

Participatory Forestry in Bangladesh

Practices among Selected Ethnic Communities
in Chittagong Hill Tracts

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Abdullah Al Mamun Chowdhury

Niaz Ahmed Khan



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Authors

Abdullah Al Mamun Chowdhury
Niaz Ahmed Khan

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Dedicated to

Omme Tahera Begum, Khorsheda Kabir
Ishika Nawrin Chowdhury, Ishraq Navid Chowdhury

With love and appreciation

Abdullah Al Mamun Chowdhury

Fatiha Munzarin Khan, Mustari Begum Khan

With love and appreciation

Niaz Ahmed Khan

About the Book

Due to regressive policies and management measures, the forests of the Chittagong Hill Tracts (CHT) in Bangladesh have been alarmingly degraded resulting especially in constrained livelihoods of the forest-dwelling ethnic communities. In order to combat the loss of forest and to reorient the trend of degradation towards progressive succession, Participatory Forestry (PF) emerged in Bangladesh in the 1980s.

In CHT, PF practices have originated and continued in the form of jhumia farmer rehabilitation on public land by the government organizations – notably, the Forest Department and Chittagong Hill Tracts Development Board. Non-government organizations (NGOs) have also practiced PF in projects targeting marginal jhumia farmers from long-established villages and jhum landholders under the traditional system of land allocation in CHT.

Based on a thorough empirical work, this study aims to explore and document the PF practices, and the individual and comparative performances, variations and relationships among and between the intervening government and non-government agencies, and the targeted ethnic communities in CHT. The research encompasses such aspects as general demographic issues, livelihood patterns and challenges, participation, poverty reduction, and inclusion. Policy and functional level recommendations are made based on the impacts and implications of the key findings and observations of the study in order to sustain and nurture future land-based resource management through PF farming practices in CHT.

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The research which informs this volume originated in the form of a doctoral study by Abdullah Al Mamun Chowdhury, and the work was co-supervised by Niaz Ahmed Khan. The original report has been considerably revised and abridged with a view to converting it into a literature targeted to a much wider audience, and ultimately producing this book.

We humbly express our gratitude to the Almighty, the Cherisher and Sustainer of the worlds, who has given us the tempo and ability to bring this volume to light.

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Abdullah Al Mamun Chowdhury
Niaz Ahmed Khan

Foreword

In the context of increased interest and enthusiasm about Participatory Forestry in Bangladesh, and in view of the special significance of the Chittagong Hill Tracts region and its people, a study focusing on the current state of community-oriented forestry practices targeting the local ethnic inhabitants – is certainly a worthwhile and significant exercise.

This important and timely book examines the comparative performance of Participatory Forestry interventions by a number of government and non-government organisations in CHT involving selected communities. The language and style of presentation are lucid, and oriented not only to specialists but also to non-specialised readers. In addition to a comprehensive assessment of the major Participatory Forestry practices amongst selected ethnic communities of CHT, with a special focus on poverty reduction and public participation, this book also contains an insightful agenda of possible interventions towards improvement of people-centred forestry in CHT.

It is my pleasure to write this foreword, and I expect a wide readership for this volume.

Studies on Participatory Forestry in general, and in the context of Chittagong Hill Tracts in particular are still quite limited in Bangladesh. This volume thus attempts to fill in a long-felt vacuum in the concerned literature. I congratulate the authors for taking up this useful initiative. I strongly feel that this work will make a substantial contribution to the cause of highlighting community-led forest management in the country.

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Table of Contents

Acknowledgments	vii
Forward	ix
Abbreviations	xvii
Chapter 1	19
Introduction	19
The Background to PFM in Bangladesh	20
PF for Poverty Reduction and Participation	22
The CHT People and their Livelihood	24
Research Problem	25
Research Objectives	28
Structure of the book	28
Limitations of the Study	31
Chapter 2	33
Forests and People in Bangladesh Forest Management	33
Introduction	33
An Overview of Forests in Bangladesh with Special Reference to CHT	34
The history of forest management in the CHT region	35
Pre-colonial Era: Pre-Mughal Era	36
Pre-colonial Era: Mughal Era	40
Colonial Era: East India Company	41
Colonial Era: British Government	46
Post-colonial Era: Pre-independence (Pakistan Era)	56
Post-colonial Era: Post-independence (Bangladesh Era)	59
Forest policies in Bangladesh: A historical synthesis	61
British Colonial Policy	62
Forest Policy, 1894	63
Forest Policy, 1955	64
Forest Policy, 1962	65
National Forest Policy, 1979	67
National Forest Policy, 1994	68
Forest acts, rules and regulations	70
The major forest types	71
Hill Forests	72
In-land Sal Forests	72
Tidal Mangrove Forests	72
Forest Cover and Status	73
The CHT People	75
Ethnic communities	76
Ethnic origin	76
Group identification features	77

The CHT case in particular	79
Population	79
Religions of the CHT people	81
Ethnicity, Cultivation and Economy	82
Traditional Agricultural Practices: Jhuming	84
Languages	87
Conclusions	87
Chapter 3	91
The Currency of Participatory Forestry	91
Introduction	91
Concepts and Nature of PF	92
Land and Tree Tenure	96
The Role of Forestry Organizations and Policy	98
The Role of Local Organizations	99
Social Relations and Power Structure	101
Market Opportunities	103
Role of Donor Agencies	104
Global Focus	105
Regional Factors	107
Bangladesh Perspectives	108
PF activities in Bangladesh	110
Betagi-Pomora Community Forestry Project	110
Forest Extension Service Scheme	111
Community Forestry Project	111
Upazila Afforestation and Nursery Development Project	112
Forestry Master Plan	113
Forest Resource Management Project	114
Coastal Greenbelt Project (1995-2002)	114
Forestry Sector Project (1998-2004)	114
NGO Interventions in Social Forestry	115
Studies on People's Participation in Bangladesh	117
Selected major PF programmes in CHT	123
Farming System Research and Development (FSRD) Programme	123
Integrated Afforestation and Jhumia Rehabilitation in the Unclassified State Forests of CHT	125
Afforestation and Settlement in the Unclassed State Forests of CHT (2nd Phase)	129
Afforestation and Rehabilitation of Jhumia Families in the USF and Reserved Forest Land of CHT (3rd Phase)	132
Forestry Sector Project	135
Upland Settlement Project (Phase 1)	137
Upland Settlement Project (Phase 2)	140
Village Common Forest (VCF) Project	141
Horticulture Development Project	143
Sustainable Hill Cultivation Programme	146
Conclusion	148

Chapter 4	151
The Research Design and Methodology	151
Introduction	151
Framework of the Study	152
Methodological Aspects	155
Study Phases	156
Phase I	157
Study Projects, Locations and Villages	157
Phase II	165
Techniques and Tools of Data Collection	166
Phase III	175
Strategies for Data Processing and Analysis	175
Chapter 5	177
Empirical Analyses, Observations and Discussion	177
Introduction	177
General Issues	177
Participants' gender, ethnicity and religion	178
Participant age, family size and education	180
Land tenure status	183
Land use	184
Discussion of general issues	187
Income Generation	188
Income of the participants	188
Income Variations among Organizations	192
Relationship Characteristics among the Organizations	193
Level of Farm Income	196
Farm income components	197
Organization-wise Variations in Farm Income Components	198
Farm Income Component Levels	199
Relationships among the Farm Income Components	201
Forestry income	203
Organization-wise Variation in Forest Income Components	204
Forest Income Component Levels	205
Relationships between Forest Income Components	207
Participants' comments regarding economic upliftment	209
Discussions about income generation	210
Expenditure Patterns	212
Expenditure patterns of the participants	212
Organization-wise Variations in Expenditure	213
Expenditure Component Levels	215
Relationships among the Income and Expenditure Components	215
Farm expenditure components	215
Organization-wise Variation among the Farm	
Expenditure Components	223

Farm Expenditure Component Levels	224
Relationships among Farm Expenditure Components	227
Forestry expenditure components	229
Organization-wise Variations among Forestry Expenditure Components	230
Forestry Expenditure Component Levels	231
Relationships among Forestry Expenditure Components	232
Social expenditure	235
Organization-wise Variation among Social Expenditure Components	235
Relationships among Social Expenditure Components	236
Discussion about expenditure patterns	239
Participation	244
Opportunity indicators	244
Decentralization	244
Linkages	245
Flexibility	246
Incentives	246
Prevalence indicators	247
Decision Making and Implementation	247
Monitoring and Evaluation	249
Benefit Sharing	250
PF Achievements	251
Economic welfare	251
Income, Employment and Associated Opportunities	251
Environmental Sustainability	252
Social development	255
Human Capital Development	255
Social Capital and Inclusion	256
Good governance	358
Participation and Involvement	258
Observance of Contracts and Agreements	259
Administration, Technical Design, Extension Services & Bureaucracy	260
Election of Leadership	261
Chapter 6	263
Summary, Implications, and Clues on Improvement	263
Introduction	263
General and Crosscutting Issues	264
Gender Balance in Participant Selection	264
Community Consideration in Participant Selection	265
Religious Harmony	266
Participant Age Criteria	267
Family Size	267

Expanding PF Practices in High Hills	268
Land Tenure	268
GO and NGO Linkages	270
Inter-sectoral Coordination	270
Economic Upliftment	271
Income of the Respondents	271
Land and Farming Intensity	271
Farming Income	273
Forestry Income	273
Income from Bamboo	274
Agriculture and Livestock Income	275
Farming Components	275
Off-farm Income	275
Expenditures of the Respondents	276
Farm Expenditure	277
Forestry Expenditure	278
Social Expenditure	279
Participation	280
Decentralization	281
Linkages	281
Flexibility	281
Incentives	281
Decision Making	281
Monitoring and Evaluation	282
Benefit Sharing	282
PF Achievements	282
Economic Welfare	283
Social Upliftment	284
Good Governance	284
Summary and Conclusions	285
Major Observations and Findings	287
Key Recommendations	292
Chapter 7	299
Recapitulation and Epilogue	299
Bibliography	305
Index	331

Abbreviations

ADAB	Association of Development Agencies in Bangladesh
ADB	Asian Development Bank
BBS	Bangladesh Bureau of Statistics
BDR	Bengal District Records
BP	Before Present
BRAC	Bangladesh Rural Advancement Committee
BWDB	Bangladesh Water Development Board
CF	Community Forestry
CHT	Chittagong Hill Tracts
CHARM	Chittagong Hill Tracts Improved Natural Resources Management
CHIAT	Contour Hedgerow Intercropping Agroforestry Technology
CHTDB	Chittagong Hill Tracts Development Board
CTL	Contour Tress Line
DAE	Department of Agriculture
DLS	Department of Livestock
DOF	Department of Fisheries
DSA	Differentiated Slope Agro-forestry Method
FAO	Food and Agricultural Organization of the United Nations
FD	Forest Department
FMP	Forestry Master Plan
FRI	Forest Research Institute
FSRD	Farming System Research and Development
GO	Government Organization
GOB	Government of Bangladesh
GOEP	Government of East Pakistan
HKH	Hindu Kush Himalaya
ICIMOD	International Centre for Integrated Mountain Development
IUCN	International Union of Conservation of Nature
NGO	Non-Government Organization
NVS	Natural Vegetative Strip Method
ODA	Overseas Development Agency
PF	Participatory Forestry
PFD	Participatory Forestry Development
PFM	Participatory Forest Management
PLA	Participatory Learning and Action
PRA	Participatory Rural Appraisal
RDRS	Rangpur Dinajpur Rural Services
RF	Reserve Forest
RRA	Rapid Rural Appraisal
SALT	Sloping Agriculture/Agroforestry Land Technology
SF	Social Forestry
SNDP	Sustainable Development Network Programme
SWG	Site Working Group
TFF	Tree Farming Fund
UNDP	United Nation Development Programme
UNICEF	United Nations International Children's Emergency Fund
US	United States
USAID	United States Agency for International Development
USF	Unclassified State Forest
VCF	Village Common Forest
WB	World Bank
WFP	World Food Programme
WOCAT	World Overview of Conservation Approaches and Technologies
WRI	World Resources Institute

Chapter 1

Introduction

The focus of this study is Participatory Forestry (PF) in the Chittagong Hill Tracts (CHT) region of Bangladesh. Similar to other South Asian countries, the Bangladeshi forests have been subject to immense degradation due to regressive forest management measures. PF emerged in Bangladesh as a general and essential consequence of remedial attempts to halt forest degradation and restore degraded forest lands in the country. Such attempts were mainly goal-oriented programmatic activities with strategic implementation of forestry development and poverty reduction goals through effective people's participation. This practice was employed both in the plain lands and hilly region of the country, depending on location-based systems and surrounding contexts. CHT is the home to the majority of ethnic communities in Bangladesh, who each have specific cultures, livelihood strategies and relationships with nature. The Chakma, Marma and Tripura communities are the main forest dwellers practicing PF in CHT.

Ethnic communities in Bangladesh in general, and within CHT in particular, have a long heritage and tradition in resource management. CHT is a distinctive mountainous region in a predominantly flat land, occupying nearly 10 percent of the total land area, yet 76 percent of the hilly area, in the country. The region is inhabited by 12 ethnic communities with marked cultural diversity based on ecological influences including distinct hilly characteristics. For more than a century, the government has played an active role in the management of the natural resources in CHT. This is especially true in the case of managing the vast forest resources, which are presently in a degraded state. In the recent past, to simultaneously improve conservation and the development of forest resources, people's participation and the recognition of indigenous knowledge have been adopted by the government in principle as well as a means to policy execution. Thereby, PF have become important tools for re-forestation of this large tract of degraded land. Until recently, conflict and the political situation made access to CHT difficult, and therefore academic research in the said context has been negligible. However, a peace accord between the government and ethnic insurgents has recently been signed, which has opened new avenues and opportunities for

practicing community based forest management as a means to rural development and improving local livelihoods.

In the above context, to achieve viable success in PF, an approach which is not only founded on a sound scientific and technological basis, but is also anchored in the local, context specific social and cultural features of the ethnic communities, is necessary. Through its exploration of the problems and prospects of promoting PF in CHT, this study will ultimately be a helpful tool in identifying a viable path to PF intervention in the upland areas of Bangladesh and beyond.

With this end in view, this chapter introduces the background scenario to Participatory Forest Management (PFM) in Bangladesh, the relevance of PF to poverty reduction and participation, the CHT people and their livelihoods, the research problem and rationale, the research objectives, the structure of the book and the limitations of the study.

The Background to PFM in Bangladesh

The Bangladesh forests are located in tropical ecological domains of two forest zones; tropical rain forests and tropical moist deciduous forests. The two common forest types, Hill Forest and Mangrove Forest, cover more than two-thirds of Bangladesh's total forest area (FAO, 2007: 39). Hill Forest mainly falls in the tropical rain forest zone. The majority of the Hill Forest area of the country is situated in CHT, the region under study, which is also the home to a range of ethnic communities. Forests can provide both direct and indirect livelihood benefits including products, services and capabilities (Thomas, 2008: 1453; cited in Nath, 2009). Whether these benefits can be obtained sustainably without harming the recuperative capability of forest is an essential determinant in forest use. For this, sound forest management and forest use practices should be developed and put into practice. This requires managing forests in association with communities that depend upon forests for their livelihood, in an appropriate way balancing the sustainability of forest production and use. Until the pre-colonial administrative period (prior to approximately 1500AD), forests of this sub-continent, including CHT, were managed by forest dwelling communities with little or negligible interference from the rulers, thus a harmonious relationship between forest and forest people was maintained. Forest dwellers' resource extraction from their habitat is an important source of income, without which their ability to satisfy their basic needs would be jeopardised (Lopez-Feldman, et al., 2007), which informed a suitable forest management practice in highly visible existence at that time. As

elaborated in Chapter 2, CHT ethnic communities' traditional practices were not harmful to forest regeneration, due to the long fallow period which allowed for forest restoration as well as the existence of vast natural resources in comparison to the inhabitants' needs.

The colonial period emerged with British rule in the Indian subcontinent from 1757. Forest management during this period was characterised by a process of progressive commercialisation of forest use, the appropriation of forest land and revenue maximisation by the state and the predominance of commercial-industrial interests in forestry (Khan, 1998a: 4). These commercially-orientated activities led the forests to successive regressive stages of forest cover. The continuous implementation of exploitative measures for economic gain placed the country's luxuriant woody vegetation on a path of destruction. For the colonial foresters, extracting timber as fast as possible was the single goal of forest management, and the interdependence between forest and local people was largely ignored (Van Gelder and O' Keefe, 1995: 8). The most significant social impacts of these trends in commercialisation is the consequent change from community use of forests to state control, and the progressive diminution of forest communities' traditional rights (Khan, 1998a: 4). Bangladesh's forests have experienced deforestation and degradation ever since the British colonial period, the effects of which continued into the Pakistan era and were inherited by the independent Bangladesh. In many South and Southeast Asian countries, the lingering command and control approach to forest management is an upshot of colonial rule which managed forests from a commercial viewpoint ignoring the needs of the local communities (Nath, 2009: 10). Bangladesh was no exception, and the progressive stages of degradation Bangladeshi forests entered gave birth to many negative social factors which led to further forest degradation. Conflict grew between the government and local communities which contributed to the involvement of local people in the destruction of the forests. Thus, the policies and management measures taken in colonial India by the British rulers, as well as the local peoples' hostility to such treatment of forests, gave momentum to forest degradation that continued into the Pakistan period and even in the early stages of independent Bangladesh. The colonial legacy of forest policies and management lingered even after independence with consequential loss of overall forest cover (Ballone and Inoue, 2007: 414).

At present, Bangladesh's forests are deteriorating at an alarming rate due to various socio-economic threats, biotic pressure and

competing land uses (Muhammad, et al., 2008). The ever-increasing population of Bangladesh is exerting continuous pressure on existing forests for food, fuel wood, timber, fodder and other forest products and is resulting in the over-exploitation of government managed forest resources (Khan, et al., 2004:25). The increasing population necessitates greater food production and more forest products; therefore, an increase in forest area to meet the increasing demands for forest produce is essential. This, however, is almost impossible through traditional forestry practices, as forests are not safe unless the basic needs of man for food, fuel and shelter are satisfied (Chowdhury, 1986: 2).

The major weakness of forest management in Bangladesh has been the inability to secure the participation of villagers and the community at large, which has led to large scale encroachment and pilferage, which can only be stopped through effective public participation (FMP, 1992: 50). This major weakness is more visible in CHT, where 45 percent of the total forest land of the country exists. Due to the relentless exploitation by the colonial government, and current discriminate illegal logging and deforestation, the original forests have lost their immaculateness (Nath, 2009: 14). The diverse communities of CHT, who have practiced shifting swidden cultivation (*jhuming*) for centuries, are experiencing less productive *jhuming* due to the lack of sufficient lands to support the increasing population, therefore leading to a decreased fallow period. This has resulted unsustainable, repeated *jhuming* on the same land, thereby causing increased soil erosion, decreased water holding capacity and productivity, etc. Consequently, farmers involved in shifting cultivation have experienced food shortages and hence adopted non-farm activities including wage labour and illegal extraction and sale of forest produce to sustain their livelihoods (Nath, et al., 2005b). The above situation paved the way for PF intervention in Bangladesh.

PF for Poverty Reduction and Participation

PF originated as global concept, and has since been anchored as a progressive approach to forest management in South Asia. Since 1970, a major shift in Asian forestry development and management occurred, with the introduction of 'participatory approaches' to forest use and management (Khan, 1994). It was realised that the policing role played by the state was neither appropriate nor adequate to combat deforestation, launching a revolution in forest policy to incorporate PF methods. PF was adopted and practiced in different regions of Bangladesh in varied dimensions and manifest forms, decelerating and

halting the rate of forest resource depletion through the involvement of local people and the sharing of responsibilities of forest resource creation, protection, management and development.

Though initiated by government agencies, non-government PF initiatives were also subsequently encouraged. Programmatic interventions, based on locality and environment, were launched in Bangladesh and neighbouring countries India, Nepal and Bhutan. In an attempt to provide a broad conceptual idea in this context, PF approaches, strategies, programmes and activities in those countries, along with their participatory goals and achievements have been elaborated in Chapter 3. In the Bangladesh context, government and non-government programmatic initiatives were put under review, with focus on specific project interventions in CHT.

PF, under the name Social forestry (SF), has been a widely accepted and promoted solution for deforestation and alienation of forest dwellers. There has been unprecedented enthusiasm for SF in Bangladesh in line with other South Asian states (Khan, 1998a: 6). Since the early 1980s, forestry in Bangladesh has witnessed a rapid succession of PF programmes in an attempt to redress public alienation and to allow for wider participation of people in forest use and management (Millat-e-Mustafa, 2002). This included afforestation in marginal and degraded forest lands, strip plantations along highway and collecting roads and embankments, block plantations in state lands throughout the country, and expansion and extension of forestry for local community development with benefit sharing mechanisms, greatly emphasised in CHT.

The goals of PF encompass numerous economic, social and environmental factors. The national Bangladesh Forest Policy (1994), which was formulated in response to the vision and recommendations of the Forestry Sector Master Plan of 1992, identifies preconditions of meeting basic human needs, continued socio-economic growth, participation in decision making and benefit sharing, sustained political commitment, and sustainable utilisation of forest resources for the development of the Bangladesh forestry sector. This policy provided an avenue for taking up forestry development programmes to meet the basic livelihood needs of present and future generations by creating employment opportunities through extending and consolidating forest-based rural development. This also strengthened the scope for local people's participation in preventing illegal occupation of forest lands, illegal tree felling, etc. Along with poverty alleviating social and economic goals, the environmental goals of bringing denuded forest

lands under green cover, control of soil erosion, and increase of the water holding capabilities of soil and watersheds as well as soil productivity emerged as an updated vision of PF development.

Poverty reduction is the stated ‘overarching thrust’ of the Bangladesh government’s development policy and practice. Development programmes in the public sector are committed to contribute to poverty reduction through the promotion of pro-poor economic growth, social development and good governance (Khan, et al., 2004: 14). PF activities in Bangladesh are oriented towards strategically managing and developing project initiatives for such poverty reduction through effective people’s participation. The GO and NGO PF interventions reviewed in Chapter 3 particularly point to the desired programmes in light of socio-economic and participatory achievements along with environmental gain through physical project achievements.

The expansion and extension of forestry for local community development is the development aim for PF intervention in CHT. The strategy is to convert nomadic shifting cultivators into settled farmers. The main problems of this region are socio-economic and can be listed as acute poverty, superstitious beliefs and practices, and poor health, sanitation and nutrition (Ghafur et al., 1987). From 1957 to 1983, the Bangladesh government undertook several *jhumia* settlement programmes which did not include the participatory approach or concept. Most of these programmes failed to achieve their stated goals and expectations (Nath, 2009:16). Based on the experiences gained from such initiatives, FD, CHTDB and some NGOs have launched PF programmes mainly anchored in settled farming practices, with individual projects having their own technological and management approaches. Their PF goals and strategies are in line with government policies and stated goals of poverty reduction through people’s participation. Economic welfare, social upliftment and good governance were the collective desire and evaluation measure in PF programme performance, along with participation achievements. In line with the above facts, PF project interventions of GO and NGO PF agencies have been reviewed in Chapter 3 to provide a conceptual idea as to the project activities for conceiving of the research problems, logical framework and methodological considerations of this research study that are elaborated in Chapter 4.

The CHT People and their Livelihood

CHT is the home of many ethnic communities living in a uniquely mountainous area of Bangladesh. Most members of these ethnic

communities are distinctly different from the people in the plain land areas of the country. Thus, the term “ethnic communities” refers to those people whose linguistic and/or cultural background is different from the linguistic and cultural background of the mainstream population of Bangladesh (Khaleque, 1998). They are also known as tribes or, in Bengali, *adivasi*. Out of the total 17 ethnic communities in Bangladesh, 12 are found in CHT. Amongst them, mainly the low hill dwellers are found participating in PF programmes. The three principal communities are Chakma, Marma and Tripura. Chakma and Marma fall in the category of “children of the river” (Khyoungtha), and the Tripura “children of the hills” (Toungtha). Though individual communities have specific cultures, livelihood strategies and relationships with nature, they live in harmony with each other. In order to involve them in effective PF practices, their relationships with nature and culture-based human dimensions have been elaborated in Chapter 2, to provide an in-depth idea about the related behavioural and livelihood patterns of these PF stakeholder communities.

The Research Problem

Enquiring about appropriate resource management strategies and implementation measures requires substantive background studies. A thorough background about research sites will communicate to the reader the purpose and setting of a case study (Yin 2003). The above background set the stages of my research study which explored forest land-based resource management in Bangladesh and the emergence and progress of PF, based on local systems and surrounding progressive and regressive factors, including people’s land-based livelihood and environmental dimensions.

Studies that have been done on Bangladesh PF are mainly based on general economic and silvicultural dimensions. These are also mostly founded on insufficient data and are of observatory and review type. Moreover, social studies are very limited and weak in empirical context. Information on the Bangladesh forestry sector, especially in regard to sociological dynamics such as poverty reduction and public participation, has been scarce and difficult to access (Khan et al., 2004:3). Such studies in CHT are also very limited.

A number of studies conducted on PF activities in Bangladesh have been outlined in Chapter 3. These all target one particular project or the activities of one particular PF agency. Comparative studies of PF agency performances were almost completely absent. This is particularly true for the PF research studies done in CHT. These

particular project- or agency-based studies showed that projects' physical targets were mostly achieved, but the achievement of participatory goals was partial or insignificant. The basis of these studies was mostly qualitative and founded on insufficient data to be called in-depth or intensive studies, and comments were mostly generalised.

Drawing on the reference of Zashimuddin (2004), it is cited in Nath and Inoue (2008a), that PF in Bangladesh has generated sufficient resources and income to raise the rural poor above subsistence level. Asian Development Bank reports (ADB, 2005; 2007) state that project beneficiaries seem to have increased their average annual savings, accumulated assets and improved their social status as result of their participation in forestry projects. However, these ADB reports did not provide the data required to understand the impact of these projects (Nath, 2008a). Therefore, in-depth study on the economic and social upliftment of the PF participants is necessary to gain a firm understanding of the impacts and implications of PF interventions. Moreover, previous studies conducted did not adequately examine the different technological and management practices, income and expenditure level based component performances of the participants and activity-based social upliftment, etc. A component-wise income level-based comparative study will be able to effectively guide policy-makers and planners to direct future PF activities in the proper direction. This research study responds to such scarcity of comparative in-depth and component-wise empirical investigation based on both technically and socially sound footing.

Again, the contribution of the forestry sector to the government development goals of poverty reduction and people's participation still remains relatively underexplored (Khan, et al., 2004: 1). Though some such contributions have been documented in different project reports and papers of the Bangladesh Forest Department, these are purely theoretical overviews, manifesto-type statements and notes. Moreover, these documents mainly relate to project activities in the plain land areas of Bangladesh. Again, documentation about PF project activities in CHT is scarce. Therefore, there is a need to explore the contribution of CHT PF projects in achieving poverty reduction and people's participation that is anchored in firm scientific methods.

In general, there has been very limited research on PF involving ethnic communities in Bangladesh. This study, therefore, may contribute to filling the vacuum in the concerned literature. PF is the dominant public forestry and rural development strategy in the country.

Any study which focuses on exploring ways of continuing and improving project performance and efficacy and also to sustain the development of PF is therefore significant.

