chauhan 2000; Maikhuri et al. 2000; Samal 1997).

### Conclusion

The field observation shows that the forest dependent communities were mostly illiterate. Forest dependence was their cultural entity which was inevitable for their subsistence livelihoods also. For cash crop cultivation, they practiced *Juming* (shifting cultivation). The important objectives of their natural management were sustaining pure drinking water supply, medicinal use and cooking energy. Generally, all the tribes were found dependent on the natural forests having some differences in cultural practices. In the regime of REDD+ implementation in Khagrachari, refraining them from water harvesting, religious and medicinal use of the plants will be difficult. However, provisioning improved cooking stoves and alternative cooking fuels and providing alternative livelihoods may improve the REDD+ success in this area. The concerns from the local elites, community leaders, political leaders improved our understandings on the trade-offs between the forest use and the expected REDD+ program in this area. We tried to make a network among the local NGO activists, students, teachers, religious and political leaders, and environmentalist through our study and the awareness programs. It created an enthusiasm on REDD+ and forest conservation.

## References

- Alam MK (2002). Ethnobotanical Knowledge and Indigenous Non-Timber Food Crops for Sustainable Development of Upland Farming System in the CHTs. In: Farming Practices and Sustainable Development in Chittagong Hill Tracts (ed N. A. Khan) pp. 155-163. Chittagong Hill Tracts Development Board, Government of Bangladesh and Village & Farm Forestry Project-International Co-operation, Swiss Agency for Development & Cooperation.
- Banik RL (1998). Ethno-Botany of Bamboo and Rattan and Their Indigenous Management and Utilization in Chittagong Hill Tracts. In: Applied Ethno-Botany (eds R. L. Banik, M. K. Alam, S. J. Pei, and A. Rastogi) pp. 93-102.
- BBS (2012). Bangladesh Population and Housing Census 2011. <http://www.bbs.gov.bd>. Bangladesh Bureau of Statistics, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.
- Carlson KM, Curran LM (2009). REDD Pilot Project Scenarios: Are Costs and Benefits Altered by Spatial Scale? Environmental Research Letter 4.
- FAO (1998). Asia-Pacific Forestry Sector Outlook Study: Country Report - Bangladesh, APFSOS/WP/48 edn. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand.
- Halim S, Roy RD, Chakma S, Tanchangya SB (2007). Bangladesh: The Interface of Customary and State Laws in the Chittagong Hill Tracts. In: Bridging the Gap: Policies and Practices on Indigenous Peoples' Natural Resource Management in Asia (ed H. Leake) pp. 41-110. UNDP (United National Development Program)-RIPP(Regional Indigenous Peoples' Program) and AIPP (Asia Indigenous Peoples' Pact) Foundation, Chiang Mai.
- Jana SK, Chauhan AS (2000). Ethno-botanical aspects of legumes in Sikkim. Journal of Non-timber Forest Products 7(1-2): 46-52.
- Khan NA, Rashid AZMM (2006). A study on the indigenous medicinal plants and healing practices in Chittagong Hill Tracts (Bangladesh). African Journal of Traditional, Complimentary and Alternative medicines 3(3): 37-47.
- Maikhuri RK, Nautiyal S, Rao KS, Semwal RL (2000). Indigenous knowledge of medicinal plants and wild edibles among three tribal sub-communities of the central Himalayas, India. Indigenous Knowledge and Development Monitor 8(2): 7-13.
- Melick D (2010). Credibility of REDD and Experiences from Papua New Guinea. Conservation Biology 24(2): 359-361.
- Miah MD, Chowdhury MSH (2003). Indigenous healthcare practice through medicinal plants from forests by the Mro tribe in Bandarban region, Bangladesh. Indilinga 2(2): 59-74.
- Miah MD, Chowdhury MSH (2004). Traditional forest utilization practice by the *Mro* tribe in the Bandarban region, Bangladesh. Swiss Forestry Journal 155(3-4): 65-70.
- Mohapatra CR (1997). Podu: an Ecological Hazard. In: Forest Management in Tribal Areas (eds P. M. Mohapatra and P. C. Mohapatro) pp. 85-91.
- Mustafa MM, Siddiqi MA, Khan NA, Newaz MS (2002). An Empirical Study on the Jhum Farming System in the CHT. In: Farming Practices and Sustainable Development in Chittagong Hill Tracts (ed N. A. e. al. Khan) pp. 65-79. Chittagong Hill Tracts Development Board, Government of Bangladesh and Village & Farm Forestry Project-International Co-operation, Swiss Agency for Development & Cooperation.
- Namgyel P, Ghimiray AC (1998). Forest the Superstore: a Case Study of Rural Peoples' Dependence on Forest Resources in West-Central Bhutan. In: Applied Ethno-Botany (eds R. L. Banik, M. K. Alam, S. J. Pei, and A. Rastog) Bangladesh Forest Research Institute, Chittagong.

- Samal J (1997). Role of Forest in a Poor Resource Base Tribal Economy: a Micro Analysis.  
In: Forest Management in Tribal Areas (eds P. M. Mohapatra and P. C. Mohapatro) pp.  
105-124. Concept Publishing Company, New Delhi.
- Sene EH (2000). Forests and food security in Africa: the place of forestry in FAO's special  
program for food security. *Unasyuva* 51(3): 13-18.