The history of management and use of CHT forests is similar to that of other forests in the Indian sub-continent, as CHT forests were also managed by the concept of progressive commercialisation resulting in the consequent alienation of local communities. This provides the context for a meaningful analysis of current SF programmes (Khan, 1998a: 9), as PF in CHT is a consequence of this wider historical management process. Therefore, any study focusing on the performance of PF with the goal of redressing the alienating impacts of forest management through poverty reduction and people's participation is extremely relevant. This study attempts to explore such goal-oriented achievements of PF practices in CHT and their impacts and implications.

Sustained community participation in development interventions helps in maintaining natural resources and the flow of accrued benefits over time (Sinha and Suar 2005: 126). With effective participation, the success and failure of a projects in any particular community would be in the hands of the people of that community and, for the projects to be sustainable, all community members must be involved, or at least considered, in the decision making process, and must be able to share in the benefits (Ikerd, 2001). Community participation is a difficult task in any society, perhaps more so in a developing country like Bangladesh (Khan, et al., 2004: 4). Wealth and power inequalities cause problems of conflict of interest. Empowerment of communities to develop a feeling of ownership to undertake activities to protect and develop resources that benefit community members commonly is a necessity for effective participation. Access to information for making informed choices, the ability to participate in the management and operational tasks starting from planning to implementation and evaluation, transparency and accountability are preconditions for such participation. This is more difficult in CHT, where people of diverse communities live and their traditional livelihood is based on nomadic shifting cultivation. Therefore, in the overall context of CHT, any study on PF practices is obviously significant.

The region of CHT is of strategic geographical and social importance because of its unique location, topography, land tenure systems, ethnic diversity and forest and natural resource base. CHT covers nearly 13,000 square kilometres of land in the south-east region of Bangladesh, nearly 80 percent of which is occupied by hill forests.

Unfortunately, this vast tract of land, particularly the Unclassified State Forest (USF), is now almost treeless. The 0.50 million ethnic people who live in CHT are virtually all forest dwellers. The denudation of forests has not only degraded the ecosystem of this region, but at the same time has threatened the subsistence of the people. Hence, for the reconstruction of the ecosystem and to ensure the subsistence of the 0.50 million forest dwelling ethnic people, re-forestation of this vast tract of forest land is urgently needed. The government of Bangladesh, along with many other donor agencies, has already shown interest in participatory re-forestation programmes. Legislation for benefit sharing mechanisms has already been enacted. In this context, this study may provide valuable information and lessons towards the process of development of CHT regarding the livelihood of ethnic communities and the protection of forest resources.

Research Objectives

Based on the above rationale, this research study will proceed with the following objectives:

1. To assess the status of PF among selected ethnic communities in CHT.
2. To examine the current performances and future prospects of selected GO and NGO PF practices.
3. To elicit and make functional and policy recommendations in order to make PF more effective in CHT.

Structure of the Book

This volume comprises seven chapters including this chapter. A brief description of each chapter follow:

Chapter 1

This chapter provides a general introduction to the study, focusing on the background scenarios that set the stages of this research, outlining the research problems, objectives, and a summary of the structure of the book

Chapter 2

Chapter 2 reviews the salient features of the forests focusing on a forest management and policy-based historical synthesis, the emergence of PF, and people in CHT. Local people's rights and privileges in forests in the pre-colonial and pre-commercial eras, the advent and proliferation of commercialisation, and the post-independence period are reviewed, along with their impacts on and

implications for forests and forest dwelling people. The alienating commercialisation-guided activities that increased degradation of the forests, and the adoption of people's participation in forest management to redress the destructive trend towards progressive forestry development, are outlined in this Chapter in an attempt to provide a well conceived background to set the scene for this study.

Chapter 3

Outlining the nature and concept of PF and related influencing factors, this Chapter reviews PF as the current dominant forestry practices from Bangladesh country perspectives. It examines the PF achievements in line with physical and participatory achievements focusing on socio-economic issues and poverty reduction. This chapter surveys research studies on PF practices in Bangladesh. Furthermore, analysis of some selected GO and NGO PF projects' technological and management practices with specifically set achievable participatory goals is incorporated in this review chapter in order to provide a conceptual idea for identifying research problems and setting objectives of this study. This analysis was also helpful in formulating the logical framework and methodological considerations of the study.

Chapter 4

This Chapter covers the materials and method of the study. The study framework has been formulated together with the detailed methodological considerations that incorporate three study phases. In Phase I, the criteria and the selection of study projects, locations and villages and a brief required description of the selected study villages are completed. In Phase II, questionnaires are prepared and the selection of participants for interviews and the various techniques and tools for data collection are selected. In Phase III, the methods of compilation of data and the strategies of data processing and analysis are decided.

Chapter 5

Chapter 5 presents empirical findings and inferences through intensive field studies based on the study framework and the concerned methodology. The analysis and discussions of the field studies are presented under the headings General Issues, Income Generation, Expenditure Patterns, Participation, and PF Achievements, as briefly outlined below.

General Issues presents observations of GO and NGO PF practices in CHT as well as gender, ethnicity, religion and age, family size,

educational scenarios, including organization-wise pictures of these socio-demographic characteristics.

Income Generation includes comparative income gains due to involvement in PF practices, including organization-wise relative income gain, showing variations among the income components of Farm Income, Off-farm Income and Income before Project, relevant correlations and levels of farm income. In an attempt to achieve an in-depth understanding of PF income, it is broken down into Forestry, Agriculture and Livestock components, and the organization-wise variations, levels and relationships between these farm incomes components assessed. Additionally, the income from Forestry, being the non-negotiable determinant in PF practices, was further broken down into its components Tree, Fruit and Bamboo. An attempt was made to focus on organization-wise variations, relevant correlations and levels of these components of forestry income in order to find out the related factors and variables that influence income generation.

Similarly, Expenditure Patterns includes Farm Expenditure and its component-wise organizational variations, relevant correlations and the levels of expenditures. It was attempted to assess the Farm and Forestry Expenditure components of Farm Expenditure, focusing on organization-wise variations, relevant correlations and levels, in order to provide an in-depth understanding of the componential preferences of the participants and the related factors and variables. Social Expenditure, along with its components, was assessed in terms of organizational variations and componential relationships in an attempt to identify social upliftment of the participants and related component-wise issues.

Participation includes an assessment of the nature and extent of participation as observed, analysed and evaluated. An attempt was made to assess participation between the participants and the participating organizations as well as variations in such participation among the organizations, based on opportunity and prevalence indicators of participation. These indicators include: Decentralization, Linkages, Flexibility, Incentives, Decision Making and Implementation, Monitoring and Evaluation and Benefit Sharing.

PF achievements were studied, analysed and evaluated by using the determining indicators of Economic Welfare, Social Development and Good Governance as the key criteria for assessing performances in achieving economic and social welfare through poverty reduction and participation. As such, it was attempted to assess achievements in Income, Employment and Associated Opportunities, Environmental Sustainability, Human Capital Development, Social Capital Inclusion, Participation and Involvement, Contracts and Agreements, Administra-

tion, Technical Design, Extension Services and Bureaucracy, and Election of Leadership.

Chapter 6

This chapter deals with the functional and policy-level implications of the empirical findings as stated in Chapter 5. Accordingly, it summarises major observations and findings of the study together with the recommendations made for future land based resource management through PF practices in CHT.

Chapter 7

The main arguments of the book are recapitulated in this chapter, which ends with a call for further research on the subject.

Limitations of the Study

PF has many components, faces and ramifications. PF performances can be explored from various technical, economic, social, environmental and other related human dimensional aspects. It is impossible for any one study to grapple with all dimensions of PF. This research endeavours to provide a reasonably in-depth understanding of selected salient issues which are directly relevant to poverty reduction and participation, and which have remained relatively underexplored and poorly researched in the context of CHT. Hence, this study cannot claim to be representative of all the issues and dimensions of PF practices in CHT.

The study attempts to cover all the three districts of CHT. However, it was found that in many project interventions, activities were confined to specific districts and locations. Thus, an aggregated performance study of selected PF agency project interventions in different phases of implementation was undertaken in order to cover the whole CHT region. Again, similar NGO interventions were also not found to be conducted in all the three districts by a particular NGO. This limitation necessitated the study to carry out an aggregated analysis of all PF projects of particular government (GO) agencies as well as the three selected NGOs in the three CHT districts, in an attempt to perform a goal-oriented, macro-level study of the whole CHT region.

This study mainly focused on the farmers residing in PF villages who are continuing PF practices. It did not cover the overall organization-wise attempts to settle the *jhumias* and involve them in PF farming practices and evaluate the successes and failures thereof. Nor did it not cover the issues related to land conflicts, socio-political

situations, insurgencies, ethnic leadership, etc. Regarding the ethnic communities, the study selected only the Chakma, Marma and Tripura communities. Barring the Tripura community, the other Toungha (children of the hills) communities, such as the Bawn, Murong, etc, who are also practicing PF in CHT, were not included in this study. Hence, this study cannot claim to be a general PF study of ethnic communities in CHT.

In this study, following the suggestion from some studies that a typical single case study of a commonplace situation is representative of an average situation, one PF village from each project was selected, based on overall similarity in technological and management practices. Alternatively, a particular village selected for case study may not represent the holistic situation of the project and therefore, the outcome of the project as well as the organization may not be the same. Hence, a study comprising more project villages may be more useful.

Chapter 2

Forests and People in Bangladesh Forest Management

Introduction

Bangladesh's forests have been gradually degraded over a long period through a number of damaging activities, including commercial logging, illicit felling of trees, the conversion of land to agriculture and other non-forest uses, fires and grazing. The main underlying cause was the commercial use of forests by colonial rulers that not only degraded forests but also alienated local people and compromised their rights and privileges in relation to forests. The policies and management measures adopted by the colonial rulers from time to time were cause for heightened enmity of people living in and around the forests, thereby triggering forest destruction through illicit felling. Additionally, rapid population growth in Bangladesh has increased the demand for forest produce that added momentum to this illicit destruction of forests. Such an alarming rate of deforestation caused increased soil erosion and decreased the land's water holding capacity, resulting in loss of habitats and biodiversity, thus accelerating the degradation of forests as well as the overall environment.

In CHT, the abovementioned factors contributing to forest degradation are highly visible. Along with those factors, continuous expansion of shifting cultivation in the limited natural forests on hilly land exacerbated the situation in the hill tracts. The level of forest degradation in CHT, combined with the associated problems, limitations and challenges in resource management, spurred a shift from traditional forest management strategies towards participatory approaches. PF has become accepted as an appropriate strategy to manage and develop resources through the encouragement of effective participation of local people in forest resource management and development in both plain land and hilly areas of the country, including our study area of CHT.

Designing and implementing successive, progressive, people-oriented forestry practices requires the understanding of the historical aspects of forest management and policy, as well as their positive and negative features and how they impacted on forests and forest-

dependent people. Appropriate knowledge of the nature of community tradition, culture and livelihood of the communities involved in such practices should guide implementation strategies. This chapter provides a historical overview of forest management and policies with special reference to CHT and the forest-dwelling communities.

An Overview of Forests in Bangladesh with Special Reference to CHT

The evolution of natural forests has been brought into being through repeated invasion and succession (Troupe, 1921). Like other naturally established forests of different geographical regions in the world, the forests of Bangladesh have also evolved through repeated invasion and succession. Forests passed the initial and transitional stages of progressive successions and thereby occupied the climax stage long before the inception of forest management in this sub-continent; therefore, no documentation about the duration of existence of climax vegetation is available. However, studies and inventories provide evidence that there was once luxuriant woody climax vegetation in our forests. The hill forests, plain land *sal* forests and mangrove forests of Bangladesh once possessed luxuriant woody climax vegetation that was the outcome of repeated invasion and progressive succession. Hence, the closed, multi-storied high hill forests of CHT also reached the climax stage due to natural progressive successions. These highly developed formations were established as the influences of negative factors were not so prominent and were overcome by positive successive factors.

However, in the course of time, regressive succession gradually engulfed CHT vegetation, which ultimately morphed into a simpler type. According to Troupe (1921), the reverse of progressive succession after climax formation is called regressive succession. The reverse process in which a more highly developed formation, which may be hygrophilous or mesophilous in type, reverts to a simpler or more xerophilous type, is known as “regressive succession”; it is exemplified by the gradual deterioration of forests through fire, grazing or otherwise. Therefore, forests in CHT may be regarded as in the stage of regressive succession. Forest degradation and the associated regressive, successive factors gradually caught the attention of the then pre-colonial rulers and forest management concepts and strategies were incepted. Attempts were made to grow and manage forests in the name of developing forests, but during different ruling periods both progressive and regressive succession were witnessed. Such attempts at

managing forests for redevelopment into climax vegetation by ancient rulers of this region were not long lasting due to the numerous forest degrading programmes executed by colonial rulers.

Bangladesh's forests, like other forests of the Indian sub-continent and elsewhere, reached the climax stage at a time long before documentation and management initiatives were taken into account. Even in the deepest areas of the reserve forests of CHT, during inventory surveys carried out in 1961-63 by Forestal Forestry and Engineering International Limited, Canada, no climax vegetation was found. Their inventory report stated that "the extensive practice of Shifting Agriculture and the associated fires prior to the reservation of forests have served to introduce further complexities in the character of vegetation. True virgin forest or climax forest is practically non-existent" (Forestal, 1964).

As far as the history of Forest Management is concerned, the literature dates back from the pre-Mughal period, and is then gradually enriched through the Mughal period, the British Indian period, and so on. However, the policy and management measures adopted from time to time provide a sharp indicator of the degradation of forests due to the negative impacts of regressive succession variables. In order to grasp the state of degradation of Bangladesh's forests, particularly the forest conditions in CHT, it is necessary to know the history of forest management, with special reference to the depletion of forests. This will in turn assist in identifying problems and devising measures for future forestry development by mitigating the negative impacts of regressive succession. The ultimate goal of this chapter is to understand how CHT forest, while in the negative succession stages, was reorientated towards people-oriented beneficiary forestry via participatory forest land use. In this context, the PF measures adopted so far are discussed in Chapter 3.

The history of forest management in the CHT region

According to the mythological Hindu text "Rigveda," the formation of villages (named *palli* in ancient times) in the Ganga valley was an ancient attempt at civilisation. The first settler in the Ganga valley was traced back to 4380±130 Before Present (BP) (Bose, 1916). At that time, the uncultivable land, i.e forest, was called *Aranaya*. Forest resources were very abundant then in respect to the population's basic needs, such as food, fuel, fodder, building material, medicine, etc, but their use was inherently regulated by religious and cultural norms. Although the documented historical evidence is scarce, these findings

were also established from the travel literature of ancient travellers Fa Hain, Houen Tsang and Ibn Batuta in the 5th, 7th, and 11th centuries, respectively. According to them, the natural beauty and rich resources of the then *Bengal* was in perfect harmony with the culture and tradition of the society. The discourse of Forest Management in Bangladesh can be considered under the following eras:

1. Pre-colonial Era: a. Pre-Mughal Era, b. Mughal Era;
2. Colonial Era: a. East India Company, b. British Government; and
3. Post-colonial Era: a. Pre- independence, b. Post-independence.

A thorough examination of these forest management eras was compiled by Khan (1998a), who wrote a historical synthesis of forest management and policy measures with evidence from archival records. Therefore, as a general consequence, in describing these management eras and their impacts on forests and forest-dwelling people and communities, Khan (1998a) is referred to repeatedly, with other literature to support and validate.

Pre-colonial Era: Pre-Mughal Era

Also known as the pre-commercial era, in this period the abundant forest resources were managed according to religious norms and traditions and in harmony with the needs of the communities living in and around the forests. Hindu religion considered the forest as a place of God. The story of Ram and Shita Devi was associated with forest. The romance of Hindu gods Krishna and Radha was ascribed with forest and has been named 'Sri Brindhaban'. This forest is still preserved in India as the sacred forest of romance. This type of forest 'God's Grove' was named as 'Devarannya' in Hindu and other mythological books (Dwivedi, 1980). In about 1500 B.C., various *Vedas* were written including stories describing the then common belief that *Rishis* (Saints) had knowledge of the poisonous and medicinal values of trees. *Rishis* also warned against deforestation and advocated against the cutting down of trees, believing that deforestation caused poor rainfall. The *Ramayana* and *Mohabharata* described forests in many ways; noteworthy among them is that of an afforested locality named Indraprastha. In the Vedic period, *Vishnu Purana* and other scriptures recognised nine important forest regions in India. *Puranas* (ancient stories) also say that trees help their ancestors to reach heaven. In addition, Buddhists were the conservators of shade trees, as the founder of the religion, Buddha, achieved his divine wisdom under a shade tree. However, historical evidence of forest management in the pre-colonial era, especially before the Mughal

period, was very scarce and complicated, and thus hard to generalise. According to Khan,

Documented historical evidence on pre-commercial forest use in south Asia is relatively scarce. The available literature vary in terms of quantity and quality of information. This variation, combined with the wide regional diversity of south Asia, make generalizations very difficult. However, a substantial literature argued that the forest based locals in different part of south Asia had a tradition of growing trees and managing their neighbouring forests without the stimulus of outside interventions (1998a: 23).

This statement signifies that a management system that was symbolic of local communities and forests, modified as required for different localities based on local culture, tradition and beliefs, was in active use in the pre-Mughal era. In this way, it is possible that during ancient times CHT forests were also managed by local ethnic communities according to their needs and beliefs, whilst maintaining a symbiotic relationship with nature. Elwin (1963: 51) and (Anderson and Huber, 1988: 36) (Cited in Khan, 1998a: 13), among others, argued that “to a vast number of local people the forest is their well loved home, their livelihood their... very existence.” In the pre-Mughal period, there was a close link between local communities and their neighbouring forest, people had sufficient access to forests to fulfil their subsistence requirements, and they practiced a localised, informal and culturally determined pattern of resource use which ensured a balance between local demand and sustainability of production (Khan 1998a: 24), also see Guha (1989), Anderson and Huber (1988), Fernandes, et. al. (1988), Kulkarni (1983), and Gadgil (1985; 1987; 1989).

There were primarily two systems of resource use in the pre-colonial Indian sub-continent: the Ethnic System and the Agrarian System (Gadgil, 1989; cited in Khan, 1998a: 25). In the Tribal System, more or less homogeneous ethnic groups controlled a certain land area as common property, with the pattern of resource use determined on a cultural basis. An agrarian village community practiced the Agrarian System, where there was community controlled supply of forest products and religiously-protected safety forests attached to each village. Fernandes, et al. (1988), Guha (1989), Gadgil (1989), Fernandes and Kulkarni (1983), and Haimendorf (1982), along with many others, argued that both systems have some notable characteristics in common: 1) restriction of resource flow within local territories, 2) fulfilment of local demands and subsistence of the

resource base was regulated by the community, and 3) conservation and propagation of the resources was the responsibility of the local people.

Whatever the system that was in practice, the common property resources were absolutely under community control. Citing Sharma (1965) & Arnold and Stewart (1989), Khan (1998a: 25) noted that “(t)hough there is a debate on the extent and nature of such common property (such as Forests) in pre-commercial time, major studies suggested that a significant land area, especially forests and watershed was most likely under community control in many region of south Asia.” Extensive study on early medieval Indian feudalism by Sharma (1965), presented historical evidence from ancient texts and scriptures that state in early medieval India (500-1200AD), pasture grounds, forests and water reservoirs could not be “partitioned,” and communities enjoyed “communal rights.” Arnold and Stewart (1989: i) argued that even until the early 19th century, up to two-thirds of land in India was under community control. Singh (1986: 2-10) noted that prior to the colonial forestry legislation of the 19th century, at least 80 percent of India’s natural resources were common property. Poffenberger (1990a) also offered evidence of traditional forest management via common property in some parts of Southeast Asia. The above studies suggest that the pre-Colonial local communities may not have owned forest land, but were considerably involved in their management, and had access to forests to meet their subsistence demands. This indicates that at that time, local communities’ involvement in forest management was considerable, and included user rights for meeting their subsistence needs, though they did not own forestland. Many other extensive studies also showed evidence of this type of traditional forest management based on common property in India and other parts of South Asia. (Singh, 1986; Poffenberger, 1990a).

Based on the above evidence, it may be suggested that in pre-colonial times in CHT, both the Tribal System and the Agrarian System were in practice. However, the landscape and topography indicate that the Tribal System was practiced predominantly throughout CHT in a local, community-based management system where people’s involvement was significant. In this way, traditional forestry practices in CHT evolved over generations, as a part of a survival system for the locals. According to Dalmacio (1989) and Abedin and Quddus (1991), indigenous forest management, mainly in the form of shifting cultivation practiced by hill communities for the

production of perennial trees and annual vegetable crops has been effectively practiced for centuries. As such, it may be opined that the localised, community-based Tribal System practiced in CHT was one of shifting cultivation which was effective in meeting local demands, adaptive to the local context and of reasonably long existence. The mentionable aspect is that it ensures, to some extent, local people's involvement in forest management and a share of forestry produce, i.e. participation. Community leaders, or headmen, tried to maintain a sustainable supply of forest resources for their own clan. In other words, sustainability concerns were included in the cultures and traditions of CHT communities, and forests were managed, to some extent, through community participation.

Community conservation and management of forests in CHT may be envisaged as similar to the findings of Guha (1989) in some of the Himalayan regions of India. According to him, those areas studied exhibited successful local forestry practice in collaboration with agriculture and animal husbandry. Village and cultivated sites were judiciously chosen to make best use of the neighbouring forests and other related resources (i.e. all crops were raised to perfection, but planning and assurance of optimal utilisation of forests according to the landscape and topography was predominantly based on socio-religiously determined patterns). Findings similar to those of Guha were stated by Bose (1916) and Haimendorf (1955; 1982). Within the limits of religious tradition, communities living in and around forests used the forest resources freely in order to meet their physical and intellectual requirements (Bose, 1916). The amount of grass cut by each family was strictly regulated and there were community rules prohibiting lopping of leaves in hot weather. "With the planting of timber trees, the jungles preserved within the boundaries were jealously guarded by villagers nearby" (Guha, 1989: 31). This evidenced that apart from religious and cultural regulations regarding resource use, some informal institutional practices of Forest Management were in force.

Still one question arises— what was the roll of the King in managing and administering forest resources within such localised, community-based management practices? Although literature on this topic is scarce, officially the conservation and management of forest resources in ancient times was conducted by the then King, yet it is evident that the King had very little influence on the community except via revenue earning and leadership-determining authority. This may be absolutely true in cases of very ancient or primitive times. Later on, professional

forest management practices were gradually incorporated. In this context, Khan (1998a: 145) noted “(b)esides the argument that forest constituted a part of religious –cultural heritage of ancient India, some later kingdom also demonstrated organized attempt in professional forestry management.” Information about the Maurya period is available from sources such as Kautilya’s *Arthashastra* (321 BC), *Indika of Megasthenes* (305 BC), and *Mudrarakshas of Visakhadatta*, inscriptions of Ashoka (273 BC – 236 BC). Citing the references of Dwivedi (1980: 7-8, 10), FRI (1961: 72), Rahman (1993: 21-22), Biswas (1988: 4), Padhi (1982: 31-32) and Bachkheta (1984: 1), some unique examples of institutional resource management in India were mentioned by Khan (1998: 145), which may be summarised as follows. There was a well-framed management of forests during King Ashoka’s period (273 BC- 236 BC). Plantations of fruit trees, medicinal plants and shade trees for public welfare were ordered by the king. India was a country teeming with mountains, fruit trees, wildlife and forests, as noted in the *Indika of Megasthenes* (305 BC). The book *Arthashastra of Kautilya (The Economics of Kautilya)* written by Chanakya, the then premier of King Chandra Gupta Maurya (321 BC), evidenced that there was a regular Forest Department practicing institutional Forest Management during that period. *Kupyadhyksha* (Superintendent of forest products) was the head of the department assisted by a cadre of Corporals (Forest Guards). There were revenue collectors (*Gaulmikas*), and for maintenance forest roads (*Rajmargas*) were constructed.

Though in ancient times the forests were community-managed almost without interference from the ruler’s side and sustainability of forests was maintained without neglecting local peoples’ needs, there was still evidence of mass forest destruction as a result of wars among many tiny kingdoms in the Indian sub-continent. During 800-1400 AD, the Indian sub-continent was divided into many tiny Kingdoms which were engaged in ceaseless skirmishes amongst themselves (Rahman, 1993; Dwivedi, 1980; FRI, 1961; cited in Khan 1998a). These relentless conflicts warranted large scale forest felling for defence purposes (Khan, 1998a). From the above facts, it may be gleaned that this kind of conflict also occurred in CHT forests, inhabited by about 12 indigenous ethnic communities.

Pre-colonial Era: Mughal Era

During the Mughal period (1526-1700 AD), the forests of Bangladesh, as a part of the then Bengal, were managed based on the policies of utilisation approaches and aesthetic value maintenance. The Mughals had a utilisation and aesthetic approach towards forests without any

comprehensive outlook (Dwivedi, 1980), and hence the state was not particularly keen to restrict local demands for and access to forests (Khan 1998a: 145). Their major intention was to utilise forests as an ‘imperial hunting ground’ as and when required, and for ornamental purposes as much as possible. They used forest as *Sikargah*, or game reserve (Rahman, 1993: 22). Akbar, the greatest Mughal, started canal-side planting with the intention to give the plantation the look of a “canal under the tree in paradise” (FRI, 1961: 72). Akbar, who evinced interest in the planting of trees along canals, directed that on both sides of the canal down to Hiaasr, trees of every description, both for shade and blossom, be planted so as to make it like the canal under the tree in paradise (Agarwala, 1990: 28). Despite this, there was evidence of research on the wood quality of different tree species during Akbar’s period. As indicated in the *Ain-I-Akbari*, heavier and lighter woods were recognised by weighting different kinds of wood. This indicates that with a few exceptions of managing forests as game reserves and for beautification purposes, community management of forests without negative intervention from the ruler’s side in respect of community rights for forest resources use was in existence in the Mughal era.

There are some exceptions also, where agriculture had emphasis over forestry, and thus there being limited forest clearing to make land for agriculture purposes (Dwivedi, 1980; FRI, 1961; Rahman, 1993; also cited in Khan, 1998a). Some forest tracts or patches were granted to individuals or families; for example, Mughal emperor Jahangir granted Atia Pargana of Tangaijl district to his physical training instructor Munayam Khan and Bhowal forest was granted to the then Gazi family of Gazipur district. (Ahmad, 1938, cited in Khan, 1998a). However, no evidence of the granting of forest land in CHT during Mughal period was found, and as such it may be opined that community management of forests did not face hindrance during the Mughal period in CHT. Moreover, ethnic hill communities of CHT had a non- government, institutionalised timber market in Dhaka during Mughal rule. Dhaka was a ship building centre fuelled by trees from CHT in the Mughal period (Khattak, 1979). The undertaking was controlled by urban businessman, who used forest-based communities, especially the hill tribes, as paid or contractual labours (Khan, 1998a: 148). This is an indication of valuable surplus timber production in CHT at that time.

Colonial Era: East India Company

Colonial intrusion in the Indian sub-continent came into being through Bengal (of which Bangladesh was then a part) in 1757. A British

chartered commercial corporation, the East India Company, came out victorious in the battle of Polasi. Being a commercially motivated private company, their policy was “rampant profiteering” as Gadgil described (1989: 9). Forest resources in Bangladesh were utilised as part of that rampant profiteering policy during the East India Company’s rule (1757-1857). Though the commercial use of forest products from CHT was initiated on a small scale during the Mughal period by the ship building businessmen of Dhaka, commercialisation associated with the alienation of local people started with the colonial intrusion of the East India Company. The process of commercialisation of forest use and the consequent alienation of local communities was sparked by colonial intrusion in the Indian sub-continent (Khan, 1998a: 148).

Because of their profiteering policy, government administration was shaped as an unorganised, locality-based administrative system to earn as much revenue as possible for the company. There was no system of government in Bengal, but merely the tradition that unlimited sums of money might be extracted from the natives by the terror of the English name (Hunter, 1893: 453), which was the case in Forest Management also. Commercial exploitation of forest produce gained momentum without consideration for the needs and rights of local communities. Consequently, alienation of local communities was sparked and quickly accelerated. This period was characterised by an unprecedented monopolisation of forests by state authority, maximisation of revenue, and a growing proliferation and fortification of commercial industrial interests in forestry (Fernandes et al, 1988; Fernandes and Kulkarni, 1983; Padhi, 1982; Nadkarni, et. al., 1989; cited in Khan 1998a). The company’s only interest was in profit and they took resources via predatory activities to fulfil their interests (Edwardes, 1967: 47). This uncompromising zeal of revenue maximisation was often saddled on coercive forces and oppression (BDR, 1978; Hartmann and Boyce, 1983; Hunter, 1893; Edwardes, 1967; also cited in Khan 1998a).

Khan (1998a) cited some examples of commercial exploitation of forest resources in Chittagong (CHT was then part of Chittagong), mentioning correspondence between the Port William authority and the Chief of Chittagong. From this correspondence, it can be understood that at that time the soil was very fertile. Mountains were rocky and covered with large, valuable timber species. All kinds of grains especially, wheat and rice, were plentifully produced at that time. Minor forest produce extraction was also conducted. The fertile timber

ground of Chittagong fell under massive commercial timber exploitation. Wood was used for shipbuilding, construction (especially expansion of the railway), network development and export, among other things. Additionally, timber was extensively used by the British Royal Navy. The Port William authority in Calcutta quite regularly requested for Chittagong timber and it was honoured by the then Chief of Chittagong. Huge quantities of minor forest produce, especially bamboo, were also exported through river traffic from Chittagong. Wildlife was also exploited as much as possible by commercially motivated businessmen.

Up until the mid-19th century, forests of the Indian sub-continent, on the whole, were subjected to exploitation on a gigantic scale (Rahman, 1993: 22; Dwivedi, 1980: 12). With supplies of British oak dwindling, huge quantities of Indian Teak (*Tectona grandis*) supplemented the requirements of the British Admiralty's Fleet, including the Royal Navy (FRI, 1961; Dwivedi, 1980; Bachkheti, 1984; Padhi, 1982). Rapidly growing 'Military Centres' throughout India and the construction and fortification of public buildings for expanding state machinery caused heavy felling of the best quality timber (Bachkheti, 1984). Railway expansion saw unexpected assault on nearly all accessible forests (Tiwari, 1986: 16). In addition to timber, trees of ornamental and sundry uses were also felled (FRI, 1961: 72). Ships loaded with timber were regularly shuttled between Chittagong and other parts of India, especially Calcutta (Hunter, 1876). During a period of only six months, 52,225 timber logs and 694,930 bamboo beams were exported through river from Chittagong alone (Hunter, 1876: 194). At that time, CHT was a part of Chittagong district and the unorganised, localised commercially motivated forest management practices resulted in huge, unsustainable destruction of forests by utilising ethnic people as paid labour, and in many cases through applying force.

Besides the predatory commercial exploitation of timber and other forest produce, huge clearances of forested land were also evidenced in the then government's policy of cultivation and expansion of cotton, indigo and tea, etc. These exotic commercial crops were almost entirely a European monopoly (Edwardes, 1967: 83; Khan, 1998a). Ethnic women in the hills of Chittagong and the Chittagong Hill Tracts were engaged in the hard labour of cotton plantation. In the 19th century, raw cotton formed, undoubtedly, the most valuable export from the hill tracts (Hunter, 1876: 200-203; also cited in Khan 1998a: 154). Similarly, many forest tracts and wastelands were converted into

tea estates. It was a 'mania' of the European planters to plant tea (Hunter, 1876: 209). This 'mania' of tea plantation in the hills by the Europeans was propagated due to the government policy of promoting the tea business as an industry. Tea as an industry was pioneered by the government based on purely commercial motives (Khan, 1998: 155). And, in this way, large expanses of easily accessible areas were converted to tea states. An enormous portion of the total area of wasteland within easy reach of a river, a road, or a village path was ceded to tea estates (Hunter, 1876: 209-211). In many cases, planters expanded their planting area gradually. Planters recklessly devastated the forests in their vicinity to supply their requirements (Stebbing, 1923: 433). Many village lands were also taken into the lots without compensation paid in consequence (Hunter, 1876: 210). These activities of commercial plantation establishment and expansion were somehow resisted in many places by the ethnic people but resistance undoubtedly failed due to government policy and back-up enforcement in favour of the European businessmen. The result was alienation of the local people from their territories and neglect of the forest use rights of the nomadic tribes, feeding their growing discontent (Hunter, 1876: 211).

At that stage, tobacco plantation was also prompted by commercial considerations, creating similar repercussions as tea gardens. Tobacco plantations were also patronised by the government, which led to a similar effect on forests and wastelands as those of tea estates (Khan, 1998a: 156). Another example of government patronised commercial exploitation of forest produce, particularly in the name of firewood collection, was the supplying of fuel wood for the purpose of salt manufacture. Salt manufacture was another commercial venture which also took considerable toll on forests and local people (Khan, 1998a: 156). The East India Company had a monopoly over the salt trade and a portion of the salaries of the civil servants came from the profits of the trade (Hunter, 1893: 455-456).

In this period, alongside these central demands for timber and exploitation of forests by different commercial enterprises, another manner of forest destruction and gradual delineation of local people's rights to forests was the intervention of a forest leasing system by the then government. Forests were leased out by the government to commercial contractors (Khan 1998a). During the 18th century, there was evidence of leasing out patches of Chittagonian forests (BDR, 1978; cited in Khan 1998a). This system of private leasing of forests for commercial exploitation was highly patronised by the then

Government, as evidenced by BDR (1978: 391-392, document 4.80). In this way, Chittagong's forests, including those of the Chittagong Hill Tracts, were under a government patronised leasing system of commercial exploitation by forest contractors.

Extension of agriculture in lieu of forest was another way of policy implementation by the then government for enhancing revenue maximisation. The extension of agriculture which entailed considerable clearance of forests received priority over forestry and was encouraged by the government (Khan 1998a: 157). Extension of tillage was considered as the chief care of the government and no regard was paid to the improvident waste of jungle on all sides (Hunter, 1893: 622). The main agricultural innovations existed in all attempts to exploit, and in some cases, introduced exotic commercial crops (Edwardes, 1967: 82-83). Hunter (1876: 164) cited that the Collector of Chittagong, in 1871, reported to his authorities that a good deal of land near the hills and jungle land is let on terms very favourable to the cultivators, in order to encourage the extension of tillage. FRI noted that "forests were considered as an obstruction to further development of agriculture. At that time, the general policy was to expand agriculture and to obtain teak and other timber" (1961: 72, also cited in Khan, 1998a: 157).

From the above evidence, it can be concluded that in almost all cases commercially motivated forest management practices were predominant in East-India Company-ruled Chittagong. There was virtually no Forest Department to look after the forests, i.e. systematic forest management was absent. The civil administration, particularly the Collector of Chittagong, was the sole authority and government policy was to patronise revenue maximisation through different means, which ultimately resulted in the destruction and clearing of huge areas of forest land. Ethnic people, including ethnic women, were engaged as labour, in most cases, by enforcing such commercialized activities. Alienation of local people began and gradually gained momentum. The period between the 18th and the mid-19th centuries witnessed a state patronised process of heavy exploitation of resources (Khan, 1998a: 158).

As in other upland areas of India, localised community-based forest management practices, that were started in the ancient times and continued up until the Mughal period without any significant hindrance in maintaining community people's rights and privileges, were suddenly adversely impacted by the East India Company's introduction of commercial exploitation of forest resources. This resulted in the

initiation and gradual increase of alienation of local people from their forests and neighbourhoods. This unsystematic, poorly administered commercially driven management of forests left its legacy in the future organised structure of forest management, keeping the same commercial motive in process.

Colonial Era: British Government

The British Government ruled India during the latter half of the 19th century until 1947, when India and Pakistan were formed. In 1858, the organised colonial British Government took over the administration of India, after a bloody battle with the native soldiers under the East India Company's rule. In this period, the commercialisation impetus, initiated during the Company's rule, was consolidated. Though the transfer of the administration was aimed at the creation of a rational and efficient administration under the British crown, in reality, the colonial activities during the Company's rule were provided with organised support under a more structured setup for maximum revenue earning. This period saw the consolidation of commercialisation of forest use, the formation of a state forestry organization and policies, more organised attempts towards exploitation and revenue maximisation, state monopolisation of forest ownership, regeneration activities, and systematic restriction of local rights and access to forests. The irony of the fact is that, all the above activities were performed purely with commercial motives.

The first step towards regular conservancy of forests in India was also prompted by commercial motives (Khan 1998a: 159). Several forest committees and commissions were appointed to ascertain the availability of timber, its royalty, etc. In 1806, the post of Conservator of Forests in India was first created, purely on commercial motives, to maintain a regular supply of timber to the navy. The work of the Conservator was to arrange the exploitation of forests (Dwivedi, 1980: 12).

During the period under the British crown, the first outline of forest conservancy in India was promulgated by the Memorandum of the Government of India, dated 3 August 1855. This memorandum was termed the 'Charter of Indian Forests,' and with this the footing of scientific management of forests came into being, as some realisation of forest maintenance seemed to have been accounted for and occurred, though the main ruling principles were still those of commercial exploitation. According to the Charter of Indian Forests, teak timber should be retained as state property- trees which have reached

exploitable size should be removed in conformance with the future maintenance of forests (cited in Rahman, 1993: 22; Khan, 1998a: 159). According to Khan (1998a: 160), “(t)he so called scientific forestry had its footing by this time whose predominant works included the state appropriation of forests, maximization of organized exploitation, building logistics and communication networks, artificial “mono-culture plantations” and hatching the growth of the future ‘invincible’ bureaucracy.” Until that time, Bengal forests had not been targeted for “conservation through scientific forestry” (FRI, 1961; Padhi, 1982; Dwivedi, 1980; cited in Khan, 1998a). Hence, this scientific forestry was not actually designed for forest conservation.

The year 1864 is a milestone in the history of forest management in India. The Forest Department under the Government was launched in this year. A professionally trained German Forester, Sir Dietrich Brandis, was appointed Inspector General of Forests, India. With this, the foundations of scientific forestry were firmly laid down (Rahman, 1993: 22) and major steps towards the consolidation of the state authority over forest management were witnessed (Khan, 1998a: 160). The formation of the Government Forest Department was conceived with the goal of reservation of forests as well as gradual elimination of private rights and privileges in and around forests. This was clearly evidenced by the Governor General’s letter to the then secretary of state dated 1 November 1864, which reads “The idea of allowing proprietary rights in forests to individuals should be abandoned, as such rights were almost certain to lead to destruction of forests concerned. It was considered necessary that all Government forests should be strictly set apart and made inalienable. It was conceded that provision would have to be made for the continued exercise of certain private rights already existing, but it would be a good policy to extinguish even those rights-wherever possible” (cited in FRI, 1961: 76).

The above statement by the Governor General virtually initiated the formation of the Forest Department and acted as a guideline for forestry activities during British rule. This comment made room for the start of demarcation of forests as ‘reserve’ and gradual delineation of local peoples’ rights through the formation of the first Forest Act (Forest Act 1865). Accordingly, from its very birth, the Forest Department has been expected to foster proprietary rights of the state over nearly all major forest areas and also to ensure a clear seclusion of local people from government forests (Khan, 1998a: 160). The impact of this first attempt of forest legislation in British India was that a

series of restrictions on local rights made forests progressively inalienable. Provision for declaring reserved and protected forests was first made by this Act. The inherent theme to managing reserve forests was strictly based on state property, with 'Reserved' and 'Protected' forests demarcated by survey. Any sort of cultivation, cattle grazing, etc. was also not allowed. Government officers were granted a lot of power to implement this Act. According to this Act, a government officer's role was to preserve all growing trees, shrubs, and plants by prohibiting all sorts of felling, and even the collection and removal of leaves, fruit, grass, wood oil, resin, wax, honey and elephant tusks, i.e. any renewable and non-renewable resources from such forests. Such a prohibiting Act was executed by denying local people entrance, even for cattle grazing, in state forests. It also made government officers invincible against any public protest by the inclusion of such provisions as "No suit or other proceeding shall be commenced against any person for anything done in pursuance of this act" (Stebbing, 1923: 11; Khan 1998a). With this Act, the removal of local peoples' rights to forest resource use was further consolidated. A well-organised form of alienation had found its footing. Stebbing (1923: 14) noted that this Act also made provisions for the construction of reserved and protected forest, and forest officers endeavoured to put the rules in force with uncompromising vigour against local populations. This Act caused growing discontent and alienation among locals (Khan, 1998a: 161). Cultivation by hill tribes was prohibited and cattle were excluded from grazing (Hunter, 1893: 625). In this fashion, we can say that the alienating impact of this Act in CHT had a major impact as cultivation as well as other sorts of livelihood rights enjoyed by the ethnic people were strictly prohibited and executed with uncompromising zeal.

During this period, based on the regulations and Act formulated, as discussed earlier, state monopolisation of forest continued by forming reserved and protected forest almost throughout the then India. Side by side leasing out of forest to private traders, which was initiated during the East India Company's rule, was also in continuity, thereby commercial exploitation ran in equal momentum and in timber rich areas, it accelerated also. Until nearly the end of the 19th century, the Government view was to open forests to private enterprises (Bachkheti, 1984: 5; cited in Khan 1998a: 163). The Calcutta-based timber merchants had their agents in Bengal who ensured regular export of trees from different areas of Bengal's forests (Hunter, 1876; cited in Khan 1998a: 163).

In 1864, under the control of the Inspector General of Forest, India, the post of Conservator of Forests for Bengal province was virtually

created. It is mentionable here that, in the year 1862, Dr. Brandis, who was later appointed as the Inspector General of Forests, India, inspected a section of forests in the then Bengal (present Bangladesh). Upon his inspection, he made a note on the forests of this region. These notes marked the beginning of Forest Management in Bengal. Forest conservancy in Bengal started in 1864 with the appointment of Mr. Anderson as the Conservator of Forests for the lower province of Bengal (FRI, 1961; Dwivedi, 1980; Rahman, 1993; also cited in Khan, 1998a). The initial task of the Conservator was exploitation of timber from forests and revenue earning. The organised form of government intervention for forest management got its footing via more organised commercial extraction of forest resources and alienation of people's rights. Stebbing (1923: 375) noted that the first task of the conservator was the exploitation of forests and establishment of a timber depot for extraction and trade. By the mid 1860s, the home authorities were fully awake to the fact that the introduction of forest conservancy, so far as conserving and perpetuating timber supplies, had become a question of first importance. According to Khan (1998), the process of reckoning forests as a prospective commercial commodity started long before and it assumed an organised form through government intervention for forest management.

Chittagong, forming part of the extraction zone for valuable timber sources in Bengal, undoubtedly fell under the same intervention. A Forest Division was established in Chittagong in the early days of forest conservancy in Bengal, embracing forest territory of the present Chittagong, Chittagong Hill Tracts and Cox's Bazar. The Chittagong Forest Division was one of the first forest divisions to be formed in undivided Bengal (Revised Working Plan, 1978-79 to 1987-88: 71). Prior to being taken over by the Forest Department, the forests were under the management of the Revenue Department as *Khas Mahal* Forests. At that time, forest toll stations were under the ethnic 'hill chiefs.' In the *Khas Mahal* Forests, rules were somewhat flexible and local people could meet their needs to some degree (Khan, 1998a: 164).

After takeover by the Forest Department, the charge of forest toll stations was placed under the Forest Department's control for revenue maximisation, and therefore, the above-mentioned flexibility and local peoples' access to forests were further hindered. Since the launching of the Forest Department until the last decade of the century, forest policy in this region centred around "creating reserves and collecting revenues" (Khan, 1980: 71; cited in Khan, 1998a: 164). The charge of forest toll stations of the Chittagong Division were taken over from the

ethnic hill chiefs by the Forest Department (Khan, 1998a: 164). The indigenous authorities in hill communities were overruled by the state and a more rigorous method of collection was at once installed with a great rise in revenue and thereby consequent great fall in flexibility of rules as well as decrease in opportunity for local people to have their demands met (Cowan, 1923: 19; also cited in Khan, 1998a: 164).

Massive 'reservation' work started from the 1870s onwards with proportional reduction of local rights (Khan, 1998a: 164). Almost all the Chittagong Hill Tracts were declared as government forests and a major portion of land was converted into 'Reserved' in the 19th century. Via notification in the Calcutta Gazette dated 1 February 1871, nearly the whole Chittagong Hill Tract district (5670 square miles of a total 6882 square miles) was declared as government forest under Section 2 of Act VII of 1865 (Cowan, 1923; Ghani, 1955; Baten, 1969; Khan, 1980; Khan, 1998a). In the year 1875, the then Conservator of Forests of Bengal, Sir William Schlich, visited Bengal and his visit was reported to have marked the beginning of a new era for the management of Chittagong's forests (Khan, 1980: 72; also see Khan, 1998a: 164). In his report, the Conservator's views about the indigenous practices and local rights in the then Chittagong Hill Tracts forests can be understood from the following passage:

The system of forestry in force in the Hill Tracts until a few month ago may be shortly described as follows: The hill men had the free run of the forests for their domestic requirements... Individuals who desired to export forest produce had to take out a so called permit to cut... The effects of the above system had been detrimental to the forests as the free run of them and the almost unrestricted cuttings told very severely on the growing stock of timber... The great enemies of forest conservancy... were the practice of *jhuming* (and) the wasteful manner in which timber had been cut... In short, there can be no doubt that the forests were on the road to ruin (cited in Khan, 1980: 72; Khan, 1998a: 164).

Accordingly, after the visit of the Conservator of Forests, massive reservations of earlier government declared forests began in the name of saving forests from the road to ruin. As a result, the following years witnessed a constant rise in levies, tolls, and the expansion of reserves (Khan, 1998a: 165). The age old practice of growing agricultural crops by nomadic ethnic people, i.e., *jhuming* (an indigenous form of shifting cultivation practiced by ethnic and indigenous communities), and all options for people to access reserved forests were strictly forbidden. Sungoo, Maini and Kasalong riverside valley forests were declared

reserved. These newly formed reserves were primarily inhabited by hill tribes and aborigines who were forced out from their forested habitats near the river valleys (Khan, 1998a: 165). During this time, plantation of exotic species became popular in CHT. Teak seeds obtained from Burma were planted in Sitapahar and Pahartali (Cowan, 1923: 19). Mono-culture trials of exotic species were also carried out, side by side the process of creating reservations (Khan, 1998: 165). Ever expanding reserves also necessitated huge expenditure (Cowan, 1923: 22), and consequently more importance was attached to revenue maximisation (Khan, 1998a: 165), thereby further alienating the local people.

In 1878, operation of a new Forest Act (Act VII of 1875) was implemented (also mentioned on pages 64-65 under the heading Forest Acts, Rules and Regulations). This Act emphasises the formation of more Reserve and Protected forests. Already formed protected forests were converted into reserve forests and more new protected forest formations were also demarcated. Stebbing (1923: 470) noted that in 1889-90, there were 56,000 square miles of protected forests in British India. By the end of the century, reserve forests were extended to 81,400 square miles while protected forests were reduced to 8,800 square miles. According to Khan (1998a: 165-66), a process called forest settlement work (which has continued to be a major duty of foresters up until today) was very common throughout the Indian public forests during the period between 1871 and 1900. Its main purpose was to demarcate and settle governmental proprietorship and royal rights over community or private rights.

Since in protected forests, some form of existing peoples' rights were at least recorded, although not settled, the government did not seem to compromise with its ever growing monopolistic proprietorship; therefore, protected forests were gradually converted into reserves (Stebbing, 1923: 470; cited in Khan, 1998a: 165). The operational severity of this alienating process further increased with the instructions of Mr. Ribbendrop, who later became the Inspector General of Forests.

Forest Reservation in the Chittagong Hill Tracts was progressively expanded in the same way. Reservation work in Chittagong's forests went on apace with other parts of India (Khan, 1998a: 166). It is mentionable here that this Act of 1878 made provision for "village forests" with the intention to fulfil local needs. It partially seemed to be beneficial to the local people, but failed to provide the required benefits due to the rigorous emphasis on creating reserved forests as demanded by the Act. Accordingly, bitter feelings between the government and

local communities grew, clearly evidenced by a sharp increase in forest offences in the reserved forests. However, some remedial measures were taken to minimise the number of forest offences by decreasing bitterness against reservation activities. Communication and construction activities were carried out, logistic and manpower supplies were enhanced, patrolling and policing were intensified, and many inspection paths and rest houses were built (Cowan, 1923; Ghani, 1955; also cited in Khan, 1998a). However, these had little effect in appeasing the growing bitterness between the government and local communities (Khan, 1998a: 166).

The irony of the fact is that continuous increase of offences by local people in reserved forests gave the government justification for creating more reserves, resulting amplification of public discontent. In many cases this discontent reached extreme heights and was difficult to control, with almost all the people in a particular locality directly involved in offences in the reserved forests. In line with similar occurrences in other parts of India, these happened crucially in some of the heavily ethnic inhabited areas of CHT. Khan (1980: 76, also cited in Khan, 1998: 166) gave an example of such, stating “120 cases involving 1059 persons) of “forest offences” (concerning *jhuming* by the locals) in 1905-6, led Maini reserved forest (an area of 337 sq. miles) to be declared ‘disforested’ (deforested).” This example is an indication of resistance by the local people of CHT against obstructions to forest rights and privileges which they enjoyed earlier.

A general history of forest management as described in different working plans of Chittagong and Chittagong Hill Tracts Divisions may be summarised as follows:

The Chittagong Hill Tracts was first a political charge. Before constituting a district in 1860, CHT was put under the administration of the Collector of Chittagong and a superintendent was put in charge. In 1862, establishment of toll stations on the main rivers was initiated to collect dues from forest produce, which was floated down in large quantities to the Chittagong market, a portion of which was floated towards Calcutta and also to Dhaka for ship-building and other related purposes. At that time, tolls were collected by the district officer in the name of revenue collection from *Khas Mahal* Forests. With the passage of time, it was felt necessary to constitute some of the forests as reserved and Chittagong Forest Division was created with the territory of present Chittagong, CHT and Cox’s Bazar. Initially, the reservation of forests was started only in CHT and gradually spread outside of CHT. Until 1871, i.e., before the Forest Department took charge of toll

stations, the hill chiefs were given power to collect tolls. This system was in force from 1864 to April 1871. The Karnafully tolls were farmed to Rani Kalindi Chieftainess of the Matamohori and Bakhali to the Bomong chief. In 1868, Mong Raja was appointed to collect tolls on the Feni, Dherung and Sarta rivers. An Assistant Conservator of forests was appointed in 1870 to take charge of the Chittagong Forest Division. In 1871, by notification in the Calcutta Gazette dated 1 February, 1871, nearly all the Chittagong Hill Tracts district, viz. 5670 out of 6882 square miles, was declared government forest in accordance with Section 2, Act VII of 1865. Systematic inspection of forest tracts was started, but the subordinate forest staff were actually engaged mainly in collecting tolls. The importance of the year 1871 was also claimed due to the start of teak plantations in Sitapahar in Kaptai, collecting teak seeds from Burma. In the year 1909, the original Chittagong Forest Division was divided into two divisions, namely Chittagong Forest Division and Chittagong Hill Tracts Forest Division. Later, with the passage of time, the Chittagong Hill Tracts was divided into three districts and eight forest divisions, which continue today. In the year 1875, Sir William Schlich, KCIE, the then Conservator of Forests of Bengal, inspected the forests of Chittagong and the Chittagong Hill Tracts. His inspection marked the beginning of a golden era for forest management in this region. The following paragraphs have been extracted as cited in the Revised Working plans for the forests of Chittagong Division for the years 1978-79 to 1987-88, v-1:72-74 are as follows:

The system of forestry in force in the Hill Tracts until a few months ago may be shortly described as follows:

- a. The hill man had the free run of the forests for their domestic requirements.
- b. Individuals who desired to export forest produce had to take out so-called permit to cut or remove the materials.
- c. On passing certain stations situated on the bank of the rivers coming from hill tracts, Government levied a toll from the forest produce according to a sanctioned scale.
- d. The Commissioner of Chittagong was ex-officio Conservator of Forests for Chittagong and the Assistant Conservator of Forests was subordinate to the Deputy Commissioner of the Hill Tracts and through him to the Commissioner.

The effect of the above system has been detrimental to the forests as the free run of them and the almost unrestricted cutting toll has

severely depleted the growing stock of timber. Thus, the supply of the first class timber trees has become very limited. One of the enemies of forest conservancy was the practice of *jhuming* in the greater part of forests and the wasteful manner in which timber was cut. Although *jhuming* may not periodically cut and burn all seedlings, saplings and young trees, the practice hampers reproduction partly due to the fact that mature trees are removed year after year.

From the above inspection report, it may be opined that the organizational set up and the working procedure of the then forest management was on the proper track. Destruction of forest was very severe due to unsystematic and environmentally unfriendly exploitation of forest produce. The age old *jhuming* practice of ethnic people cannot be banned in all forests. Organizational management, technical management, and local people's access to forests should be modified to introduce better forest conservancy in practice. This inspection report undoubtedly gained importance in respect to making provisions for peoples rights and access to forests, at least to some extent, as it shed light on the fact that local peoples' needs and livelihood in CHT were recognised by the then Conservator of Forests of Bengal. Furthermore, with the government policy of revenue maximisation, the Conservator emphasises the intervention of scientific management into forests in line with the surrounding human-related environmental reality.

Based on farsighted observations, the Conservator suggested the forming of reserves and district forests. The reserves were to be entirely under the management of the Forest Department and district forests under that of the Deputy Commissioner of the Hill Tracts. No *jhuming* or cultivation of any other kind was to be allowed in the reserves, and no timber or other forest produce to be cut or removed from the reserves without the permission of the Forest Department; the area was to be managed for forest purposes only. The people of the district were granted access to supply themselves with forest materials for their domestic requirements from the district forests, within restrictions that the Deputy Commissioner may impose from time to time.

Those proposals were accepted by the then government, and Maini, Kassalong, Sungoo and Rangkheong valleys in CHT were declared reserves. For the administration of district forests, in which about 80,000 people lived and *jhumed*, a policy was drawn up. Accordingly, forest administration and management was reshaped. Reservation and

demarcation continued. The total area of Reserved forests in CHT in the year 1984 amounted to 1,354 square miles.

Though the farsighted proposals by the then Conservator of Forests somewhat minimised local people's bitterness towards restrictions for use of forests, by creating separate areas, reserves and district forests, and recognising local peoples' rights and granting access to district forests, the policy of the then government to expand reserves by decreasing district forests, became a great challenge in the process of minimisation of such ill feeling. Furthermore, the forest area started shrinking due to the clearing of forest areas for cultivation purposes from 1984 when the first forest policy of British India gave preference to agriculture over forestry. (A historical synthesis of forest policy can be found below in this chapter in a separate heading).

The year 1927 marks another milestone in the history of forest management in British India with the enunciation of Forest Act, 1927. This Act detailed systematic procedures for forming reserved and protected forests, and at the same time, radically increased the government's power to create reserved and protected forests. It also itemised a host of punitive or regulatory measures regarding cattle grazing, forest settlement, local rights and the control of timber and forest products (Alam, 1992; also cited in Khan, 1998a). Accordingly, establishment of restrictions continued with great vigour and as such the forested area for meeting local demands, i.e., district forest, was continuously shrinking.

In 1930, in line with practice in other provinces of the then India, private forests (forests where proprietary rights are held by a particular person or landlord) in Bengal were taken under state control. This gave impetus to the horizontal expansion of state authority and subsequent proprietorship by the state (Khan, 1998: 168). Accordingly, more laws were passed in this regard, and from the 1930s to 1940s, the government took over control of almost all the private forests. The forests on the Dhaka-Tangail-Mymensingh tract are an example of such private forest. However, such kind of private forests were not in existence in the ethnic inhabited CHT.

During World War II, enormous exploitation of forests was carried out to supply war demands. At that time, working plan prescriptions, i.e., operational schedules for departmental work, were not in action and indiscriminate felling of timber occurred. The Forest Department's main task was the exploitation of already dwindling forests to cater for wartime communication and construction activities. The Forest

Department undertook the organization of the extraction and delivery of all timber required and the huge demand during the war from 1942-45 resulted in all accessible areas of the forests being greatly depleted (Khan, 1980: 80; GOEP, 1961: i-v; Khan, 1998a: 168). Private and community forests were also ruthlessly exploited during wartime (Dwivedi, 1980: 15). Thus, the problems of gradual reduction of local peoples' availability of forest produce due to shrinkage of district forests via the ever-increasing reservations in CHT and other areas were abruptly amplified with the destructive impact of the wartime exploitation of forests.

British colonial rule in India ended in 1947. By then, management of forests for purely commercial motives had turned forest land to ruin. When the sun set on the British Empire in India, eastern Bengal (Bangladesh) had been reduced to an improvised agricultural hinterland (Hartmann and Boyce, 1983: 12; Khan, 1998a: 169). Describing forest management during British colonial rule, Khan (1998a: 168) summarised,

In sum, the colonial period was marked by state monopolisation of forest ownership, intrusion of commercial interests into local economy, and a systematic denial of local rights. The trends in forest commercialization were sparked by the early company rule which was characterized by "rampant profiteering" and maximized exploitation. Since the mid 18th century, more organized forms of government and state activities were noted. However, the basic trends in commercialization and alienation continued unabated. This later phase of organized governmental activities also witnessed the introduction of bureaucratic forest management whose main purposes being revenue maximization, restricting local rights, further expansion of state control and proprietorship, and more stringent rule enforcement.

Thus, CHT, once a land of lush green forest vegetation, with sources of high quality timber, being discovered by the then colonial government was subjected to all modes of exploitation for the commercial interests of the colonial government, gradually, yet crucially, sacrificing the local people's interests.

a. *Post-colonial Era: Pre-independence (Pakistan Era)*

In the year 1947, after the end of the British period, the Pakistan period began. In the early days of this period, the British policy of forest resource management continued. Even in the later days of this period, there were little changes in the nature of forest management in East Bengal. Therefore, forestry practices were no different to those during

British colonial rule. Moreover, forest activities adopted in the British period were gradually intensified due to the given emphasis on greater natural resource exploitation for industrial development and revenue earning. Khulna Newsprint Mills, North Bengal Paper Mills and Rayon Complex at Kaptai, Chittagong, were all established during this period. The industries required huge amounts of raw materials extracted from forests. Alongside this, with state support and protection, many small forest-based industries, such as particle board, hardboard, plywood and match factories were established by private entrepreneurship. These entrepreneurs were mostly from the then West Pakistan, who ran these industries with purely commercial motives. At that time, East Pakistan, i.e., the present Bangladesh, was a province of Pakistan, and the capitalists from West Pakistan played the role of colonial rulers. As a rule, industries in the Pakistan period received overwhelming state support and protection, fed West Pakistan markets, and most of the benefits derived from these industries were funnelled back to their entrepreneurs who were mostly West Pakistani capitalists (Roy, 1987: 26; Alam and Rahman, 1993; Khan 1998a: 170).

Until the late 1950s, according to Zabala (1990: 12), development of forest industries remained almost entirely confined to a group of private capitalists, implying the pure commercial focus of the regime. However, in 1960, there was a small change in motive with the formation of the East Pakistan Forest Industries Development Corporation (presently known as Bangladesh Forest Industries Development Corporation). With the inception of the corporation, mechanised extraction of timber started in the accessible hill forests. With mechanised extraction, the corporation contributed to further depletion of the hill forests. Bamboo was also mechanically extracted in huge quantities to feed the Karnafulli Paper Mills. The irony is that until today the corporation is incurring loss with only a few exceptions, yet this does not alter the damage done to the forests.

Besides this, plantation activities were also in existence in the Pakistan era. These were mainly teak plantations. Up until 1960, the Forest Department's main task was policing people working to raise teak plantations. Roy (1987: 39) stated that until 1960, the Government of Pakistan followed colonial footsteps by concentrating on policing people and raised only 13,163 hectares of plantation. During 1960, a large-scale scheme for plantation was designed. This was primarily focussed on feeding the growing industrial needs of the time (Khan, 1998a: 170). Roy also stated that the existing natural forests were considered low-yielding and unprofitable, and as a result, the best

natural forest areas of the country were replaced by artificial teak forests (1987: 43; cited in Khan 1998a: 170). In the 1960s, 51,197 hectares of natural forests were converted into artificial plantations, mostly of teak.

It is mentionable here that the first forest policy of Pakistan was announced in 1955. This forest policy was similar to the previous policies in the British colonial rule, with minor alterations placing emphasis on industrial extraction and exotic plantation. Teak plantations were advocated over indigenous species and local choice all through the colonial period based on predominantly commercial considerations of high quality timber and nominal planting cost (Griffith, 1941: 129; Khan 1998a: 170). In the same vein, in 1955, the Pakistani government noted that teak was almost certain to continue to be the most important species in future forest plantation programmes, and therefore conversion of natural forests to artificial plantations of mostly teak species continued (GOEP, 1955: 4). In fact, according to Hussain (1992: 18), the first forest policy of Pakistan depicted all characteristic manifestations of the colonial forest administration, including the expansion of state territories, “scientific” extraction of timber, fortification of the bureaucracy by increased training and manpower, and management of all forests through rigid departmental plans.

The second forest policy during the Pakistan period was announced in 1962. This policy placed emphasis on the intensification of forest management as a commercial concern and improved utilisation of forest produce with emphasis on accelerated timber harvesting in Chittagong and the Sundarbans. Plantation activities were also incorporated to keep regeneration apace with increased timber harvesting. Ironically, both Pakistan forest policies gave little consideration to, and in most cases ignored, the local peoples’ needs and rights in forests. Thus, with Pakistan governing, the forests and the people of CHT faced similar, yet intensified, conditions to those they faced during British rule. In other words, local people’s rights and demands remained ignored as they were by the British colonial regime. Increased exploitation for industrial purposes also depleted the existing forests which were over burdened by mechanised extraction and conversion of natural forests to plantations with ultimate augmenting of the negative impact on forest biodiversity.

b. *Post-colonial Era: Post-independence (Bangladesh Era)*

After the end of the Bangladesh Independence War in 1971, Bangladesh (previously East Pakistan) emerged as sovereign state. A five-year plan was formulated to commence in 1973, with the intention of rehabilitating the war-damaged economy and push for economic growth through the public sector. Immediately after the end of the first five-year plan, another five-year plan followed from 1978, with similar aims including raising plantations to meet industrial demands.

These five-year plans may be considered as having influenced the emerging trend towards future social forestry programmes in the country, as they allotted room for the establishment of forest nurseries to support homesteads and to develop rural forestry, which was ignored by the earlier governments. These programmes were enacted very nominally and few nurseries were established, mostly in urban areas. According to Roy (1987: 44-45), the five-year plans for the forestry sector allotted development resources mainly for raising plantations with a view to meeting the future demands for raw materials for forest industries and the potential rural forestry sector, yet the most important forest resources of the country were totally ignored. The notable service offered by the government was in the form of establishing some nurseries, mostly of which were located in urban areas, benefiting a section of the urban population. Thus, though it was a good start for people-oriented forestry development in the country, its reach was very small, and therefore, local rural demands, particularly from the people of adjacent forest areas, were totally ignored and received none of the benefits. Anyhow, via this initiative, forest extension service was enlarged. With these five-year plans, a total of 59 nurseries were established in the country. However, CHT was not included in the nursery establishing program, and therefore, rural homesteads and community forestry in CHT were completely overlooked. The CHT forests were managed as they were managed earlier, for revenue maximisation.

In 1979, the first forest policy of independent Bangladesh was formulated. This policy also took the same view as traditional foresters and thus was inadequate for addressing the needs and crisis of Bangladeshi forestry (Task Force, 1991: 219). Rural and local people received little attention in the policy. Its suggestions included horizontal expansion of forest areas under the government which were to be carefully preserved and scientifically managed, the setting up of new forest-based industries, optimum extraction of forest produce and protection of forests from encroachers. Actually, the policy came in the

form of a two-stage manifesto type statement with “obscure” and “generalized directions” mostly focussed on the Forest Department (Anon, n.d: 5 and 18; cited in Khan 1998a). Although, with this policy, forest extension activities somewhat expanded and as a result, a community forestry project was launched. In this case also, CHT remained outside the reach of these extension activities. Besides, the traditional forestry activities were arranged in CHT with the intention of revenue maximisation by utilising forests on a commercial basis.

Khan (1998a: 172-73), citing the references of Roy (1987: 44), Khan (1980) and Zabala (1990: 16-17), stated that Bangladesh forestry until 1990 showed little change from the traditional colonial-industrial approach to forestry. It concentrated on “managing vast tracts of public owned forest land by a bureaucracy, keeping people out” (Roy, 1987: 44). With the exception of slight reshuffling in the mid 1980s through the launch of a social forestry program, the colonial approach more or less continues to be the dominant trend in the country’s forestry sector until today. It has been said that “sustained yield” is the main “obligation” of the public forest management of Bangladesh (Zebala, 1990:16-17). Under the umbrella of “sustained yield,” the objective of forest management (for different categories of forests) are as follows: a) for the Hill Forests the “mainstay” of forest management is to “convert irregular forests by valuable and fast growing species” and “to derive maximum economic benefit under the principle of sustained yield”; b) for in land Sal Forests the objectives are to bring the forest under scientific management” and “to create recreational facilities in these forests for town dwellers” (Zebala, 1990: 16-17). There has been a near complete lack of any significant provision for rural peoples’ involvement in forestry in pursuing the so-called “sustained yield” principle.

Additionally, the social forestry programmes so far taken into account were for the plain land areas only. Very little attention in this regard was given to CHT, except for a few attempts of rehabilitating nomadic ethnic people in and around unclassed state forests (previously known as *Khas Mahal* Forests or District Forests).

In 1989, Forest Act 1927 was amended. This amendment increased provision for punishment measures of forest offences, giving more power for policing local people and increasing restrictions to government forests. CHT forests, being the most densely forested areas of the country, fell under the newly amended legislation measures to a greater extent than those of thinly forested areas.

Bngladesh's most recent forest policy was enacted in 1994, which may be regarded as a milestone for participatory forestry intervention after a long adherence to traditional forestry practices. In this regard, it is intended to write a brief history of forest policy development below, with special reference to participatory forestry, indicating needs and trends as well as legislation adopted and amended. Based on the country's last forest policy, social forestry legislation was drafted and recently adopted. However, there are complications in regards to its implementation in CHT.

Forest Policies in Bangladesh: A Historical Synthesis

To achieve goal-oriented objectives, the first step is the formulation and adaptation of a policy to deal with the articulation of courses of action in the appropriate way. Policy documents typically consist of statements and instruments. Forest policy is the course of action pursued by the government to achieve certain objectives in respect to forests (Banik, 2002: 19). Forest policies are concerned with the manner in which forests and tree resources should be managed to meet societies' demand for goods and services that forests can – if managed properly – provide for current and future generations (FAO, 2003).

Generally, people's livelihoods depend on economic and socio-cultural conditions. Within the economic and socio-cultural environment, people organise themselves in a framework that guides their socio-economic activities. Thus, any activity to achieve a desired goal results in a behavioural change of people due to the influence on the environment in which they live. This creates imbalance and conflict between the people doing the action and those to whom the impact of action is felt. In order to minimise these sorts of problems that may be encountered during any activity in society, policies are required. Forest policies address anticipated problems that arise because of an imbalance between public and private goals (FAO, 2003). By applying different policy instruments, these kinds of conflict resulting from imbalances can be minimised. This is applicable not only on the national and state level, but also at the household and community level. To minimise conflicts via changing behaviour, policy instruments are designed. In this context, appropriate study and proper understanding of the current situation is a must for the proper formulation and adaptation of policies. However, ironically, the Forest Policies formulated and adopted in the CHT area in the British colonial rule and the Pakistan period were based on top-down approaches, to achieve the desired goals of mostly colonial interest by ignoring societies' or

communities' demands. As a richly stocked forest area, CHT was adversely affected by those colonial forest policies.

The British Colonial Policy

There was only customary regulation of peoples' rights over forest lands and forest produce in ancient India, which continued until the advent of the British. Due to the existence of vast tracts of forests and a relatively small population, this system of forest use did not pose a problem. Customs prohibited the cutting of certain trees, and certain forests were regarded as sacred and were protected. People were supposed to use only the fallen leaves and fruits and not to cut them from any tree (Kulkarni, 1983: 84-85). These customary regulations helped the conservation of natural forests along with their gamut of living organisms (Gadgil and Vartak, 1974: 314-320; cited in Kulkarni, 1983: 85).

Colonisation changed this situation of customary regulation of forests. The British colonial government realised the commercial value of forests. They began to utilise forests in order to augment revenue. In view of maximising revenue collection, they progressively tried to regulate the people's rights over forests. All these commercial activities were done in the name of conservation of forests, and in an interesting example, the memorandum issued in August 1865, provided guidelines restricting the rights of the forest dwellers in the name of forest conservation.

This policy was never implemented in full. In actual practice, all these pious declarations were set aside whenever they got in the way of the interests of the British (Joshi, 1983: 26). In fact, greater and greater restrictions were placed on community ownership of forests (Kulkarni, 1983:85). In many parts of India, many ethnic and other forest dwellers opposed this peaceful confiscation of the long-cherished customary rights and privileges of people over forests (Joshi, 1983; FRI, 1961). Thus, it may be opined that there was dissatisfaction in the then ethnic people's habitat of CHT, in respect to people's rights in forests and related issues.

With regards to people's participation in forestry, this policy was far removed from the actual concept, and was antagonistic as a whole. In 1894, the government reviewed its forest policy, providing very marginal rights for people only in very low-yielding forests. In this case also, the issue of people's participation was not addressed.

The Forest Policy, 1894

This is the first Forest Policy formulated and adopted during British colonial rule – vide circular no. 22 – F, dated 19 October, 1894. The salient features are: Forests are categorised as Protective forests, Productive forests, Minor forests and Pasture lands. An important aspect of this policy is that Public benefits are the main objective for administering state forests. To protect the cultivated plains, forests on hill slopes are to be conserved. Productive or valuable forests will be the source of revenue and were to be managed accordingly. Suitable areas for cultivation within forests should be taken under cultivation on a permanent basis without harming the general forest needs of the country. Local people were given grazing rights only in low yielding forests.

Basic guidelines for the formulation of acts and rules for scientific management of forest resources were obtained from this first Forest Policy – the Forest Act 1927 was formulated and most rules and regulations were drafted and processed. Many Reserved forests were also declared under this policy. This is the nation's colonial forest policy aiming at strongly safeguarding the colonial interest, characterised by revenue maximisation through forest resource use for progressive commercialisation. This policy laid down public interest as the sole objective of management of public forests (Millat-e-Mustafa, 2002). Permanent conversion of forest land for commercial agricultural farming, which created hindrances to the rights and privileges of local communities, was started systematically. Hussain (1992) proposed that the policy gave preference to agriculture over forestry by proposing that demands for cultivable land can be to some extent met by clearing forest areas. Khan (2002) stated that the policy gave renewed impetus to the process of land clearing that had long been active in Bengal, causing considerable damage to forested tracts. Rahman (1993) opined that the main aim of the policy was to collect revenue and to satisfy the local population by granting so-called rights and concessions. Royalties for the government were to be collected for various facilities enjoyed by the people (Khan, 2002; also cited in Rahman, 1993; Wadud, 1989). Kannan (1993: 76) commented on the 1894 Forest Policy, saying as “This policy recognized the close relationship between forestry and agriculture and argued that the justification for forestry activities spring from their direct and indirect contribution to the development of agriculture. Even if certain areas are suitable for growing good quality timber, the area should not be utilized for forestry, if the area can support good agriculture. Such an approach

facilitated the extension of agriculture to forest areas, largely benefiting the landed interests and adversely affecting the advises for whom the concept of individual property right over land was almost unknown.”

Thus, the life and livelihood of ethnic population in the CHT region, practicing customary use of forest lands, was badly affected with extensive destruction of forests. Even some of the more productive forest lands were also destroyed in the name of agriculture.

In respect to people's rights, the policy statement was: Forests that only yield inferior timber, fuel wood or fodder or are used for grazing should be managed mainly in the interests of the local population. However, actually this statement was not followed properly, due to safe-guarding of the interests of commercialisation and revenue maximisation. Care was taken to see that forest use was not exercised so as to annihilate its subject and that the people were protected against their own improvidence (FRI, 1961: 330). In this way, the manifold restrictions imposed on people's rights and privileges buried the issue of people's participation so deeply that it could not surface as a concept for policy consideration.

The Forest Policy, 1955

After the partition of India and the creation of Pakistan, it was felt that a new forest policy to better address the needs of the country should replace the British Indian Forest Policy of 1894. On 12 November 1955, the Pakistan government adopted the first Forest Policy of Pakistan. The salient features are: In national development plans, forests should be given high priority. Classification should be made on the basis of utility and intangible benefits should be recognised. Forests should be managed scientifically through approved working plans. Planting canal banks, roadsides, railway tracts, and arable wastelands should increase forest areas and also encourage Farm Forestry. As per government legislation and support, private forests of the country should be placed under appropriate management. Poor quality land use should be controlled for conserving soil, etc.

Accordingly, forests were given high priority in the then East Pakistan's development plans and were classified on the basis of utility with provisions made to manage all forests through approved working plans. Provision for improved timber harvesting, wildlife conservation, soil conservation, and control of poor quality land use was incorporated. Beneficial aspects were given priority over commercial

exploitation and in this way, in marginal and vacant government lands afforestation started to take place. The necessity of fully trained personnel for forest management was recognised. Under this policy, clear felling with artificial regeneration became a general practice. Besides all this, revenue generation was highly emphasised through commercialisation, subsequently resulting in alienation of local communities, and so this approach did not differ much from those of the colonial regime. According to Hussain (1992: 18; cited in Khan, 2002), the Forest Policy of 1955 depicted all the characteristic manifestations of the colonial forest administration, including the expansion of state territories, scientific extraction of timber, fortification of the bureaucracy by increased training and manpower, and managing all forests through rigid departmental plans.

In fact, local needs and rights remained ignored. The concept of people's participation was still kept aside as before. This policy may be considered as the expansion of British policy, because of the intention to earn more revenue and treat local people in and around forests as the enemy. Ethnic people living in and around forests were anaemically treated in the process of commercialisation of forests as they were before in the colonial regime and therefore people of CHT also affected in the same manner as mentioned.

The Forest Policy, 1962

Policy directives were issued in 1962 vide Government of Pakistan, Ministry of Agriculture and Works, Food and Agriculture Division's letter no F. 4-30 / 62- p4, dated 20 June 1962, which is known as the Forest Policy of Pakistan, 1962. The salient features are: each forest should be made a commercial concern by intensifying forest management. Utilisation of forest products was to be improved in order to reduce rotations and to keep pace with improved harvesting; regeneration should be sped up; government land along roads, canals, railway tracts, and wastelands should be transferred to the Forest Department to increase forest cover by planting; to produce industrial wood for primary raw materials; irrigated plantations should be included in the new colonisation plans; each owner of land was to be compelled to grow a specific number of trees; in Chittagong Hill Tracts and Sundarban forests, timber harvesting should be further accelerated; rights in forests were to be progressively acquired; for river bank afforestation, government land should be taken up immediately and for privately owned land, possibilities of acquisition through special legislation should be examined.

This statement shows that there was little change in the nature of forest management and use compared to the British period. Moreover, forest management was intensified to make it an even greater commercial concern. Thus, the alienation of local people's rights and privileges was intensified. This signifies that the concept of people's participation in forestry practices was beyond consideration. Khan (2002: 12) commented about the Pakistan period in the following manner "The independence of India and the formation of Pakistan in 1947, brought about little change in the nature of forest use and management. The Pakistan period (1947-71) was continuation and outcome of colonial rule, and exhibit similar characteristics. Revenue orientation of forest policies, isolation of Government officers from people, emphasis on maximum economic return from forests, state patronage of forest based industries, maximum exploitation and the expansion of state proprietorship over forests were the main feature of forestry during this period."

Thus, local people's rights and privileges in forests as well as their livelihood needs were ignored during the Pakistan period as they were in the time of British rule. Hence, the *Adivasis* (indigenous people) of CHT were affected in the same way during the Pakistan period also. Being a sovereign independent country, the policy should have resembled one of a welfare state. However, in the then East Pakistan (presently Bangladesh), the concept of national interest was applied in a narrow sense; the local interest contradicts the national interest. This antagonistic attitude in forest policy during the Pakistan period reveals that policies were not formulated by considering the country as a welfare state; more particularly, this is absolutely applicable in the case of East Pakistan (present Bangladesh). In the implementation of forest policy, the national interest remained confined to augmenting revenue earning. The interests of the local people or ecological considerations, whenever they came in the way of generating revenue from forests, were set aside by the government in the name of broader national interests. During this period, forest dwellers were disassociated from management and use of forest produce, as they were in the British period. Thus, the local rights and demands remained ignored as they were in the colonial period, indicating that the Pakistan period was simply an extension of the colonial period only. In other words, after the British period, Bangladesh (the then East Pakistan) fell under another period of colonial rule, and CHT as an *Adivasi*-inhabited region again suffered in the same way as before. The penetration of economically viable outsiders in the forest region CHT, in order to

make quick profits, exploited forest dwellers, and gradually displaced them from their land and ultimately turned many of them into bonded labourers.

The National Forest Policy, 1979

This is the first Forest Policy of independent Bangladesh, based on the outcome of the conference on forestry, held in 1979. In light of the suggestions made in the conference, the National Forest Policy, 1979 was notified in gazette no.1 / For – 1 / 77 / 345, dated 8 July, 1979. The salient features are: All forest land in the country should be carefully preserved and scientifically managed for qualitative improvement; government forests should be designed as national forests and should not be used for non-forestry purposes; by establishing large scale plantations, tree and timber wealth should be increased in order to meet national requirements; optimum extraction of forest produce should be undertaken by employing modern technologies and modern trends of utilisation; forest-based industries should be set up and measures should be taken to meet raw material requirements for the industries; to cater the scientific, technological and administrative need of the forestry sector, research, education and training should be organised; measures should be taken to manage the forestry sector by members of a cadre of officers constituted for that purpose; the forestry sector should be recognised as a separate administrative unit of the government; steps should taken for wildlife management, forest conservation and to utilise the recreational potential of the forestry sector; technical assistance should be extended for those interested in forestry and mass motivation should be initiated.

This policy was “a two page manifesto type statement” with obscure and “generalised direction,” mostly focused on the Forest Department (Anon, undated 5 & 18; cited in Khan, 2002). The policy was somewhat vague and not fully implemented (FAO, 2003: 24). Rural forestry and local people were paid no particular attention, except in the form of a vague call for a “mass motivation drive for tree planting” (Millat-e-Mustafa, 2002: 120). The policy expressed the views of the traditional foresters, overlooking the overall development strategy (Roy, 1987: 45) and was hardly adequate for addressing the current needs and crisis of the forestry sector (Task Force, 1991: 219; cited in Khan, 2002: 13). According to Millat-e-Mustafa (2002), several crucial aspects received little or inadequate attention, including: functional classification and use of forest land, the role of forests as the biological foundation of sustained natural productivity, community participation,

the role of the private sector, processing and utilisation of forest products, the organization of forest-based growth centres, enterprise development, rural energy needs, involvement of voluntary organizations, the importance of non-wood forest products and forestry extension.

Nevertheless, it at least reflected a change, though small, to the traditional colonial industrial approach to forestry. Still, for managing and developing forests, people's participation was not taken into consideration. There was an almost complete lack of any significant provision for rural people's involvement in forestry in pursuing the so-called 'sustained yield' principle (Khan, 2002). Sustained yield is the main obligation of public forest management in Bangladesh (Khan, 1980; Zabala, 1990; also cited in Khan, 2002). Though, in a vague statement, this policy did attempt to narrow the gap in contradictions of previous policies between public and local interests, and as such, it may be considered as lighting the way for the formulation of a policy for a welfare state in the future.

The National Forest Policy, 1994

After the formulation of the National Forest Policy, 1979, initiatives were taken to orient the policies in an appropriate way, as much as possible, to meet the demands of the time. Socio-economic factors related to the depletion of forest resources and associated hindrances in forest management were taken under consideration along with diversified forest management practices. In this regard, the government formulated a 20-year Forestry Master Plan. The suggestions and proposals of the Forestry Master Plan were examined and evaluated in respect to the demands of the time and the amended Forest Policy, in the name of the National Forest Policy, was adopted in 1994. Among the salient features of this policy, notable was the incorporation of the participatory forestry concept and provision of opportunities for co-operation between government and NGOs in a Social Forestry program. Provisions were more clearly made to prevent encroachment, illegal tree felling and hunting of animals through local people's participation.

This policy partially committed to some of the issues which are considered vital for people-oriented forestry. Khan commented that (2002: 14) "as compared to the earlier policies, however, the 1994 policy represents an initial move in the right direction, considering its (albeit partial) commitment to some of the issues which are considered

vital for people oriented forest policy, such as sustainable development, poverty alleviation, local peoples participation in forest protection and government support for forestry development by any quarter.”

Thus, this policy may be considered as a move towards the policy needed for a welfare state. According to Millat-e-Mustafa (2002), examination of the currently active National Forest Policy revealed the following major features: a commitment to sustainable development (meeting the basic needs of present and future generations), the integration of forestry in the broader framework of rural development and poverty alleviation, the participation local people in forest protection, recognition of the importance of women’s participation in land-based production systems and government support and encouragement for all forms of public and private afforestation programmes.

This policy has evolved centrally, and therefore has the chance for modification needed from experiencing challenges during policy implementation in practice. One of the relevant limitations of his policy as stated in Khan (2002: 14) is “(a)lthough it is vaguely commits to extend the scope of poverty alleviation and forest based rural development, it does not say anything about the how it can actually be achieved, given the unfavourable features of Bangladesh society such as the skewed pattern of resource distribution, residual degree of collectivism and rigidly hierarchical social stratification.”

For participatory approach, capacity building of the Forest Department (FD) is required. Blending of scientific integrated forest management with indigenous knowledge and people’s participation is a challenging task for FD personnel. Our research work on ethnic peoples’ participation in forestry practices is valuable according to the above observations.

Unfortunately, the Bangladesh government implemented the policy nationwide and allowed for no different regional interpretations. Therefore, the region of CHT, being quite distinctive in its diverse resources and people, make it a unique area for participatory forestry research, which may help in the formulation of appropriate amendments for future forest policy in Bangladesh and similar regions beyond. Moreover, the Bangladesh Forest Policy has evolved centrally. Empirical research findings from grassroots-level forestry practices by our research efforts may also help in incorporating bottom-up findings and approaches in future forest policy for the country.

Forest Acts, Rules and Regulations

In 1865, based on the rules proposed by the then Chief Commissioner of Burma (now Myanmar), the Forest Act of British India was framed. In 1878, the Indian Forest Act was reformulated. This reformulation was done by consulting other country's legislation and was considered a well written document. This was again revised in 1927, largely to incorporate the policy issues the rulers' desired. In 1989, the amended Forest Act provided more penalties for offences. It also restricted Forest Officials and local Magistrates discretionary power. Initial Forest Acts and all subsequent reformed and amended Forest Acts relied on traditional forest protection. All the strict provisions incorporated in these Acts failed to achieve the desired goal to protect and develop forest resources of the country, paving the way for the concept of Social Forestry came into existence, action and practice. To accommodate Social Forestry, the Act was further amended in the year 2000. The existing rules framed under the Forest Act, 1927 are still in force. The only rule that deals with people are the Forest Transit Rules, that regulate the movement of forest produce from both the government and private sectors. In other words, timber harvested from private land came under this purview.

However, most of the existing rules do not accommodate participation in forestry practices. Under the revised Forest Act, 2000, Social Forestry Rules, 2004 have been framed. In the existing rules, regional diversity was not included. The ultimate result is that the existing forest cover is not only being depleted gradually by illicit felling and encroachment, but in many locations forest land is being converted to agriculture and other land uses.

Although a Community Forestry Project was undertaken in Bangladesh from the early 1980s (which may be regarded as the beginning of participatory forestry intervention), and was followed by some other social forestry projects, the rules and regulations that existed at that time were not in accordance with the requirements of social (participatory) forestry projects. Therefore, the government issued orders and notifications from time to time to overcome barriers and to bridge the legal gaps to accommodate people's participation in forestry. It is mentionable here that in all the nationwide projects, CHT was not included and the orders and notifications were not applicable for CHT. However, in CHT, participation in the form of rehabilitation of nomadic shifting cultivators is in existence. Projects were

formulated now and again and implementation attempted in the three hill districts of CHT uncovering many obstacles. In the Forestry Sector Project, only Bandarban district of CHT was included, and its implementation is still poor due to various complications.

Anyhow, in 2004, Bangladesh's first Social Forestry rule was framed. This rule may be regarded as shedding light on an appropriate direction for participatory forestry practices in the country. It includes intervention from a regional perspective also, but still many barriers to implementation in CHT exist. It may be noted that drafting of a new page of the forestry master plan, reversion of the national forest policy and formulation of protected area and co-management rules are currently in progress.

The Major Forest Types

Bangladesh, the most densely populated country of the world, lies in the north-eastern part of South Asia, between 20.34 and 26.38 north in latitude and between 88.1 and 92.41 east in longitude, with a total population of 150 million in 144,000 square kilometres of land. The country is mainly a flood plain delta formed at the confluences of three major rivers, the Ganges, the Brahmaputra and the Meghna, indicating trans-boundary watershed importance.

Being a sub-tropical monsoon country, the total forest cover is about 17 percent, which includes government managed forests and village homestead forests. Government owned forest area covers 2.19 million hectares, with the remaining 0.27 million hectares being privately controlled homestead forests. Of the government forests, 1.49 million hectares are National Forests under the control of the Forest Department and the remaining 0.80 million hectares are under the control of District administrations. Out of the government forests, more than 90 percent are located in the 12 districts in the eastern and south-eastern regions of the country, indicating an uneven distribution of forest resources. The natural forests of Bangladesh are classified into three categories:

1. Hill Forests, which are actually tropical evergreen and semi-evergreen forests, in Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet.
2. *Sal* Forests, which are moist/dry deciduous forests in the central and north western regions.
3. Tidal Mangrove Forests, along the coast of Bay of Bengal.

Hill Forests

These forests are a mixture of tropical evergreen and semi-evergreen and deciduous forests located in the mountainous tracts of the Chittagong Hill Tracts, greater Chittagong and greater Sylhet. These forests are closed multi-storeyed high forests with trees of diameter of up to 1.5 metres and height varying from 30 to 60 metres (FAO, 2000). They cover about 27 percent of the country's total forest land, and form an association of about 400 tree species intermingled, with bamboo scattered or in patches. Among the tall canopy woody species are Gargan, Chapalish, Champa, Civit, Telsur, Gamar, Dhakijam, Teak and Toon. Gargan is the dominant one. About one quarter of the forests, low-yielding heterogeneous forests, are converted into artificially planted forests with high yielding exotic and indigenous species. Bamboo, mainly Muli (*Melocanna bambusoides*), occurs as undergrowth along with cane and evergreen herbs and shrubs. Other bamboo of commercial importance are Mitenga (*Bambusa tulda*), Dallo (*Teinostachyum dolloa*) and Orah (*Dendrocalamous longispathus*).

A lack of timely policy adaptation and management measures to cope with the increased demand for timber and fuel wood and prevailing socio-economic conditions of the country, mean the deforestation rate is continuously increasing. Although these forests are categorised in public documents as closed multi-storeyed high forests, large areas have been degraded due mainly to such illegal commercial logging (especially on steep slopes), organised encroachment and conversion of forest land for agriculture and homestead uses, and attack of *gamar* and teak by *lorenthus* (Khan, 2002).

Inland Sal Forests

These moist deciduous forests cover relatively small areas distributed over the inland plains. These forests are mainly distributed in Dhaka, Mymensingh, Tangail, with the rest scattered in the northern area of the country. They are predominantly composed of *Sal* (*Shorea robusta*) occurring in pure patches, sometimes associated with *Albigia* species and *Carea arbrea* in the canopy and lower story respectively. They have been subjected to considerable cutting and encroachment due to their location in densely populated areas (FAO, 2000)

Tidal Mangrove Forests

These forests, known as coastal forests, are located in the districts of Khulna, Patuakhali, Bhola, Noakhali, Lokhipur, Feni and Chittagong.

Among them, the Sundarban in Khulna is the largest mangrove forest in the world. The rest are mostly planted forests, mainly of Keora (*Sonneratia apetala*) and Baen (*Avicennia officinalis*). The Sundarban forms a closed forest with a dense canopy, with predominant tree species being Sundari (*Heritiera minor*) and Gewa (*Excoecaria agallocha*), and less frequent species Keora (*Sonneratia apetala*), Kankra (*Bruquiera gymnorrhiza*), Baen (*Avicennia officinalis*) and Goran (*Ceriops roxburghii*).

Forest Cover and Status

The forests on state land have been subjected to organised illicit commercial logging, unplanned and abrupt conversion to agriculture and other non-forestry uses, fire, grazing, and other anthropogenic influences (Khan, 2002: 6). Out of 70 percent of the disturbed area of the country, almost 60 percent of the hill forest is heavily or moderately disturbed (FAO, 2007: 57). Forest land constitutes 18 percent of the total area of the country, and the actual forest cover is alarmingly less. Per capita forest land is approximately 0.02 hectares. Timber, bamboo and cane are the major forest products. Almost everywhere, bamboo and indigenous tree species grow. Although village forests are the major source for mitigating local timber demands, quality wood is produced from public forests. In public forests, plantation forestry has been practiced widely since 100 years back. Large areas in the hills, plains and along the coast have been planted.

The Forest Department, under the Ministry of Environment and Forests, manages government forests. The Forest Department manages forests on the basis of policies, procedures and methodologies, which reflects a custodial forestry approach resulting in the present degraded situation. However, the government, in its determination to expand and conserve natural forests, has largely recognised the need to develop a policy and planning framework, including appropriate institutional reforms to promote people's involvement in forest management and conservation (Khan, 2002).

The present population is 150 million. Recent annual population growth is 1.7 percent and the density of population is 1,000 people per square kilometre. The gender ratio is 106 males to every 100 females. Bangladeshis have settled in 59,990 villages of 19.4 million households. In the hilly regions, about one million ethnic people live with diverse cultures and beliefs. The ever increasing population of Bangladesh is exerting pressure on existing forests for more food, fuel

wood, timber, fodder and other forest products and is resulting in the over exploitation of government managed forest resources (Khan, 2002). Other forest lands, such as village homestead forests, are also degraded due to over exploitation. The annual rate of deforestation is reported to be 8,000 hectares or 3.3 percent and is considered higher than in other South Asian countries (Gain, 1998). Population pressure associated with other socio-economic and management aspects, policy matters, and local wealthy and influential individuals' personal activities are also blamed.

Between 1991 and 1998, the Forest Department established forest plantations on about 149,000 hectares of land. Strip plantation, raised along roads, connected roads, and railways amounts to about 23,800 kilometres. To attain sustainability of forest resources, the suggested annual planting target is 21,000 hectares. During 2003 to 2012, it is estimated this should be enhanced 17 percent higher (FMP, 1993). Industrial plantations, totalling about 70,000 hectares, exist in the CHT, Cox's Bazar and Sylhet districts (FAO, 2000). The Bangladesh Forest Department has a long experience in activities to establish successful plantations, but the major failure of the department is its ineffective protection of plantation resources from illicit felling, encroachment, etc. Present inventories and estimates generally note that 20 to 30 percent of all plantations established during the last 30 years no longer exist (FAO, 2000). According to the Sustainable Development Networking Program (SDNP) of UNDP, Bangladesh is overwhelmingly endowed with environment and natural resources, but the economic and social forces at work coupled with other natural and technical factors, may have already seriously eroded the natural resource base of the country, which could have serious adverse impacts on output, income and employment.

The consumption of forest produce in the country is perhaps the lowest in the world. In 1984, per capita consumption of fuel wood and timber was only 0.08 m³ and 0.008 m³ respectively (FAO, 1986). Although, even if the consumption levels remained the same, the projected supply would only be able to satisfy 26 percent of fuel wood and 41 percent of timber needs in the year 1995 and 20 percent of the projected demands for fuel wood and 33 percent of timber by the year 2000 (Davidson, 1984). The wood produced in the country is consumed domestically. Due to overexploitation of public forests, the government imposed harvesting restrictions; therefore, production from government forests declined, leading to increased pressure on village wood groves. Village forests supply 50 percent of the timber

and 65 percent of the fuel wood consumed in the country (FAO, 2003). Increased demands for wood associated with an ever increasing population created a serious shortage, resulting in gradually decreasing consumption. In 1993, the Forestry Master Plan stated that the per capita consumption of wood and fuel wood is 0.01 m³ and 0.05 m³ respectively. This is a clear indication of the gradual decrease of forest cover in the country. The rate of forest resource depletion is much faster than those of the contemporary attempts in afforestation and rehabilitation of denuded resources (Khan, 2002).

Moreover, the spatial distribution of public forests in the country is completely uneven. 24 districts have no government forest land. About 50 percent of the public forests are located on the eastern hill regions, out of which a major portion are either inaccessible, unutilised, or under utilised. 0.12 million hectares of Plain land *Sal* forests are forests in the vast flat countryside where population pressure is enormous. The rests are mangrove forests along the coast of Bay of Bengal on the south-eastern corner of the country.

The CHT People

Peoples' participation in forestry development is now an acceptable strategy in Bangladesh. Accordingly, in the areas where ethnic communities are the inhabitants, the involvement of ethnic communities in participatory forestry programmes are increasingly emphasised as a tool for effective forestry development. Additionally, foreign donor agencies support the local people for community participation in development programmes as a policy measure as well. Policy planners of the government, non-government organizations (NGOs), and donor agencies have significantly accounted for the need of including CHT's ethnic communities in the planning and execution stages of development projects designed for the forest areas where the ethnic communities are the inhabitants. It is necessary to understand which communities are living there, under what social and economic state they are living, their livelihood characteristics, what kind of intra- or inter-relations exist among them, how they communicate amongst themselves in the system and the surroundings where they live, etc. Accordingly, this part of this chapter deals with the above understanding of the ethnic communities' concerned. As this research study deals with participatory forestry practices of selected ethnic communities in Bangladesh, we must know about the ethnic groups of the country in general and the selected Chakma, Marma and the Tripura communities in particular, so that their nature, culture and indigenous knowledge and practices, livelihood and survival

characteristics can effectively be incorporated in formulation, execution and evaluation of participatory forestry projects and programmes.

Ethnic Communities

By “ethnic communities” or “ethnic groups” a reference has been made to those people whose linguistic and/or cultural background is different from the linguistic and cultural background of the mainstream people of Bangladesh (Khaleque, 1998: 2). In our country, since the old days, ethnic communities have often been referred to as ‘tribes’ or ‘tribal groups’ in official documents. The term ‘*Adivasi*’ or ‘Indigenous People’ is also used to mean ethnic people.

According to the population census of 1991, there are 29 ethnic communities in Bangladesh. The main books from where information on ethnic communities and their socio-cultural life have been narrated are: Smart (1866), Lewin (1869; 1870; 1873), Dalton (1872), Hunter (1876), Riebeck (1885), Risley (1891), Gait (1895), Hutchinson (1906), Gurdon (1907), Hodson (1908) and Playfair (1909). These were the main sources of ethnographic accounts in the late 1800s and early 1900s, and still form the major sources of information on the forest-dwelling communities in the country.

Other good sources are the district Gazettes and Census reports during the British colonial rule and the book *Pakistaner Upajati* (1963) published during the Pakistani period. Levi-Strauss (1952), Bernot (1957; 1958; 1964), Bessaiget (1958; 1960), Kauffman (1962), Sopher (1963; 1964) and Brauns (1973), are other sources of information that were based on field visits by foreign anthropologists, mostly to CHT. Among the books, May (1978), Montu (1980), Islam (1981), Zaman (1982), Qureshi (1984) Jahangir (1984), Bertocci (1984), Khaleque (1987; 1992), Rahman (1985), Schendel, et al. (2000), Gain (2000), Brauns and Loffler (1990), Rahman (2000) and Khan et al. (2002), are worth mentioning. The journal *Earth Touch*, an occasional magazine, and the other publications of SHED in the form of books and journals are also important sources of information.

Ethnic Origin

All the ethnic groups in CHT have Mongoloid features. In other parts of the country, the Garos in Mymensingh, Jamalpur and Tangail and the Khasias in Sylhet also have Mongoloid characteristics. Among the other ethnic groups, a few are Dravidian races and the majority have a mixture of Mongoloid and Dravidian races of varied intensity.

This indicates that their original home was not in Bangladesh and they migrated to different places of Bangladesh over time. It is thought that the original home of most of the ethnic communities was somewhere else other than the area that now constitutes the territory of Bangladesh (Khaleque, 1998: 15). Accordingly, the ethnic communities of our present research study area, CHT, have arrived in their present habitat through migration. Anthropologists believe that they all migrated from Myanmar, India and China. The Chakma and the Marma, along with many other communities of CHT, came from Arakan, a region of our neighbouring country Myanmar. The Tripura community have migrated from the Tipperad hills of India. There are Tibetan communities also who drifted down to Asam of India and then came to different parts of Bangladesh, such as the Garo, Khasi and Monipuri. Rahman (2000), in his book *Research Work on CHT* (in Bengali) stated that according to anthropological address, our selected communities for this study, the Chakma, the Marma and the Tripura have 4, 4, and 3 community groups, respectively, though they all originated from Mongolian society. The four Chakma groups are Chakma, Chak (or Sek or Thek), Thainak and Tanchangya. The four Marma groups are Mog, Marma, Rohinga and Rakhain. The three Tripura groups are Tipra, Riang and Usui. The differences in groups are based on some specific cultural differences, though they live in harmony within villages in the same or nearby places.

Group identification features

Diversity in culture, language, religion and social organization may be regarded as the main features of identification among different ethnic communities. It appears that in CHT, the ethnic groups are culturally diverse in terms of religion, language and social organization (Ahamed 2002:21). Larger groups such as the Chakma, the Marma, the Tripura, who generally live in the low hills and valleys, have community chiefs, as well as many kinship and marriage rules. Smaller groups, who generally prefer to live in the high hills, have no recognised community chiefs or hierarchy and live in an ancephalous kind of system. Smaller groups are politically dominated by the larger groups. For material advantage, smaller groups, due to being politically dominated by the larger groups, join the larger groups, but do not sacrifice their separate entity. Anthropologists such as Levi-Strauss (1952), Bessaignet (1958), Bernot (1964) and Kauffman (1962) conducted studies on diverse features of the people of CHT,

encompassing their social organizations, economy based on *jhum* cultivation, oral traditions, ethnographic descriptions and identification of tribes in terms of their location, number, languages, etc., especially of the Chakma and the Marma communities.

In CHT, ethnic diversity is found in close proximity. Within one or the same *mouza* (administrative unit of revenue extraction comprising several villages) in CHT, one may find four groups speaking completely different languages, building different types of houses, wearing different clothes and believing in different customs and religions (Brauns and Loffler, 1990: 36). This indicates that different micro-level social settings exist even in small unit areas of CHT, like villages and/or *mouza*.

Socio-political organizations of different ethnic groups are not homogeneous. According to May (1981a; 1981b), this difference in the internal dynamics of ethnic groups in CHT is more clearly seen if comparison is drawn between valley and mountain groups. In respect to socio-political organizations, Ahamed (2002: 17), noted that valley-dwelling groups, such as the Chakma and the Marma have quite distinct local organizational settings compare to those of mountain-dwelling groups, such as Bawn, Mru and Khumi. He observed that mountain groups totally lack any territorial form of organization, while the indigenous structure of the Chakma and the Marma kinship groups were influenced by the political order of the colonial and neighbouring societies. Larger ethnic groups are divided into many kin groups (clans) and lineages. As stated by Dewan (1990), all the ethnic groups in CHT show well developed patrilineal descent ideologies, coupled with principles of internal genealogical ranking expressed in inheritance and succession. For the Chakma, inter-marriage within kin groups is allowed and marriage is patrilocal. In the Marma communities, clan exogamy with both patrilocal and matrilineal residence patterns exists. According to Selina (1995), though monogamy is said to be a normal rule, the powerful people of the Marma community have more wives, which is an indication of polygenic implications of power and prestige.

As stated earlier, there are differences in socio-political organization between the larger and the smaller ethnic groups. For the linkage between the larger groups and the smaller groups, clanship and lineage, associated with political and material advantages may be regarded as the vehicles. Again, in understanding the relationship between marriage systems and lineage, in the context of CHT local politics and

land ownership, it is imperative to focus on the interactions taking place vis-a-vis resource related issues, such as property rights and land use (Ahamed, 2002: 22). In practice, forest lands are transferred through lineage and clans. Local resource controls and resource use are based on the way groups are locally mobilised. This is an indication of the importance of local organizational activities in relation to resource generation and use, which is a vital issue in Participatory Forestry.

The CHT Case in Particular

Two distinct geographical areas exist in south-eastern Bangladesh: 1) Plain lands along the Bay of Bengal, and 2) Eastern mountainous zone of the country known as the Chittagong Hill Tracts (CHT). CHT is Bangladesh's only mountain or hill area. As one travels to the east, the foothills soon give way to peaks of up to 900 meters (Schendel, et al, 2000: 1). The topography is such that hill elevation gradually increases from west to east. This small mountainous region of the country has a rich diversity in ethnic population; 12 ethnic communities are the inhabitants. Some are accustomed to low hill habitation and others, though small in population size, are acquainted with the high elevated area and have adapted the lifestyle therein. A striking feature is that, as the landscape is dramatically different from the plain, the ethnic inhabitants are also significantly different from the inhabitants of plains, whether living in foothills or low hills and high hills. In Brauns and Loffler's experience in Bangladesh, there was a striking difference in culture between the plain people of Causasoid race (speaking an Indo-European language) and the hill people of Mongoloid race (speaking Sino-languages) (1990: 25-40). As mentioned earlier, the indigenous communities exhibit diversity in lifestyles also.

In Participatory Forestry, an understanding of the nature and livelihood characteristics of the participating people is a necessity for dealing with the advantages and disadvantages of people's participation. Again, our research study is concentrated on the participatory forestry practices which are mainly practiced in the low hill areas by the inhabitants of low hill living communities, predominantly the Chakma, the Marma, the Tripura; therefore, this part of the Chapter deals with the people and livelihood characteristics of the Chakma, Marma And Tripura communities.

Population

According to a 1991 census, among the twelve ethnic groups in CHT, the Chakma is the largest, followed by the Marma and then, the Tripura (also cited in tabular form as shown below)

Table 2.3: Ethnic Population by Race in CHT, as in the 1991 Census Report

Race	Rangamati	Khagrachari	Bandarban	Total
Bom/Bowm	549	00	6,429	6,978
Chak	319	00	1,681	2,000
Chakma	157,385	77,869	4,163	239,417
Khumi	91	00	1,150	1,241
Khyang	525	00	1,425	1,950
Lushai	436	00	226	662
Marma	40,868	42,178	59,288	142,334
Mro/Mru	126	00	00	126
Murang	38	40	21,963	22,041
Pankhua/Pankho	3,128	00	99	3,227
Rakhain	70	00	00	70
Tanchangya	13,718	00	5,493	19,211
Tripura	5,865	47,077	8,187	61,129
Others	174	102+	229	758
		Santals 253		
Total	223,292	167,519	110,333	501,144

Source: Gain, 2000: 9

The Chakmas are mainly concentrated in Rangamati and a part of Khagrachari. Tripuras are mainly concentrated in Khagrachari. The Marmas are almost evenly distributed across the three hill districts. According to Schendel, et. al. (2000), the pattern of human settlement throughout CHT reveals that certain ethnicities are concentrated in specific areas, e. g. the Chakma in the centre, Marma in the tract between the Karnafulli and Sangu rivers, the Tripura in the north and the Mru in the south.

Smaller ethnic communities are mainly concentrated in Bandarban district. The ethnic community of Tanchangya claims themselves as a part of the Chakma - although they culturally show some differences. In the population census of 1991, it is estimated, as per and in our study, that Tanchangyas are also counted in the community of Chakma. According to Rahman (2000), Tanchangyas are a large group of Chakma society.

There was increasing trend of population increase in CHT found in the different census (Table 2.4). Table 2.4 shows that the rapid increase in population occurred in recent decades. According to a census of

UNICEF (1998), the population was found to still be increasing in the same way.

Table 2.4: Decade-wise Population and Variation in Chittagong Hill Tracts from 1892 – 1991

Year	1892	1901	1911	1921	1931	1941	1951	1961	1974	1981	1991
Population	107286	124762	153830	173243	212922	247053	217188	298657	391773	580218	974445
Increase per Decade	---	17476	29068	19413	39679	34131	---	81468	94585	188445	394227
%Increase per Decade	---	16.28	23.3	12.6	22.9	16.0	---	37.51	31.67	48.10	67.94

Source: Bangladesh Population Census of 1981 (District: CHT) and 1991 (Zillas: Khagrachari, Rangamati, Bandarban); Chittagong Hill Tracts Development Project (ADB), 1978, Annex-3:3; Cited in Gain (2000: 8).

Sopher (1964) observed the geographical distribution of ethnic communities in CHT in terms of their settlement pattern. Chakma, Marma and Tripura, who are largely associated with low hills and valleys, are termed as valley groups. Others, who prefer to live in comparatively high hill areas, are termed as mountain groups. In this respect, the selected communities for this research study are valley groups

Religions of the CHT People

Both the Universalistic and Community religions are followed in CHT. Examples of universalistic religions are Buddhism, Hinduism and Christianity. According to Schendel, et al. (2000: 149), ethnic communities belong to the type of religions in CHT that are characterised by teachings recorded in sacred books, a desire to know God, and thereby transcend an unsatisfactory world with the possibility for outsiders to join by way of conversion. Such communities include Chakmas and Marmas, who are mainly Buddhist and Tripuras, who are mainly Hindu (Schendel, et al 2000: 6). In the passage of time, some hill people were converted to Christianity, such as the Mizo, Bawn, Pangkhua and Khyeng (Schendel, et al 2000: 6). On the other hand, there are community religions, that is, the religious traditions which focus upon maintaining harmony amongst the spirit, human, animal, plant and mineral world to which we all inescapably belong. These are the belief systems of the Bawn, Pangkhua, Mizo, Murong and Khumi.

First coming from the Bengal plains and later from Arakan and Burma (now Myanmar), Buddhism once spread over this hill region as the universal religion, though the ancient religion Hinduism also continued its existence. Accordingly, in the course of time, the

Chakma, Marma, Tanchayanga, Sak and Khayeng came to identify themselves as Buddhist and many Tripura considered themselves Hindus. Christianity spread among followers of community religions (Schendel, et al. 2000: 158). The Chakma and the Marma are Buddhists and the Tripuras are Hindus with some Christians (Gain, 2000: 5). The Marma, Chakma and Tanchayangya are Buddhists and there are a few Buddhists among the other small ethnic groups of CHT. Most people among the smaller ethnic communities of the interior part of CHT are animists. Some of the animists have been converted to Christianity by Christian missionaries working in the area (Khaleque, 1998: 1-26).

From personal communication with the staff and officials of participatory forestry agencies, as well as going through the official records and registers, it was found that most low hill-dwelling communities (i.e. the Chakma, Marma and Tripura) are participating, though the Bawn and Murong were also found to be participating on a comparatively small scale, particularly in Bandarban district. Accordingly, in respect to the religions of the participating communities, as the Chakma, Marma and Tripura are our target communities, the universalistic religions of Buddhism and Hinduism were the religions found to be most widely practiced among the selected participants for this research study.

Ethnicity, Cultivation and Economy

All the ethnic communities are traditionally swidden cultivators (called *Jhum* in Bangladesh). According to Roy (2003: 35); the high hill dwellers, the Chak, Khyang, Khumi and Mru (Murong), who live mostly on the ridge tops, are largely Sweden cultivators. The Chakma, Tanchayanga and Tripura who live on the gentle slopes and river valleys, engage in both swidden cultivation and in plough agriculture, although the Chakmas are also involved in market-oriented tree farming and horticulture. Again, mountain dwellers, particularly the high hill dwellers, are engaged in Sweden cultivation and some of them, such as the Bawn, Lushai and Rankhua, are also engaged in market-oriented fruit farming, yet they do not practice plough agriculture.

Integration of the economy of CHT to the market economy of the nearby plains of Chittagong still continues to spread today. More and more CHT people are engaged in services and business. Involvement in business is still very negligible and is largely restricted to the

Chakma, Marma and Tripura communities who together make up more than eighty percent of the indigenous population of the region (Roy, 2003: 36).

Above all, the CHT economy is almost entirely dependent on land. Land being the basic feature, economic production consists of five predominant subsistence activities: agriculture (rice), animal husbandry, fruit tree cultivation, timber and bamboo extraction for household consumption and horticulture (Gain, 2000: 13). Due to a lower population and greater availability of land resources in the old days, there was almost no competition in *jhum* cultivation. The traditional agricultural economy represented a reasonably harmonious adjustment to the environmental and social condition ADB (1978b: 1); also cited in Gain, 2000: 13).

The formation of Reserved Forests in 1928 and the construction of a hydro-electric dam in 1963 reduced the land availability for slash and burn cultivation. Moreover, the rapid increase of population, both the ethnic population and Bengali population, and increased settlement in the hills, further shrank the land availability for *jhum* cultivation. With the shrinkage of land available for *jhuming* by the landless shifting cultivators, rehabilitation of *jhumias* by providing them settlement and encouraging improved farming practices is inevitable. Participatory forestry projects for *jhumia* settlements and poor ethnic people conducted so far by the government targeted the landless, whilst those of NGO agencies focussed on medium land holders. Records and relevant publications and in this context by GO and NGO agencies showed that, in the passage of time, they tried to promote different technological and management practices, in order to improve the economy of the local indigenous people in general, and the settled farmers in particular. Government initiatives were based on settlement on USF land and NGO initiatives were mainly on unutilised medium land holdings or under utilised land available for forestry practices.

Gain (2000) also quoted that big land owners, peasants and landless cultivators are the three classes into which the rural CHT population can be divided in the context of land-based economic activities. The peasants are flat land producers and the landless cultivators are those who practice slash and burn cultivation on the hills. Peasants and landless cultivators mostly do day labouring, though some are also engaged in small business also. The ethnic people have limited access to services, jobs and business. About 90 percent of ethnic women are directly engaged in agricultural activities (Gain, 2000).

CHT people's main dependency is on the land-based economy. According to BBS, land owners are classified into three categories, small, medium and large, depending on the size of their land holdings. The Census for Agriculture, 1996 defines that 0.05 to 2.49 acres, 2.50 to 7.49 acres and 7.50 acres and above, represent small, medium and large holdings respectively.

This study deals with poverty reduction and the associated process of settlement of poor shifting cultivators by providing land for settlement and involving them in forestry and agro-forestry farming practices in an attempt to reduce the intensity of environmentally unfriendly shifting cultivation in the USF land of CHT. Therefore, getting an idea about the traditional shifting cultivation (which is locally known as *jhum*) and the introduced improved land use practices is worthwhile.

Traditional Agricultural Practices: Jhuming

Jhuming is a century-old agricultural practice for growing agricultural crops in CHT. *Jhum* cultivation is rain-fed farming method practiced in the hill slopes in CHT by the indigenous people (Mohiuddin, 2006: 51). It was a traditional cultivation system without land tenure on the cultivated land (Rahman, 2000: 46). It was the foundation of the economic structure and the main source of livelihood in CHT. In the Mughal period there was a temporary *jhum* leasing system which was continued during the British period also. Before 1900, there were no formal rules or regulations regarding *jhum* cultivation, *jhum* leasing or *jhum* administration. Articles 34, 35, 36, 37, 38, 39, 40, 41, 42, 48, of CHT regulation no. 1 of 1900, cover *jhum* and *jhum*-related traditional administrative systems and their application in the field. Up to the 1960s, apart from the small number of farmers who were fortunate enough to own plough lands or fringe-lands, by far the majority of CHT farmers were engaged in *jhuming* (Gain, 2000: 91).

Jhum land or the hilly USF land where shifting cultivation is practiced is generally owned by the village community rather than an individual. Headmen distribute *jhum* land to the *jhumias*, who occupy land first and then register with the headman on the basis of family size or community size. It is mentionable here that the state is the owner of all CHT land (CHT Manual, in CHT District Gazetteer) and *jhumias* are allowed only to cultivate the *jhum* land for their livelihood on the condition that they pay tax to the headman, which is to be shared by the headman, the chiefs and the government.

Jhum is carried out predominantly on the steep slopes of the high hills (Gain, 2006: 82). Fertile land is selected for *jhuming* in the months of January and February and then trees and vegetation on that land are cut and dried in the sun. Then in the month of April/May, before rainfall begins, thoroughly dried, cut bushes and vegetation cover are reduced to ashes by burning. The ground is then cleared of debris caused by burning. In this way, site preparation is completed and the *jhumias* wait for rain. Sowing commences as soon as rainfall saturates the ground. Mixed seeds of different crops, having different ripening times, such as rice, cotton, melon, pumpkin, millet, beans, gourds, yam, maize, oil seed, ginger, sesame, etc., are planted in small holes at almost even intervals. Banana is planted for harvesting the next year. The young plants need constant weeding and guarding from biotic and abiotic interference. It is the men who usually cut *jhum* for the whole village while the women and children are generally do the weeding, tending etc. Weeding and/or other different management practices are followed based on traditional knowledge (Mohiuddin, 2006: 52). This century-old farming practice has provided a strong base for indigenous knowledge of hill cultivation.

The main limitation of *jhum* cultivation is that a *jhum* plot can be cultivated only two to three years in continuity and the degraded land should be kept out of cultivation for at least 10 years to recover the loss of land fertility. In the old days, population pressure was not significant with the availability of land for *jhuming*. However, in the course of time, due to an increase in population as well as land demarcated for other uses, the availability of USF land for ecologically feasible *jhuming*, allowing sufficient time to restore the land's fertility sufficiently for re-*jhuming* has decreased in an alarming manner. Today, the two to three year fallow period for *jhuming* has become difficult to maintain. According to Millat-e Mustafa, et al. (2002: 67), until the early sixties, land use in CHT was considered appropriate for the hill ecology. *Jhum* land was available in abundance for cultivation, which the farmers, before shifting to a new site for *jhuming*, would manage for a period of 3 to 4 years. Land use is characterised by a constantly changing people-land relationship balance (Devis, 1976), and to maintain this balance, the people-land relationship modified *jhum* cultivation, and other land use systems emerged.

Since the fallow period for *jhuming* has reduced to a point to permit good re-growth and natural vegetation, *jhum* has become a harmful practice. Soil, land and vegetation surveys conducted by different agencies since 1960 have described *jhum* practice as harmful and

halting measures were suggested. Shifting cultivation is practiced under various common property regimes, and the practice is discouraged altogether, although allowed in USF (WOCAT, 2006: 5). These surveys implied the introduction of several land use practices in CHT with the ultimate intention to halt *jhuming* by introducing settled farming practices. These are mainly forestry and agro-forestry farming practices in different manifestations.

A farming system is an integral part of any land use system. Land use system generally means the way in which land is used by a particular group of people within a specified area (Khan, et al, 2002: 2). A farming system is a unique and reasonably stable arrangement of farming enterprises that the household manages according to well defined practices in response to the physical, biological, and socio-economic environment and in accordance with the household's goals, preferences and resources (Shaner, et al., 1982; cited in Khan, et al., 2002: 2). As more than three quarters of CHT land is suitable for forestry, one quarter of the land, particularly the comparatively higher lands, were taken under direct government control as reserved and protected forests. The remaining area suitable for forestry was demarcated as forest land under the name Unclassified State Forests (USF) where traditional *jhuming* rights were granted, though this practice was discouraged by the introduction of new projects in an attempt to gradually reduce the ecologically unfriendly *jhum* cultivation.

The government forest includes both natural forests and plantations. Small pockets of forestry plantations of private ownership are also seen. The government forests include both natural tropical forests and single species plantations of teak or rubber along with other expensive varieties, while the private forests usually have single species teak or *gamar* plantations and mixed species plantations (Roy, 1998: 100). According to WOCAT (2006: 6), the dominant forest types in CHT are mixed evergreen and deciduous with relics of the five major forest ecological sub-types: 1) Tropical wet evergreen forests that cover the valleys; 2) Tropical semi-evergreen forests covering the lower story and deciduous forests covering the upper story; 3) Tropical moist deciduous forests occurring in channel banks; 4) Tropical open deciduous species occurring on the exposed southern slopes; 5) Bamboo forests either in pure patches or as undergrowth. Different bamboo species occupy the ecologically different land types extending from the channel bank to the hill tops. Much of the USF land is now covered by various types of fallow vegetation including bamboo

thickets, bushes and low forest of non-commercial shrubs, and some with monoculture forest plantations. Our main concern is the land use in USF land and privately-owned land where *jhum* cultivation is generally practiced. In these areas, in the course of time several land use types emerged, but all of them mainly fall under the heading agro-forestry in different manifestations or sub-types, with different farming practices for agricultural production as mentioned earlier.

Languages

Many ethnic communities in Bangladesh are often bilingual, except for a few communities living in the remote and interior parts (high hill area) of CHT. Though they have their own languages, they also learn the Bengali language for communicating with their Bengali neighbours. Some ethnic people, particularly those who have converted to Christianity, also learn English

Khaleque (1998: 15) stated that the original languages of the different ethnic groups belong to the various branches of different language families. Original written script was absent in all cases of ethnic languages. Many of these people have adopted other's scripts to write their own languages, such as, Bengali by the Tripura and Burmese by the Chakma and Marma.

As the targeted communities for this research study are the Chakma, Marma and Tripura, it was an advantage to understand their dialect or conversation they used, in noting the points during questionnaire interviews and group discussions.

Conclusions

In ancient times, while a part of India, Bangladesh was covered with dense forests. Gradually, natural changes occurred in the tree species and ultimately survived species formed climax forests. Ancient people used to depend on forests fully, but did not do them much harm. By physical strength they merely uprooted small trees or tore off small branches which had almost no impact on the climax forest vegetation due to the gigantic scale of regeneration. After the migration of the Aryans to India during 2000 to 1000 BC, people started cutting trees for building houses, etc. The Aryans were mainly agriculturists and pastoralists; therefore, forest clearing for agriculture began. Still, due to the low population, the impact on vegetation was insignificant. In the passage of time, the population increased and the demand on forest produce also increased manifold, ultimately resulting in more advanced methods for destroying climax vegetation. When the anticlimax of Indian forests occurred is unknown. History tells us that climax

vegetation existed in full around 1500 BC, as evidenced by the writings of the *Vedas*. Information on ancient forests was also found from the *Ramayana* and the *Mohabharat*. From the *Purans* (ancient stories), religious and the spiritual beliefs about forests and the use of forest produce based on those beliefs are evidenced.

During the whole pre-commercial period, forests mostly remained communal property. People had rights and privileges over forests without individual stake. This is true up until the Maurya and Gupta periods, and often in the Muslim period up until the Mughal regime, except for the introduction of conservation for imperial hunting, and recreation in some cases. Thus, the succession stages of forests in those periods were progressive due to very insignificant harmful destruction of forests. Forests were controlled and managed by the local communities in a sustainable manner almost without influence from the ruler's side. Forests for the ethnic people in particular were managed symbiotically for their livelihood. At that time, a kind of localised community level participatory forest resources management was in existence without any hindrance from the rulers, which may be regarded as oriented and processed in an environment that lead to positive succession of forest species in general, and ethnic inhabited forest in particular. Through their extensive practice, indigenous knowledge and technologies, they achieved forest conservation for their existence.

During the British colonial period, importance was placed upon the commercial value of forests. The commercial processes gradually alienated local people from the use and management of neighbouring forests. The British forest policies, which were based on revenue earning and commercial needs, altered the interdependence between man and nature. The process of indigenous cultural and economic disintegration began with business-based foreign intervention by the European people. The process was started and continued by creation of reservations and state appropriation of local forests for revenue and commercial exploitation, largely ignoring local people's needs. The Forest Department was created with the same motto in order to execute the commercialisation process and ignite penetration into the local economy and forest by expatriate commercial forces and their local associates. These commercial forces changed the philosophy of forest management and caused public alienation of local people by way of gradually decreasing their forest rights. This situation put local people in competition for forest resources, and many of them were displaced from their habitats. The ultimate result was the introduction of illegal felling and over exploitation of forest resources. The previously

mentioned positive succession of forests turned toward negative or regressive succession.

During the Pakistan period, a similar policy was imposed and executed in full vigour. Heavy commercial exploitation and unsustainable destruction of forest occurred. The alienating condition of local people was amplified. Continuation of revenue earning and propping up the commercial economy was the main aim. The ultimate result was hastened destruction of forests. Regressive succession of forests gained accelerated momentum.

After the independence of Bangladesh, the government gradually introduced public-oriented forestry activities through five-year plans and policy formulations. The realisation about the degradation of forests, loss of forest areas and covers was brought to the attention of policy makers. The adverse effects of commercialisation of forests and the alienation of local people were taken under consideration in managing and developing forests. Although in earlier stages the commercial value of forests was given priority, gradually the introduction of forestry extension services and adoption of community forestry projects based on policy level initiatives emerged. Thus, the regressive succession stage of Bangladesh forests turned into a progressive one. The government realised the need to introduce people-oriented forestry to manage degraded forest lands for future forestry development in the country. In this way, PF was anchored in Bangladesh forests and with time manifested in scientific, technical and social forms. The Forest Policy, 1994 was a milestone for PF intervention in the country, leading PF legislation to be formulated and implemented.

Land is the base to support natural resources. The characteristic of natural resources that is supported by a particular land depends on its climatic and edaphic factors as well as management measures adopted. All the biophysical characteristics of CHT are suitable for the growth of trees and forests. Again, land uses are controlled by people. The style of land use differs depending on the nature of livelihood and culture of the local community. Due to interventions in land use practices in CHT, the traditional land use (*jhuming*) is now shifting towards more suitable land use practices, particularly in low hill dwelling areas.

In CHT, the ethnic communities have traditionally lived in harmony- irrespective of ethnicity, religion and culture. All the ethnic communities have predominantly been *jhum* cultivators. Their economy depends on land. Their land-based economic production

consists of agriculture, animal husbandry, fruit and timber tree growing and bamboo production. Although in the old days, due to the small human population, traditional *jhuming* was in reasonably harmonious adjustment with the local environment and social conditions, it is now detrimental to the environment as the fallow period has been reduced abnormally. Still, the main dependency of ethnic people is on the land-based economy, indicating the necessity to address land use in light of different potential land-based interventions.

PF practices require knowledge about the existing forests, land use practices by the people in and around forests, and their livelihood strategies including various related economic and social aspects. Shedding light on the issues of people, their surrounding natural environment and means of livelihood, including land and land use practices, is a vital necessity for formulating appropriate strategies for effective involvement of people in participating in progressive forestry management and development. With this end in view, this Chapter elaborated some of these issues, with a focus on CHT people in general. In order to set the context of this study, a general overview of forest destruction in the country, which ultimately pointed out the necessity to introduce PF, as well as related land use practices of CHT people, was briefly provided in this Chapter. In the next Chapter, the nature and advent of PF globally, regionally and from the Bangladesh country perspective is explored, incorporating examples of specific project interventions in CHT.

Chapter 3

The Currency of Participatory Forestry

Introduction

The preceding chapter reviewed the historical evolution of forest management and related policies, rules giving special attention to our study area CHT. Furthermore, it delves into the impacts of PF projects on forest and people based on evaluatory goals of poverty reduction and participation. Remedial measures to shift away from the process of alienation and make provisions for increased intensive participation of local people in forestry development in CHT, in the form of project interventions with the goal to achieve socio-economic upliftment of the participants are also outlined in this chapter and regulations and the impact thereof on forests and people, the lands and land uses, and the ethnic people of Bangladesh with special reference to CHT. The rampant deforestation, which occurred gradually due to alienating policies and activities, attracted the attention of forest policy makers and management experts, forcing them think about how these problems could be addressed in the future. It was realised that without active participation of communities living in and around forests, no programme to regenerate degraded forests would succeed. Based on these realities, since 1980, attempts were made to solve the problems of forest degradation, deforestation and encroachment in Bangladesh via the introduction of Participatory Forestry (PF).

PF in Bangladesh is not a pioneering phenomenon in the global or regional context. Throughout British colonies, forests were controlled and managed mainly for commercial benefit, ignoring people; the ultimate result being the degradation of forests and the wider environment. Since 1970, the crisis of forest degradation worldwide was brought to the attention of global leaders by various international institutions, in particular the Food and Agriculture Organization (FAO), through world forest inventories. Consequently, from the mid-1970s, in line with many forest degraded countries of the world, South Asian countries witnessed a major shift in forest policies and management strategies, and as a result PF concepts, approaches and related strategies emerged. Due to high population, Asia in general, and South Asian countries including Bangladesh in particular, have experienced more intensive PF interventions.

Based on secondary literature, this chapter outlines the general concept and nature of PF, and attempts to review the Bangladesh perspectives of PF, g

Concepts and Nature of PF

Since 1960, the word “participation” has been found in the development vocabulary. Initially, it was usually employed to understand people’s involvement in relation to some specific kinds of problems, and gradually came to be viewed as an integral part of overall development efforts. Global changes have had a major influence on this shift in approach. Increasing democratisation and more open political systems, liberalisation of economic and trading systems, higher levels of education in developing countries and increased human resource capacity, improved communication and information flows, and increasing concern about issues of environment and poverty are worth mentioning. Participation is a means to more effective poverty reduction, a window of opportunity for accelerating social and economic progress (Bhatia, *et al.*, 1998: 65). Hence, appropriate people’s participation is an effective way to achieve development goals. Moreover, people’s participation in development initiatives based on improved knowledge and manpower is an effective means to address poverty reduction though economic, social and environmental development.

Participation is a process of collectively discovering solutions to people’s own problems, performed by the beneficiaries themselves. A study on Social Forestry in Eastern Bhutan (TFDP, 2000) viewed participation in development as the act of being involved—of encouraging, enabling, and involving persons singly or in groups as source users and management committees, as neighbours and community members in making choices and decisions, planning, taking action, controlling and sharing of the benefits.

People’s participation in forestry development is commonly called Participatory Forestry. PF is people-oriented, or people-driven, forestry. The PF concept evolved from the idea that whenever a forest is destroyed and cannot be re-established to the traditional form of management by any means, it can at least be reforested by useful tree crops, and improved, protected and managed by some other means. A group of such management activities that has increasingly come to the fore over the last quarter of the twentieth century are often collected under the umbrella of SF. SF may incorporate a wide variety of tree growing and harvesting practices; the common element among all being participation of rural people in management and benefit sharing

(Asaduzzaman, 1989: 2). The means of naming of the manifestations of PF depends on the emphasis placed on particular characteristics of programmes or actions. The common element is people's participation in management and benefit sharing.

According to Task Force (1987: 1), the term PF is used rather flexibly as an umbrella term for such public, private, and community initiatives which aim to ensure active participation by rural people in planning, implementation, and benefit sharing of tree growing schemes. In Bangladesh, PF initiatives primarily include afforestation programmes in marginal and degraded forest lands and community forest lands, village woodlots, farm forestry, strip plantations alongside railways, highways and embankments, community plantations on public and communal lands with joint management and benefit sharing arrangements between the government and local communities, homestead forestry, and various other manifestations of agro-forestry (Khan, et. al., 2004). Hence, the manifestations of PF vary in outward practice, but their underlying philosophy is effective participation of local communities, alongside protection and development of forest resources, land and the environment.

PF can be employed as a strategy for rural development and poverty reduction. It is viewed within a broader framework of rural development in Bangladesh (Alim, 1988; Khan, 1998a), and displays a clear bias towards socially and economically vulnerable sections of local communities (Khan, *et. al.*, 2004). People living in and around forests are commonly poor and vulnerable, many of them indigenous and/or landless people who have migrated from other areas. According to the criteria for the selection of farmers, as stated in the project documents of different PF projects so far undertaken, the most vulnerable populations are landless farmers, ethnic groups, and rural women. Enabling these people to share in the benefits, as well as contribute to the management of forestry development, helps alleviate their poverty and diversify their income sources (Bhatia, et al. 1998: 69). Thus, empowerment, via promoting social equity through equitable sharing of decisions during projects, and welfare, through ensuring equitable benefits generated from forest resource development, are the two broad values that anchor PF programmes. Therefore, strategies that combine technical afforestation measures with methods for achieving these social values are the driving force behind PF.

In the above context, and also according to the statement quoted in *Concept Paper 1: Concept of Participatory Development* (Bhatia, et al. 1998: 69), "Participatory Forest Management may be regarded as the participation of local communities and other stakeholders in managing forestry projects and can help improve forest productivity, alleviate poverty, increase environmental sustainability and make rules

governing forest access more enforceable.” Therefore, government commitment, and development of consensus among stakeholders, establishment of new institutional arrangements, building organizational capabilities at the local level, appropriate rules and incentives for local involvement, decentralization of finance and administration are the essential requirements for Participatory Management. This needs a shift from the focus on centralized planning and management by government agencies to a more participatory approach (as shown in Table 3.1) that balances social, environmental, and economic objectives.

The views quoted in Table 3.1 signify that PF should result in an improved livelihood and lifestyle of farmers in harmony with nature.

Table 3.1 Comparison of Conventional and Modern Participatory Approaches.

Conventional Approach	Participatory Approach
<i>Executive agency-driven</i>	<i>Participatory, farmer-driven</i>
<i>Target-based</i>	<i>Participatory process-based</i>
<i>Aimed only at soil, water and Forest conservation</i>	<i>Aimed at poverty alleviation and overall human development through natural resource management</i>
<i>Transfer of technology (TOT) extension method</i>	<i>Farmers first approach married to TOT</i>
<i>Extensionist- and scientist-led</i>	<i>Farmer- led</i>
<i>Based on improved technology and ideas</i>	<i>Based on indigenous or improved technology</i>
<i>Top-down planning, monitoring and evaluation (M & E)</i>	<i>associated with local tradition, culture and cosmic vision of the local people/ farmer / land users</i>
<i>Land use based on land capability</i>	<i>Participatory planning, M & E</i>
<i>Did not consider structural issues, e.g., land ownership, farmer’s organization, etc.</i>	<i>Land use based on land productivity</i>
<i>Aimed at long term benefits</i>	<i>Land use titling and farmers organization at forefront of participatory forest management</i>
<i>Empowered the agents of technology transfer, i.e. officials</i>	<i>Aimed at quick net benefit generation (economic, environment, and social as well as political)</i>
<i>Attended to selected generally better-off farmers</i>	<i>Aimed at people’s empowerment</i>
<i>Tended to be taken over by single sectors/ departments</i>	<i>Aimed at marginal, small and poor farmers with especial emphasis on equity between genders and among disadvantaged classes</i>
<i>Incentives and aid used for people’s initiatives, participation</i>	<i>Multi-sectoral and multi-disciplinary</i>
<i>Did not encourage</i>	<i>Investment at the disposal of the farmers</i>
<i>Disjointed and arbitrary</i>	<i>Based on people’s initiative</i>
<i>Large area based</i>	<i>Uses farming system’s approaches as well as common property management approach</i>
	<i>Small area based people’s initiative</i>

Source: Anderson (2000)

In the context of participation analysis, according to Uphoff (1989: 1), Cohen and Uphoff (1980: 219-222) and Uphoff et al. (1979), cited in Khan, 1998a, one major theoretical perspective of participation is to see it as a cycle for rural development activity consisting of participation in decision making, implementation, benefits and evaluation. Zaman (1984), Hye (1991), Task Force (1991), Mango and Ali (n.d.), FMP (1992), Khan and Khan (1993), Khan and Begum (1997) fruitfully used this framework to analyse participation in some major studies on Rural Development and PF activities in Bangladesh. Khan (1994: 343-455) also used the framework suggested by Uphoff, et al. (1979) and Zaman (1984) to analyse participation in PF projects in Bangladesh, Nepal and India.

Vergara et al. (1986), observing the field nature and function of PF practiced in South Asia, noted that on the one hand, the traditional, bureaucratic, top-down model of decision making and implementation, and on the other, farmer-controlled management and operation are the two main operational approaches. He commented that farmer's control usually predominates.

Sen and Das (1987 cited in Khan (1994; 1998a), have noted two alternative sets of tasks in PF, as shown in Table 3.2.

Table 3.2 Two Common Sets of Tasks in Participatory Forestry

Operational Tasks	Management Tasks
Nursery Raising	Selection of Land
Land Protection	Planting and Deciding what to Plant
Watering	Organising Planting Operation
Weeding	Managing the Plantation
Fertilisation	Marketing the Surplus
Protection	
Exploitation	

Source: Khan (1998a); based on Sen and Das (1987).

PF can be broken into two broad classifications: farmer participation and agency participation. In analysing project performance, both sides should be taken into consideration with equal emphasis in order to assess overall levels of participation in PF. Moreover, analysis of the frame, i.e. the system and the surrounding environment of a PF programme undertaken in a particular locality, is a necessity. The success of a particular strategy depends upon the factors that influence the frame. Brokensha and Castro (1984:1) stated that the strategy known as Natural Resource Management cannot logically be considered except in relationship to a specific social setting. A social setting is a complex system of relationships and institutions; the

emphasis is on system, which forces us to consider a wide array of relevant factors. Among such factors, some major variables of special significance to PF are as follows.

Land and Tree Tenure

For forest resource development strategies in South Asia, land and tree tenure are of great significance. Tenure rights largely determine people's access to resources, benefits and power (Khan, 1998a: 98). Land tenure has different dimensions and implications. Riddell (1987: 1-4) observed that people, time and space are the three major dimensions of land rights. Therefore, consideration of tenure arrangements in formulating PF programmes should take into account the dimensional complexity of land and tree tenure. People's interaction and social status depend on land rights, the implication of time in land and tree tenure, and the interaction and competition among different uses and users over a particular space make tenure a complex issue in PF. The consideration of the factors related to the frame, i.e. the system and the surrounding of a particular PF project, is essential.

For building trust of participating farmers in regards to the security of their benefits from PF, long term tenure arrangements have a positive impact due to the fact that forestry involves a comparatively long gestation time. Shepherd (1990: 2) observed that foresters could easily involve farmers in PF in their villages using their own land, as compared to involvement in village-wide plantation on community land with complex tenure and/or use status. According to Banerjee (n.d.; 1989) and Kayastha (1991), the comparative success of farm forestry in India and Nepal was due to long and conflict-less granting of tenure rights to land. Evaluating West Bengal's PF programmes, Shah (1988: 15); also cited in Khan (1998a: 99); commented that "99 year land *patta* [leasehold] helped to instil a confidence and a feeling of ownership that encouraged [farmers] to invest effort in improving the productivity of their land" and to participate in SF. In Betagi and Pomora SF projects in Bangladesh, Rahman (1994), Quddus et al. (1992) and Khan (1998a) expressed the security of long tenure to land as the primary motivating factor for farmers to participate. According to the project documents of various public PF interventions in CHT, attempts were made to involve nomadic farmers as participants by allotting public land with long tenure arrangements.

It is no doubt that long-term security of land or permanent title serve as major motivating factors for people's participation in forestry

development. However, many other variables that affect the system and the surroundings of PF activities in a particular locality greatly influence the status and implications of land tenure. Locality-based social justification of land allotment with tenure rights, such as adjustment with the probable privileged section of society's interference, the possibility of curtailment of similar rights to other non-allotted individuals or groups in the locality, and land use strategy options, are mentionable. Besides, alternative lucrative land use options may lead farmers to be less interested in afforestation though they have been given the land and tree tenure rights. Farmers sometimes see afforestation as a subsidiary source of income rather than a primary activity, thus land allotted for social forestry may be used for quite different purposes (Khan, 1998a: 100). Moreover, sometimes trees can be used to establish rights to land (Fortmann, 1987: 17-26), and an understanding of tree tenure arrangements is imperative for PF (Khan, 1998a: 101). Hence, the granting of tree tenure rights in PF is a must for people's participation.

An important implication from tenure is empowerment. Empowerment in PF is linked to control over resources which in turn relates to land and tree tenure; therefore, tenure becomes an important aspect of people's participation. According to Chandra, et al. (1997: 17), different types of land ownership will allow for different types of empowerment and different approaches are required to manage various land types (public, private, community land, absentee landlords, etc). Granting rights to use resources is the most important means to empowerment. Appropriate mission and vision of participating agencies as well as farmers are essential. Combating pressure from vested interested groups, i.e. devising ways to minimise negative factors and issues are a necessity. Farmers' group formation helps in institutionalising the empowerment process. Well-coordinated and integrated approaches at the field level by all implementing agencies and communities are needed. Therefore, according to Bhatia et al. (1998: 77), the strategy for farmers' ownership requires facilitation of the empowerment process (not imposition), guaranteed long-term ownership or user rights to land and other resources to the farmer/people, changes to attitudes of government departments from target-oriented to process-oriented development programmes, farmers capacity building, investments made available to farmers, and technical support. This requires GO/NGO technical agents with persistence, commitment, innovation, dedication, and better communication skills to assist farmers in alternative institutional building.

In sum, trees need land to grow, thus ownership and/or control over land is a primary issue in PF. Control of land, trees and harvesting produce thereof, are major issues requiring consideration to achieve successful participation. However, this complex issue of “tenure” needs to be addressed in association with the particular locality-based frame (the system and the surrounding) of a PF project. Ambiguity over tenure status and failure to relate to the specific frame are proven cases for poor performances in SF (Barraclough and Ghimire, 1990). When farmers are accorded land ownership, they may not be able to productively utilise the land owing to other unfavourable variables (Khan, 1998a: 101). In Bangladesh, a highly populated country, competition between different land uses exists, the impact being the gradual expansion of agricultural land at the expense of forest land, transfer of forested land to the government (mostly in CHT and the coastal area), and reduction and degradation of community land. Patronisation, domination and migration are visibly seen in almost all the regions of the country. According to Davidson (2000: 31), displaced locals were used as cheap, bonded or contractual labour, often resettled on poor quality land and suffered grossly unequal terms of trade/exchange and exploitative money lending arrangements. For nomadic and displaced people of CHT, this statement is an absolute reality. Therefore, the present study area, CHT, being a site of numerous land related problems, obviously demands all the abovementioned land-related issues to be addressed for effective people’s participation in Participatory Forestry.

The Role of Forestry Organizations and Policy

Forest policies in the South Asian countries that experienced colonial rule were conceived and eventually promulgated by the colonial system of bureaucratic forest administration. The then colonial role of the government in general, and the Forest Department in particular, nourished the process of commercialisation and guided the vested interests of the commercial forces, the overall impact being the widespread alienation of local people from and around forest. Commercial considerations were followed even after colonial rule and policies formulated and adopted with the same motto of revenue generation and resource exploitation.

Later, the emergence of SF in almost all countries of South Asia shows the achievements in the form of physical target estimation - largely avoiding the inherent concepts of participation. SF gives preference to industrial needs over those of the people (Fernandes, et al., 1988: 268). Influenced by existing socially-framed policies,

government organizations rarely represent the voice, demands and interests of poor and weaker sections of local communities. Khan (1998a: 102), referring to regional case studies, stated that forest policies and departments often failed to play their catalytic and supportive role in facilitating the growth of local cooperative institutions for SF. In some instances, policy was found to be vague and ineffective, and in some other cases policy clashed with the goals of SF.

Pointing to the then forest policy of Bangladesh, Ahmed and Bhuiyan (1993) commented that the national forest policy largely ignored many crucial issues of SF, including the provision of community participation, specific rules for private forestry development, involvement of voluntary and non-government institutions, homestead forestry management, and the rights of forest dwellers and ethnic families. However, the current forest policy (1994) is different from the earlier policies, with a major shift from commercial considerations towards PF. In analysing the National Forest Policy 1994, Khan, et al. (2004: 119); stated that as compared to the earlier policies the 1994 Policy represents an initial move in the right direction, considering its (albeit partial) commitment to some of the issues which are considered vital for a people-oriented forest policy, such as sustainable development, poverty alleviation, local peoples' participation in forest protection, and government support for forestry development from any quarter.

The Forest Amendment Act, 2000 established PF as a function of the Bangladesh Forest Department, based on the National Forest Policy, 1994. Another milestone advancement is the adoption of Social Forestry Rules, 2004 in addition to the current Forest Policy and Act. It is mentionable here that some objections were raised about the SF rules to be implemented in CHT, in particular Section 14 of the rules. However, in light of the above current policy, acts, rules and regulations have so far achieved some headway on the path of PF. The issues and problems as identified by the Forestry Master Plan, 1993, such as land tenure, benefit sharing, technical management, etc., were in many cases fairly well accounted for in the course of time, as evidenced by Khan (2004:149).

The Role of Local Organizations

Indigenous institutions that relate to the indigenous pattern of resource management are still in existence with more or less vigour in many parts of South Asia. Besides, the commercialization of resources

adopted by the colonial rulers and perpetuated afterwards gradually induced some new patterns in local institutions. Local government councils and cooperatives are examples of these alternative government efforts for administrative penetration. However, these are quite different from the early indigenous institutions (Davidson, 2000: 32).

Extensive surveys have been carried out by many researchers to assess the performances and character of such introduced organizations and have commented that such organizations have been designed to maximise the central interests of the state and its local allies at the sub-national level. Their leadership is dominated by local elites reflecting the local power structure. Instead of collaborating with the existing indigenous institutions, they typically try to gain control over and restrict the re-emergence of indigenous institutions. Such introduced organizations are argued to be a carrier of powerful political and commercial interest of local territories, mostly under the guise of “rural development” and “decentralization” (Khan, 1998a: 55). Some early community PF initiatives, such as the *Panchayat* system of forest management in India and the Forest User Committee in Nepal, are the result of an effort to create “decentralized” and “participatory” local organizations. Exploring the performance of these efforts, it has been found that these organizations of local government are riddled by local factionalism and party politics, proper representation of classes and factions in a given community rarely occurs, rules and bureaucratic formalities of these organizations are mostly beyond the skill and understanding of the local people (cited in Davidson, 2000: 32).

These drawbacks, in association with many other retarding factors, are the causes of the limited prospects and selective nature of cooperation among the members of the local cooperative institutions in rural South Asia. Uphoff (1982), Korten (1987), Wade (1988), Attwood and Baviskar (1988), Poffenberger (1990a) and Khan (1994), also cited in Khan (1998a), all attempted to identify the conducive variables for facilitating effective cooperation. Their findings include the state’s commitment and support in promoting the growth of the cooperative structure, the control structure of the institution, the nature of a particular resource and the concerned users, conditioned cooperation by the nature of the production process, and responsible leadership guided by a credible structure of accountability. The above studies on the performances of cooperative institutions for rural development cited that these conducive conditions rarely exist in South Asia. Moreover, studying the performance of PF in South Asia,

Noronha and Spears (1985) and Cernea (1988) also commented the same. Consequently, the growth of endogenous cooperative organizations was retarded, and even when they were established, these organizations largely failed to play their desired role of empowering local communities (Khan, 1998a:111).

Social Relations and Power Structure

The relationship between people, land and power, in a complex form and arrangement, is a common prevailing phenomenon in villages of South Asian countries. “Generally speaking, in the agrarian and subsistence production systems of South Asian villages, social relations and power structures play a vital role in determining who get a chance at survival, in what terms, conditions or rights, and to what extent one is going to reap the benefit from any development programme” (Khan, 1998a: 112). Accordingly, in PF projects, social relations and power structures have a large influence. Performance of PF projects is obviously regulated by the social power structures, with manifold implications. Local peoples’ access to PF design, management and benefits is in many cases regulated by such relations and structures. Again, activities of local institutions govern these relations. Such relations also influence essential communication links between agencies and institutions.

Social relations and power structures arise in different manifestations with different degrees of influence on PF. Patronage relations between the poor and the rich in farmers’ cooperative institutional activities were observed in most studies of PF projects in South Asia. According to Wood (1994: 78-98), one dominant phenomenon of the political order of a peasant society in Bangladesh is the patron-client relations which to a great extent influence the factional pattern of competition for resources. On the basis of his extensive field studies in Bangladesh, he also commented that the socio-economic relationships within villages are not conducive to the forming of political organizations by poor peasants and landless populations within the village itself. Studying PF in Nepal, Hobley (1991: 116-117) found that farmers who benefited from projects had personal relationships with the patron and were closely allied with the local power structure. In Tamil Nadu and Bihar in India, Arnold, et al. observed that village forest committee decisions and activities were dominated by small number of elites through clientele relations; the weaker section of the community obviously possessing no power (1988; 1990; cited in Khan and Hasan, 1995a; 1995b). Therefore, the economic and social transactions in the agrarian production and

distribution systems of South Asia occur through a highly personalised patronage network (Zaman, 1984: 18); the most dominant feature of social relations and power structure. Hence, for analysing PF development programmes, understanding the profound and manifold implications of patronage relations in a particular social setting is of special significance.

Caste structure is a carrier for patronage operations. Studies on farmland afforestation in the Indian subcontinent showed that higher caste farmers performed well in terms of afforestation and marketing of products. Their superior caste status provided them with better links to the necessary resource-tapping structures of public goods and services, diversified income through patronage networks, and ultimately facilitated their role in dominating local institutions (Saxena, 1990: 6-8). According to Sharma (1991) and Baral (1993), local institutions concerned with PF in Nepal were mainly comprised of dominant ethnic and caste groups. Regarding caste dominance in local institutions and the related implications, Khan (1998a: 114) stated that biased leadership in local organizations, and high class or caste domination in the decisions and benefits of development projects (including SF) have been widely observed in many regions of South Asia. Again, fictive relations are another notable social structure that has implications for the consolidation of elites' power as well as sabotage of the benefits of development initiatives. According to the observations of Mashreque and Amin (1993), fictive relations enable the rural elites to gain greater loyalty and allegiance from clients, to command an increased number of clients, and to enjoy higher social status. In this way, these two notable forms of social relations, caste and fictive relations, substantially influence PF development in rural South Asia.

The promotion of social equity so that local communities benefit from PF projects is particularly influenced by locality-based social power relations. Experience in South Asia generally shows that richer farmers usually benefit from rural development projects. Case studies on PF projects in Bangladesh, Nepal and India show that projects often fail to equitably benefit the poor. Equitable involvement of rich and poor in project decision making and management is near invisible. As quoted in Khan (1998a: 115), "(t)his failure is, to a significant extent, attributable to the unequal social frame of south Asia (the working ground of SF) which is characterised by severe inequalities in income distribution and asset ownership; highly unequal access to resources, inequality in social structures and institutions, and severe competition

among unequal contenders for scarce resources.” Moreover, patronage and caste stratification served as a catalyst in the process of social inequity. The impact and performance of PF development programmes to a large extent depends on the complex nature of social relations and power structures associated with social and economic group formation under the influence of patronage links and other connections. “The reality is that since these relations are largely unequal and exploitative, the benefits of development interventions tilt towards the upper echelons of communities who control or are in alliance with those who control) the resources and power” (Khan, 1998a: 116-117).

Market Opportunities

To ensure that they benefit from PF, participating farmers should have control over the marketing of products in a form that is adjustable to the local situation. Some manifestations of such control of marketing of farm products, as outlined in Khan (1998a: 106), are the power of the farmers in controlling monopolistic market transactions, tackling middleman and intermediaries, choosing of the product selling outlet and ensuring regular supply, control over price fluctuations and ensuring fair price. Studies in this regard in the Indian subcontinent show that these are far reaching views. According to Fernandes, et al. (1988), Shah (1988), Saxena (1990; 1991; 1992), Malla (1993), Messerschmidt and Hammett (1993), Quddus, et al. (1992), Rahman and Khan (1994), Locke (1992) and Poffenberger (1990b), also cited in Khan (1998a: 106), major market-related problems consist of a lack of outlets to sell products, wrong choice of species, unequal and exploitative terms and condition of exchange and contracts, monopolistic domination by the powerful commercial forces and their agents, complicated bureaucratic rules and procedural formalities relating to marketing, bureaucratic harassment and corruption, lack of systematic market information, and inadequate advisory and logistic support from governments and other agencies.

In the Indian subcontinent, colonial governments paved the way for a host of commercial opportunists to infiltrate the local forest economy (Anderson and Huber, 1988: 34-35), assuming different forms in different situations. In CHT of Bangladesh, these opportunists were migrant businessman, local traders and contractors (CHT Commission, 1991). As opined by Barraclough and Ghimire (1990: 21), “(m)arkets everywhere and at all levels are subject to monopolistic manipulations... market forces are much better at increasing the wealth and power of the strong than of the weak.” Accordingly, poor farmers have little purchasing power and political influence to control and use

markets to their advantage. Exploitative marketing functions have driven away the desired allocation-based functions with the inclusion of commercial forces; this situation in existence still today.

Role of Donor Agencies

Ideas of community participation to redress the degraded state of resources originated mostly from international concern. PF in developing countries is assisted both financially and technically by international agencies. According to Fox and Fisher (1990: 116-117), the concepts of 'Social Forestry', 'Empowerment' and 'Participation' are western impositions on Third World countries. In the Indian subcontinent, donor agencies have a major influence in PF projects. International donor organizations in general have adopted policies towards PF efforts. UNDP, FAO, World Bank, ADB, and other United Nations organizations have placed emphasis on participation in the forestry sector by orienting their policies and implementing strategies towards PF. In favour of such PF policy orientation, a notable comment follows: "it is widely recognised that governments and development assistance alone cannot solve the deforestation crisis, success will depend on the active participation of the millions of small farmers and landless people who daily use forests and trees to meet their needs" (WRI, 1987: 27). One of the major advantages of international support is the opportunity for national governments to receive foreign funds for PF programmes. Most PF programmes in rural South Asia in general, and in Bangladesh in particular, are international donor agency funded and assisted.

One of the major negative implications of donor funded PF projects is that donor pressure to achieve targets in most cases compelled the concerned local officials to focus on achieving quantitative physical targets, paying less attention to participation and equity, the major concerns of Social Forestry. Shepherd (1993: 316-320) observed that donors deal in a hasty, high-handed and unsystematic way with national level institutions. They mainly instil the requirement of the bureaucracy to keep careful records on the achievements of physical targets, time schedules and quantitative statistics (Davidson, 2000: 74). As a result, government departments satisfy donors with little thought for the long term sustainability of any new arrangements. The following comment by Poffenberger may still be regarded as applicable in many cases of participatory forestry practices in the Indian subcontinent: "(s)ince forest programmes are generally assessed in terms of achievements of physical targets, participatory goals often

take second priority. Involving communities in decision making and management planning takes time. To stay on schedule, it is easier for the forester to take the lead in making plans for the activity including what species to plant, where and when [forest] departments have often held onto all decision making responsibly and management” (1990b: 9; as cited in Khan, 1998a: 118). Though some changes to PF practice occurred in the course of time, the Poffenberger’s statement is still more or less applicable in many PF programmes in South Asia in general, and of Bangladesh in particular, more specifically in the region of CHT.

Global Focus

History of forest management throughout the world demonstrates that forestry development activities were governed by territorial approaches. This was particularly true for the developing countries until the early 1970s. Until then, the key activities of forest management were exploitation of natural forest resources for industrial uses and industrial plantation schemes. Technical, tree-centred forestry was practiced ignoring the local people/communities dependency on forests for their livelihood. Exploitation and conservation were the main mandate of the then forest departments present in developing countries. This was definitely the case in the then British colonies, where total ignorance of the local peoples’ crucial role in forest resources sustainability is evidenced. It was thought that the development of natural resources by a government would automatically ‘trickle down’ so that the benefits would eventually reach the rural poor (Davidson, 2000). This view was that the government input towards development at the top would flow down to the poor at the bottom, an economic theory dating back to the 1950s.

The failure of forestry programmes up until to the mid 1970s hinted that the concept of ‘trickle down’ was not working. As stated in TFDP (2000; cited in Davidson, 2000: 7), the theory that “(t)he monetary benefit directed to the big business will automatically pass down to and profit smaller businesses and eventually the general public,” failed to match with the experience of forestry development programmes. Furthermore, it was concluded that the concept of ‘trickle down’ would not work because of “the ease which vested interests near the top could siphon of inputs to the detriment of the bottom.” (TFDP, 2000: cited in Davidson, 2000: 7) In this way, the importance of forests to local people, the importance of local people to forest development and the social diversity were recognised as affecting forestry work.

On the other hand, severe destruction of global forest resources came into view after the FAO's publication of periodic global forest inventories and monitoring program reports. Many governments and agencies characterise local villagers as enemies and destroyers of forest estates (Eckholm, 1976). The World Bank's *Forestry Sector Policy Paper*, published in 1978, predicted that Nepal's forest estates would be entirely destroyed largely due to local abuse (World Bank, 1978). At the same time, governments realised that only increasing staffing levels for protecting forest resources by policing would not bring useful results.

These lessons learned were responded to by international institutions. The FAO programme *Forestry for Local Community Development* (FAO, 1978) was a citable example of institutional response. Likewise, the World Forestry Congress, held in Jakarta, Indonesia, in the same year included the theme 'Forestry for People.' Initially, the focus was largely on fuel wood shortages and subsequent plantations. In that period, starting in mid-1980, some wasteland under local government control in India was planted with fast growing species of Eucalyptus in a SF programme. That then initiated thinking about the possible positive impacts of involving local people in forest management. It was also realised that forestry projects involving local people's participation were commonly benefiting wealthy and powerful individuals rather than the poor. People's needs at the bottom were not being fulfilled. Additionally, it was recognised that government staff could not provide effective services to rural people without institutional development and support (Davidson, 2000: 8), and the changing role of foresters from policing and enforcement to extension-based PF development was emphasised. Gradually, partnerships between government and local people and/or communities based on participatory forest management developed.

Progressively, useful tools for facilitating communication with individuals or communities such as Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA), Participatory Learning and Action (PLA) were developed and adopted by many institutions as methodologies for participatory processes. Today, SF management partnerships, engaging governments and local people together, to varying degrees, are found throughout Asia and the world, including Africa, Latin America, Australia, the Pacific Islands, North America and Europe (Davidson, 2000: 9). Therefore, PF is now a global paradigm, though naturally participatory approaches and management systems vary across regions, countries, and case by case.

Regional Factors

PF has been accepted and developed in varying intensity in most parts of the world, particularly in densely populated and developing countries. As Asia is the most highly populated continent of the world, PF practices are comparatively more significant. Within Asia, PF practice also varies from region to region depending on biophysical characteristics, population density and diversity, resource use patterns and management, etc. As Bangladesh is located in South Asia, study of PF development in South Asian countries is worthwhile for assessing and recognising the status and nature of PF practices in the country in general, as well as our study site, the ethnic peoples' habitat of CHT, in particular.

Bangladesh shares borders with Nepal, India, Bhutan and Myanmar. These South Asian countries have similar historical backgrounds of forest management. Khan (1998a: 16-68), identifies three stages encountered in the history of forest management in the region, Pre-commercial, Proliferation of Commercialisation, and Consolidation of Commercialisation, which were followed by transitional steps towards PF management. Gradual alienation was the result of progressive commercialisation that included the progressive diminution of local peoples' rights and access to forests and gradual dispossession and displacement of local communities. The result was conflict and mutual distrust between local communities and forest staff that ultimately became the root causes for deforestation and deflation of the natural resource base.

From 1970 onwards, the detrimental result of commercialisation and consequent alienation became a matter of concern for the governments of South Asian countries. The custodial and production forest management systems were found to be failing and there was "mounting conflict" between state officials and local people (Poffenberger, 1990a: xvii & 3). Citing the references of Task Force, (1987: 8) and Poffenberger (1990b: 278), Khan (1998a: 69) stated that at that time it was repeatedly asserted that the "responsible agencies are failing to sustainably manage the extensive tract of forest land that they claim" and that "it would be impossible [for government efforts] to succeed without people's active participation" (Khan, 1998a: 69). These realisations set the stage for the emergence of SF in South Asia (Khan, 1998a).

During the mid-1970s, most South Asian countries witnessed a major shift in forest policy in the form of participatory approaches to

forest management, more popularly coined as ‘Social Forestry,’ which aimed to redress past village exclusion and encourage rural development (Ribot, 1995: 1588; also cited in Khan 1998a: 69). Thus, PF gradually emerged with accelerated vigour and diversified philosophies based on diversified local contexts. Therefore, differences exist in the nature and magnitude of PF activities among the countries of South Asia. Moreover, within countries there exist local and/or regional variations also. Although variation is present, some common goals of PF activities can be identified. According to Khan (1998a: 70), these include increased participation of local people in the planning, implementation and benefit distribution of forestry activities, fulfilment of local demands, promotion of self-reliance and social equity among local communities, increased income, productivity and standard of living for the participating farmers, and the growth of local cooperative institutions. Though PF programmes have much in common in their underlying philosophy and theoretical considerations, all states in South Asia do not specifically use the term Participatory Forestry. The PF approach to forest management is also known as Community Forestry (CF) in Nepal, Social Forestry (SF) in India and Community and/or Social Forestry in Bangladesh.

Bangladesh Perspectives

Previously, Bangladesh was full of trees and forests. Gradually, due to increasing pressure on forest resources to meet the growing demands of the increased population pressure, as well as related socio-economic factors, forest resources underwent a striking decrease. Even 30-40 years back the amount of tree-covered government forests were more than 20 percent (Hossain, 2006: 13), but that tree-covered area has decreased to 6-7 percent at present. At the time of the partitioning of the Indian subcontinent in 1947, the area now known as Bangladesh had more than 2.1 million hectares of land covered by forest (Task Force, 1987). According to Chowdhury (2006: 13), over several decades, there has been large degradation of forests. Forest areas in Bangladesh have been degrading owing mainly to such reasons as population pressure, illegal commercial logging, organised encroachment and conversion of forest land for agriculture and homestead purposes, climate change, erosion and poor governance.

Out of the 64 districts in Bangladesh, 28 districts have no public forest (Bhuiyan, 1991). Hilly lands of the country, including CHT, are mainly used for forestry, horticulture, tea and rubber cultivation. Shifting cultivation by the ethnic forest dwellers, high deforestation rates due to over-exploitation and traditional forest management

practices (clear felling-cum-artificial regeneration), faulty horticultural and hill-farming practices, and an increase in population due to settlement of people from the plain land areas and by new births in the hills, are the main contributors to the degradation of the watersheds, causing catastrophic soil erosion on hills, frequent flash floods in the adjoining plains, silting up of rivers and their tributaries, as well as lakes and reservoirs, and low water yield for consumption by plants during the dry season (Huq and Alim, 1995: 7). While major portions of the natural hill forests are inaccessible and, hence, either under-utilised or unutilised, the accessible forests have been over-utilised or denuded and in parts encroached. Furthermore, there is very little scope to expand forest areas horizontally (Khan et al., 2004: 26).

However, recently PF practices have been accepted as a well adapted strategy for saving remaining forests as well as the long-term sustainable development of forests. SF has been increasingly believed to be the most feasible strategy for the long term sustainability of forest (Khan, 1998a; Millat-e-Mustafa et al., 2000). In fact, institutional and project approaches to PF in Bangladesh emerged as early as 1967 and gradually developed through government and other initiatives.

The Forestry Sector Master Plan formulated for the period 1995 to 2015 placed importance on PF involving poor people in and near forests as a strategy for sustainable forestry development in Bangladesh. According to GOB, (1995: 33; also cited in Khan et al., 2004: 15), community forestry and socially-oriented allotment forestry will be promoted by giving priority to poorer communities and poorer members of the community in the allocation of such contracts for tree plantations. Women and poor people who do not have a land-based source of livelihood will be employed on priority basis in nurseries, plantations, forest management, harvesting and industrial work. Here also, by recognising the Bangladeshi people as strength for development, PF development through people's active, goal-oriented involvement can contribute to poverty alleviation. Active people's participation in tree growing and forest management can directly benefiting participants, and the Forestry Sector Master Plan provides an avenue for creating appropriate conditions based on community, local systems and surrounding environments, etc. Moreover, the national Forest Policy, 1994, which reflected the recommendations of the Forestry Sector Master Plan firmly, posits PF as a means of forestry development for poverty alleviation and sustainable development of Bangladesh's forests. Accordingly, in line with the

national Forest Policy, 1994, PF as a function of the Forest Department was established specifically by the Forest Amendment Act, 2000 and social forestry rules were formulated and enacted.

PF Activities in Bangladesh

The Bangladesh Forest Department started PF activities by introducing forestry extension services in 1967. In that year, the Forest Extension Division with headquarters in Dhaka and Rajshahi started functioning. Establishment of nurseries and training centres in some district headquarters and important centres, seedling raising and sales in the nurseries, were its main tasks. Extension activities were confined to advertisement in newspapers and distribution of posters during seasonal tree planting campaigns. These limited, small-scale activities were confined to those areas where nurseries were raised. Later on, the programmes were extended to the then sub-divisional headquarters. These very small and limited activities did not have a significant impact. Marginal, encroached and denuded land afforestation through the involvement of poor or marginal people was not attempted. Later on, FD introduced many project activities that involved, and gradually increased, people's participation in forestry development.

i. Betagi-Pomora Community Forestry Project

This was the first community forestry program in the country. Betagi was located on *khas* land, a denuded hilly forest area in the district of Chittagong and the adjoining Pomora *mouza*, a protected forest area. In the Betagi area, 101 poor and marginal people were selected and land was provided for each selected family on the condition that they developed farming practices and lived on the land, with emphasis placed on tree and horticulture farming including agriculture. The project was a part of the then Shawnirvar project of the Government Krishi Bank who provided credit to them, with Grameen Bank supervising the credit and its realisation. Evaluation after one year considered the project satisfactory. This success encouraged the initiation of another similarly-modelled program in the denuded protected forest area in the adjoining Pomora *mouza*. Land was selected and distributed lands to 243 families. The Betagi project was visited by many local and expatriate experts and policy makers. They were impressed by the success of the project, and ultimately the participants were granted tenure rights over their respective allotted areas. Tenure rights were given jointly to the husband and wife, with fifty percent shares for each of them. Such system for providing joint

tenure rights has impacted on their family life. There was no break-up or separation of the husband and wife. This social benefit and the financial benefits from the project are worth mentioning.

ii. Forest Extension Service Scheme

Since 1962-63, with the creation of Forest Extension Divisions, the need to expand extension services was felt to be realistic necessity, yet the actual expansion rate was quite insignificant. At last, in the year 1980, in order to speed up the programmes, a scheme for the expansion of forestry services was prepared. Under this scheme, 4 extension divisions were created. A project for development of Forest Extension Scheme (Phase-II) started in 1980-81 and ended in 1984-85. According to FD sources, 5 crore seedlings were raised, 1,513 miles of strip plantations in roads and railway tracks and embankments and union *parishad* roads were planted. Additionally, a 500 acre area was planted by commercial forestry programmes and 3,118 villages were taken under planting schemes. In this way, forestry started placing its foot firmly in government marginal land and denuded forest areas and also in the villages.

iii. Community Forestry Project

The duration of the project was from 1980 to 1988. 7 districts: Rangpur, Dinajpur, Pabna, Rajshahi, Bogra, Kustia and Jessore, formed the project area. The project's main activities were to establish strip plantations along roads and highways, railway lines, canal banks, connecting roads with the district and union *parishad*, and fuel wood plantation on denuded government forest land. Additional activities included agro-forestry farms and homestead forestry activities through already established community forestry growth centres and establishing nursery growth centres, establishment of a training school in Rajshahi, and creating regional offices and institutional supports.

Physical targets of plantation establishment were mostly achieved. FMP (1993) commented that the project was successful as a prime SF project in Bangladesh. According to Khan, et al. (2004), very few avenues were provided for achieving the social targets. Seedling distribution to the villages for homestead forestry development did not reach even 50 percent of the target. Extension services were inadequate and farmers' species choices were not duly attended. There was no formal document given to farmers to safeguard their rights and benefits. Anyhow, this project, as an attempt to introduce a participatory approach in producing forest resources and guide their management, is counted as a notable early attempt.

iv. Upazila Afforestation and Nursery Development Project

The duration of the project was from 1989-1996. This ADB-funded project was formulated based on the success of the above Community Forestry Project and the government-funded Forest Extension Scheme (Phase-II) project. It covered the whole country except the Chittagong Hill Tracts and the Sundarbans. The objective was to strengthen the human and technical capability of FD to implement a nationwide PF program, which as a result would increase the production of fuel wood, timber, etc. Its main activities were strip plantation along highways, railways, embankments, feeder roads, etc; institutional planting in schools, religious institutions, office compounds and other public places; raising and distribution of seedlings; wood lot plantations, agro-forestry plantation, and afforestation in vacant land and outside BWDB embankment; development, maintenance and upgrading of forest extension nursery centres; training officers, staff and village leaders, etc.

The physical targets were mostly achieved. In regards to participatory achievements and socio-economic issues, some very inadequate studies were found that showed the level and context of participation by the beneficiaries varied due to location, overall context of the system and the surroundings. Wood lot plantations were found successful in many areas, but in some places, due to participants want and eagerness to get early benefits, resulted in failure. In almost all cases, participants' contribution was to protect the plantations. Participation in plantation protection also varied depending on the type of plantation and early benefits. Agro-forestry participants were found to have actively participated due to the opportunity to get agri-products early on, as well as to collect leaves and twigs of planted tree species. Though intensity was comparatively less in protecting wood lots, the opportunity to practice agriculture in the early stage and later on, to collect leaves and twigs from planted tree species, were the main attractions for participants in protecting plantations. In the majority of cases of strip plantations, participants were found to be very reluctant to guard the plantation because of the lower number of trees in possession of each participant, which gave the early view that after maturity the benefit would also be less. Moreover, in strips, it was also comparatively difficult to protect the seedlings from damage due to livestock grazing. Anyhow, this project generated increased bio-mass fuel production and participants benefited from agri-crops, pruned produce, leaves and twigs, etc. It is mentionable here that after harvesting on completion of rotation, a notable amount of money was

obtained by many participants, which significantly contributed to their poverty reduction as well. Wood lot plantations established through this project in Dhaka, Mymensingh, Tangail and Dinajpur may be cited as remarkably notable examples.

Overall, although physical targets were mostly achieved, the nature and extent of participation was limited. Due to a top-down marginal approach, the decision making role of participants in all types of plantations was minimal in this project. FD did widen the scope of PF activities, but had not yet engaged participants in decision making and management in planting, managing, marketing and benefiting from trees. Moreover, some deserving landless farmers, marginal farmers and women failed to be included as participants due to patronage effects in the locality. Forestry groups were formed, but functioned only partially; as such, the objectives of formation of community organizations by the participants was partially successful.

v. Forestry Master Plan

This is a technical assistance from ADB to formulate a 20-year (1993-2012) Forestry Master Plan for the country with the objective to provide a framework to develop forest resources for environmental stability and socio-economic upliftment. Among other issues, PF was dealt with a separate chapter, where social issues in particular were not incorporated adequately. The plan document was successfully produced, covering many thematic issues, including PF. However, according to Khan et al. (2004: 35), except for a number of (rather terse) occasional references, especially in the chapter titled 'Participatory Forestry', treatment of the social issues in general and poverty reduction concerns in particular have remained inadequate in the main plan. In formulating the plan stakeholder consultation, especially with forest-dependent communities, has been reported to be inadequate.

vi. Forest Resource Management Project

The duration of the project was 1992-2001. It was a World Bank-funded project with wide implementation across the country, except in CHT. Titled Participatory Forestry Development (PFD), the major SF activities in the project were practiced in Chittagong and Cox's Bazar Forest Division. The aim was to establish agro-forestry plantations in the denuded government forest lands in Chittagong and Cox's Bazar through PF activities.

Physical targets were achieved. Selected farmers, mainly the encroachers of the concerned encroached and denuded government

forestlands were allotted 2 hectares and 1 hectare of land respectively, depending on prevailing conditions when agro-forestry plantations were raised. The participatory achievements were inadequate. Khan, et al. (2004: 36) explain this inadequacy as participant groups being formed, but not working properly. Group activities were minimal and farmer involvement was mostly ineffective due to the illegal links of some participants with influential local elites that made plantation protection difficult. Poor participants could not give much time to farming as they were mainly involved in the off-farm activities.

vii. Coastal Greenbelt Project (1995-2002)

The principal goals of the Coastal Greenbelt Project were to protect and improve the coastal environment by increasing tree cover and to reduce poverty by providing the poorer segment of society with supplementary income opportunities. The progress in implementation and achieving the development objectives of the project was rated satisfactorily.

The physical activities implemented through this project were the establishment of 8,934 kilometres of strip plantation, 665 hectares of foreshore plantation and distribution of 1,256 million seedlings to the people of the project areas. Under this project, a total of 48,561 people were trained in a prescribed course on SF. About 143,936 participants and more than 100 NGOs were engaged in the implementation of the physical activities of the project. This project generated employment for more than 3.5 million man-days. Participants received direct benefits from intercropping vegetables and extracting fuel wood, fodder and fruits. Through benefit sharing agreements, it was tried to increase participation of the participants. Women's participation increased as time progressed. NGO involvement and their activities in public awareness building were found to be inadequate.

viii. Forestry Sector Project (1998-2004)

The Forestry Sector Project is the largest public sector PF intervention in Bangladesh. The aims of the project included institutionalisation of forest resource management through local community participation, increasing production of biomass, conservation of forests in selected protected areas, policy reform and institutional capacity building of the Forest Department.

The physical achievements of the project include the establishment of 12,375 hectares of woodlot plantation, 3,708 hectares of agro-forestry plantation, 1,035 hectares of block plantation, 6388 hectares of

buffer-zone plantation, 1,850 hectares of *char* land plantation, 14,353 kilometres of strip plantation, 1,050 hectares of enrichment plantation in the protected areas, 6,187 hectares of plantation in the degraded *Sal* forests and training in SF for 139,501 people among the stakeholders. About 460 NGOs were involved as partners of the Forest Department in implementing the activities of the project.

The achievement in terms of reform of the policies and institutions was considerable. The Forest Act, 1927 was amended in the year 2000 and the Social Forestry Regulation was formulated in 2004. The participation of the local people was encouraged by the distribution of benefits of the first rotation felling.

ix. NGO Interventions in Social Forestry

SF activities with different approaches were implemented by a large number of non-government organizations throughout the country. According to the database of the Association of Development Agencies in Bangladesh (ADAB), about 57 percent, i.e. 482 NGOs, were involved in SF activities during the last three decades. Interventions by the majority of NGOs were confined to homestead plantations.

The majority of the NGOs were involved in micro-credit, either with funds drawn from donor agencies, or involving the savings of the beneficiaries. Many of these NGOs consider micro-credit to be a source of the organization's income and perhaps form groups purely for credit purposes, later aiming at promoting sustainable development of the poor. To provide an understanding of the SF interventions of the NGOs in Bangladesh, the involvement of the major NGOs are presented below.

The Bangladesh Rural Advancement Committee (BRAC)

The Bangladesh Rural Advancement Committee, popularly known as BRAC, is the largest NGO of the country in terms coverage and activities. The main activities of BRAC fall into the areas of micro-credit, education, health, poultry, livestock, agriculture, fisheries, sericulture, horticulture, handicrafts, small enterprises, agro-forestry and social forestry.

BRAC started its SF programmes with homestead plantations via the distribution of seedlings drawn mainly from government nurseries in 1977. With an increase in demand, it started its own nurseries to supply seedlings to beneficiaries. Since 1988, BRAC scaled up its SF programmes and also collaborated with the government in different projects. The main objectives of its SF programmes are to generate

income and employment opportunities for poor rural women and to ensure supply of a sufficient number of good quality seedlings to meet the local demand. The major components of the SF activities of BRAC are nursery development, afforestation, agro-forestry, block plantation and floriculture.

BRAC established 24 large nurseries of its own and 7,762 nurseries owned by its village organizations. A total of 1,253 kilometres of roads have been brought under plantation programmes and 1,613,967 seedlings have been planted involving 7,323 members. It started a coastal afforestation program after the cyclone of 1992 and an agro-forestry program 1991.

The Proshika Manobik Unnayan Kendra (Proshika)

Proshika was established in 1976 and at present it is one of the largest NGOs in Bangladesh. Currently, the coverage the Proshika extends to 22,917 villages in 252 *upazilas* in 57 districts. The major programmes of Proshika include people's organization building, human development training, education, employment and income generation, ecological agriculture, livestock development, fisheries development, housing, health, disaster management, social forestry, small enterprise development, research, communication, support to other NGOs and development of the urban poor.

Proshika initiated its SF program in 1985 by the establishment of strip plantation along 22.5 kilometres of *Upazila Parishad* road in Sirajganj involving members of its organised groups. The SF programmes implemented by Proshika are i. Homestead plantation- 13,786,003 seedlings, ii. Institutional plantation- 472,378 seedlings, iii. Strip plantation- 14,671.0 kilometres, iv. Block plantation- 941 hectares, v. Block plantation in forest land (participation with FD), vi. Protection of *Sal* forest (participation with FD), and vii. Development of 2,948 nurseries.

Rangpur Dinajpur Rural Service (RDRS)

RDRS started with emergency relief and rehabilitation activities in the greater Rangpur and Dinajpur districts in 1972. It became involved in SF programmes in 1977 with the involvement of its organised groups by planting trees in the homesteads. It later extended its SF programmes to strip plantation and institutional planting. During 1988-1997, RDRS planted over 2.5 million trees with the support of the WFP and during 1995-2000 planted 1.3 million trees with funds from the Inter-church Organization of Development Cooperation.

Caritas Bangladesh

Caritas launched its SF programmes in Bangladesh in 1986, covering 24 *thanas* from Barisal, Chittagong, Dinajpur, Dhaka, Khulna, Mymensingh and Rajshahi regions, and later on extended their activities to CHT, more particularly in Bandarban district. Other than homestead plantation and strip plantation, it undertook extensive motivational campaigns to educate people on the importance of tree plantation. The participants of the Caritas projects planted 247,668 homesteads and 210 kilometres of road. Caritas gave technical training to 1,738 members on nursery management and 905 village-based nurseries were set up with the direct assistance of Caritas Bangladesh.

Studies on People's Participation in Bangladesh

Nath and Inoue (2008a) carried out a research work on the Upland Settlement Project in CHT, exploring PF as means to reducing land degradation and improving rural livelihoods. They found that planters had given up shifting cultivation and adopted soil conserving agro-forestry practices, thereby forest coverage increased. They also found that, assisted by PF agency personnel, planters adapted to diversified livelihood strategies, thereby improving rural livelihoods. Nath and Inoue (2009a) carried out another research work on sustainability attributes of a small-scale betel leaf agro-forestry system practiced by the *Khasia* ethnic community of Sylhet in Bangladesh. They found that the betel leaf agro-forestry system is stable under the prevailing traditional management system because of the presence of several positive attributes of sustainability, including the composition of agro-forestry, disease control, soil fertility management, profitability, socio-cultural acceptability and institutional support.

Khan (2009) reviewed the forest policies of Bangladesh. He argued that the Bangladesh state policy response to the 'problem' and development of the forestry sector has been rhetorically loaded, but politically cautious, covert and calculated. He also noted that forest policies of Bangladesh empowered some (e.g public forestry officials) and silenced others (e.g restrictions put on 'land grabbers' and 'encroachers'). He also identified forest policies of Bangladesh as political technologies to depoliticise and shape 'target group' conceptions and distribution of services as escape hatches to hive-off difficult responsibility and acceptability questions and as a lever to master and wield power by the state. He also called for increased research on this relatively less-explored area of study.

Nath et al. (2005a) carried out research in CHT on small scale agro-forestry for upland community development. They found that the agro-forestry interventions have increased farmers' incomes through employment and the sale of farm products, as well as by improving the ecological conditions of these areas through reduction of soil erosion, increasing tree coverage and maintaining soil fertility. They noted that the adoption of different agro-forestry systems was governed mainly by the farmers' interests in following these techniques, their ability to cultivate the land in the prescribed manner, and the market demand for their products. Additionally, they observed the major obstacles to agro-forestry improvements included lack of confidence in new land-use systems, inappropriate project design (e.g top-down innovation approach), and policy issues regarding land tenure. They recommended strengthening social capital in local organizations to enhance the livelihoods of upland communities.

Nath and Inoue (2008b) conducted a research work in Bandarban district of CHT titled *How Does Local Governance Affect Project Outcomes?* Their findings indicate that the project authorities could not adequately attain project objectives because of a low level of participation, lack of accountability and transparency in handling project money, gaps in communication and information flow and the poor response of project staff. For better project outcomes, they recommend that governance situations need to be improved through the formation of social capital.

Nath et al. (2005b) conducted an empirical study in Khagrachari district of the CHT titled *Shifting Cultivation (Jhum) in the Chittagong Hill Tracts, Bangladesh: Examining its Sustainability, Rural Livelihood and Policy Implications*. They found that in traditional *jhuming*, production declined markedly, yields were almost equal to input values and farmers experienced food shortages for at least two to six months in a year. To make a living, farmers adopted new occupations such as wage labour, animal husbandry, cultivation of annual mono-crops and extraction and selling of forest products. They noted that previous government policies were unable to reduce shifting cultivation intensity or improve ethnic people's livelihoods or the region's forest resources. They recommended reorientation of government policies, easy access to institutional support and the active participation of local people in development interventions in order to find alternative land uses for sustainable hill farming to improve the farmers' living standards and to conserve forests and protect watersheds.

Mantel, et al. (2006) noted in the report on the inception workshop of the Chittagong Hill Tracts Improved Natural Resources Management (CHARM) project that deforestation, soil erosion and loss of biodiversity are of great concern for the environment in the CHT. They recommended that local institutional capacity for natural resources management, including the compilation and maintenance of data, should be improved. They also recommend that activities in documentation and dissemination of successful land management approaches and technologies, both indigenous/traditional and scientific/newly acquired knowledge should be supported.

Kamal, et al. (1999) conducted a study on land policies, land management and land degradation in CHT as a part of Hindu Kush Himalayan (HKH) region. They advised that holistic land policies are needed to integrate the hill people with the mainstream process of development in Bangladesh if land degradation in the CHT is to be curtailed and the ultimate goal of sustainable environmental management achieved. They also recommended that all efforts should be made to integrate hill people into the process of development at the planning and implementation stages.

Nath et al. (2003) carried out a study on the *Khasia* tribe in Sylhet district of Bangladesh, especially on their socio-economic status, hill farming practices and impact on forest conservation. They found that betel leaf-based hill farming practiced by *Khasia* not only provides income and employment opportunities, but also plays an important role in the conservation of the forest and its floral diversity. They also found that a buoyant market for betel, ease of establishment and maintenance and the regulation of different tree age-classes make it a sustainable production system that assists in conserving biodiversity and might be adapted for use elsewhere.

Pelinck (1995) noted in the report of the national workshop held in Rangamati, Bangladesh on experiences in development of Hill districts that there is a need to carry out extensive afforestation programmes, especially on C and D class lands, and to develop agro-forestry in the hilly areas in order to forestall the deteriorating trends and to maintain an ecological balance. It was recommended that appropriate, area-specific land use technologies be developed and introduced and cash crops including subsistence crops should be included in hill farm cropping patterns. It was also recommended that socially acceptable and economically viable, appropriate farm technologies should be introduced and integrated farming systems encouraged.

In the CHT region development plan, Hassan and Lavieren (2000) recommended that the activities of FD in CHT remain confined within the (i) development and management of PF, (ii) farming policy for development of SF ensuring an equitable share for participants, (iii) provision of technical assistance and extension services to participants, (iv) ensuring availability of good quality seeds, seedlings and other propagates of forest tree species and horticultural ethno-botanical, medicinal and other plant species for planting at SF sites. They also recommend that the opinions of participants in selecting tree and other plant species for SF, agro-forestry and homestead forestry sites be given due consideration.

Khan et al. (2005) carried out a study on *Shifting Cultivation (Jhum) in CHT: Farmer's Perceptions and Implications for Sustainability*. They suggested that the practice of *jhum* is deeply rooted in the local socio-cultural fabric of the ethnic farmers of CHT and this age-old practice has presently moved towards an unsustainable state. They note that a drastic ban or total abandonment of *jhum* does not seem to be a realistic proposition in the context of the practicalities of the field. They also recommend that any attempt towards designing or introducing new or improved technologies needs to be very carefully weighted in the empirical context of the particular targeted locality and an intensive motivational campaign to highlight the immediate and long term benefits of proposed system should be considered.

Khan et al. (2003) conducted a study on a holistic approach towards PF as a means of poverty reduction and upland development in the CHT. They inferred that PF activities have resulted in increased status and recognition of the farmers by providing them with the ownership of the land and augmenting their income level. They have also found that PF projects have contributed to an expansion of tree coverage in the area and a reduction in soil erosion by adopting a number of social conserving agro-forestry practices. They also found that farmers' participation in the decision-making, monitoring and evaluation of PF projects is insignificant and their participation is limited to working in agro-forestry and rubber plantations.

Khan and Begum (1997) carried out a study on participation in SF, re-examined as a case-study from Bangladesh, enlisted as the forest area of Chandra located in the Kaliakair Thana of Gazipur district. They found that people's participation in SF in Bangladesh has been insignificant and marginal. They also inferred that people have virtually no major involvement in participatory SF project-related

decisions and evaluation, but rather perform within strict bureaucratic limits.

Khan and Khisa (2000) carried out a research work on *Exploring Gender in a Participatory Agro-forestry Project in Bangladesh: Some Ethnographic Reflections in CHT*. They observed that women play the most active role in the management of the household and agro-forestry activities in the study area, although their contribution is not readily recognised. They found that women's participation in the formal/institutional sector is limited due to such reasons as reduced mobility, lack of appropriate information and education, and insufficient control over relevant resources. They also observed that in the absence of an effective gender policy, the overall working environment for female staff is not very conducive and the level of female participation in project management is insignificant. Overall, they found that the participatory agro-forestry project increased the social status of women both at the family and organization level.

Khan (1997), in his paper on the importance of integrated watershed management in Bangladesh, published in the proceedings of the National Workshop on Participatory Approaches to Integrated Watershed Management in Bangladesh, emphasised that an integrated watershed management programme is an urgent need for sustainable development of the forested hilly region of the country. He also noted that integration strategies of watershed management should be based on the productive use of land, water, forest, livestock and human resources of the region.

Khisa (1997), in his paper presented at the National Workshop on Application of Indigenous Technology/Knowledge in Watershed Management held at the Bangladesh Forest Academy, Chittagong, noted that in the course of time, due to the erosion of indigenous technology and knowledge and ignorance and neglect of ethno-botany caused by external factors and pressure, the current process of degradation of forest resources and watersheds is taking place. He suggested that policy makers, forestry and watershed conservation experts and ethno-botanists need to be aware and more attentive to the needs and rights of the local/ethnic communities in order to have participatory watershed, forest resource management and biodiversity conservation in CHT.

Khan and Khisa (2001) noted in their paper presented in the proceedings of an international symposium on mountain agriculture in the Hindu Kush Himalayan region that the extent of adoption of

Contour Hedgerow Inter-cropping Agro-forestry Technology (CHIAT) has remained low because of unsecured land tenure, economic hardship, high degree of labour intensity, high cost of technology, lack of institutional credit services, insufficient logistical support and the psychological strain associated with the transformation from a nomadic culture to a relatively permanent form of living. They also observed that even with these limitations, CHIAT remains a promising technology which has contributed significantly to reducing runoff and soil loss and augmenting biomass production.

Khan (1994) carried out a study on participation in SF in South Asia. He found that albeit the widespread popularity and advocacy, the role of SF in ensuring participation and in empowering the local population was insignificant and marginal. He also observed that participation in SF, in its common form, is yet another style of bureaucratic manipulation, where people are invited to act within the strict limits and guidance of central authority.

Rahman (1989) carried out study on the socio-economic impact of Pomora Community Forestry Project. He suggested that a model like that of Pomora Community Forestry Project, if properly developed, may substantially contribute towards solving national problems like unemployment, poverty, food and forest product deficits by depicting a way of optimum utilisation of the hitherto unproductive unclosed state forests, protected forests and hilly *khas* lands of the country.

Khisa (1998) wrote a paper on the Upland Settlement Project in CHT entitled *Upland Settlement Project within a Sustainable Agro-forestry Farming System: A Sustainable Development Initiative for the Tribal Communities of CHT, Bangladesh*. He found that the rubber-based agro-forestry settlement programme has created employment and income-generating opportunities, making a move towards a more sustainable livelihood for the people of the region possible. He suggested that the rubber-based agro-forestry settlement programme be further promoted in CHT.

Nath and Inoue (2009b) carried out research work on the forest based settlement project and its impacts on community livelihood in CHT. They found that customary forestry practices (Shifting Cultivation) could not support participants' livelihoods year round, thus by joining in the settlement project they could improve their livelihoods. Many project participants had given up customary forestry

practices completely and diversified their livelihood strategies. They also advocated for effective participation that would heighten participants' sense of ownership, enhance collective management and ensure long-term project sustainability.

Selected Major PF Programmes in CHT

Among the several PF government and non-government projected interventions, the following projects have been selected for study under this research initiative. The primary basis of the criteria for selection was the technological differences of PF interventions in CHT.

Farming System Research and Development (FSRD) Programme

The Bangladesh Forest Research Institute (BFRI) conducted the participatory forestry projects entitled Farming System Research and Development (FSRD) Programme at Bandarban site, located at Sualok Union under Bandarban Sadar Upazilla. The FSRD Programme was initiated in 1986-7 with the objective to enhance the socio-economic condition of the hill farmers by adopting improved tree-based farming technologies (Paul and Emdad, 2000).

Biophysical and Socio-economic Conditions

Topography represents narrow valley to moderately low and high hills in rugged and undulated terrain having sandy to sandy clay loam soil, pH ranging from 5.0 to 6.0, annual temperature varies from 16°C to 35.9°C and average annual rainfall is 2718mm.

The local economy is based mainly on cultivation. Cultivation of forest and fruit trees like teak, *gamar*, mango, jackfruit and banana, and *jhum* practice with mixed cropping of rice, maize, sesame, chilli and *marfa*. In the hill slopes and valleys, rice and vegetables such as cucumber, brinjal, bean, watermelon, tobacco, gourd, potato, etc. are common. Poultry, pigs and cattle rearing are present, but not commonly seen. Though seasonal ditches are also found, scattered aquaculture is rarely seen. Steepness, erosion hazards and sometimes prolonged draughts are the limiting factors for cultivation (Paul and Emdad, 2000).

Operational Design and Implementation Process

The field implementation of the FSRD programme was initiated and carried out in two steps. As a bottom-up approach, the Participatory Rural Appraisal (PRA) was conducted in the location of the

interventions. Aiming at identifying the problems and opportunities of the hill farmers, the situational analysis was conducted through the PRA. A multidisciplinary team interacted with the help of certain tools and techniques of PRA, like physical mapping, production of flow charts and transect preparation. Semi-structured questionnaires were also applied during interactions with the farmers. Triangulates were applied in synthesising the results of the interviews. Through repeated discussions, the problems and opportunities of the target sites were finalised. This resulted in developing the hypothesis that emerged, which eventually served as a starting point for the research and development implementation process. The programme included both generation and dissemination of technologies with broad coverage of bio-physical and socio-economic settings, improved forestry and agro-forestry production systems, early returning crops, livestock rearing and aquaculture techniques.

The research and extension programmes carried out in the field are as follows: 1) Studies on Differentiated Slope Agro-forestry method (DSA); 2) Developing techniques of soil conservation and soil management practices for slope-land conditions; 3) Devising multi-storeyed home gardens; 4) Studies on the socio-economic impact of agro-forestry interventions; 5) Assessment and improvement of women's role in respect to agro-forestry activities; 6) Demonstration of Sloping Agriculture/Agro-forestry Land Technologies (SALT); 7) Introduction of improved agro-forestry management practices; 8) Use of pre-rooted and pre-rhizome branch cutting techniques for bamboo cultivation; 9) Popularisation of the techniques for preservative treatment of bamboo, sun grass, wood, etc; 10) Beef fattening programmes; 11) Introduction of improved chicken/broiler/duck rearing; 12) Introduction of improved aquaculture techniques using small water reservoirs/ponds; and 13) Introduction of auger hole techniques for plantation.

The implementation process of the FSRD programmes is supported by strong linkage of researchers, extension workers and farmers. For this purpose, a Site Working Group (SWG) consisting of researchers, extension workers of the Forest Department (FD), Department of Agriculture (DAE), Department of Livestock (DLS), Department of Fisheries (DOF), plus one NGO and two farmer representatives were formed. Besides, linkages have also been established with Bangladesh Agriculture Research Council (BARC), NGOs and private organizations during the implementation process of the FSRD programme. Training to the farmers, on-farm trials, demonstrations,

field days, etc. are the important mechanisms utilised for technology transfer.

Impacts and Implications

Through implementation of the FSRD programme, diverse information, technologies and dissemination approaches have been developed. Participatory farmers involved in the R&D process benefited from the social, technical and economic aspects.

The research programme in general resulted in the generation of some agro-forestry technologies suitable for the hill region of Bangladesh. These are: 1) Sloping Agro-forestry/Agriculture Land Technology (SALT); 2) Differentiated Slope Agro-forestry method (DSA); 3) Natural Vegetative Strip method (NVS); and 4) Contour Tress Line (CTL) techniques. The improved agro-forestry methods are characterised by a combination of different forest and agriculture crops which are capable of stabilising land, restoring soil fertility and reducing soil erosion in the slope land conditions, improving productivity and as well as uplifting socio-economic conditions of the hill farmers.

Implementation of the research programme was carried out in on-farm conditions with direct participation of the land owning farmers. Most of the farming activities were led by the farmers and their families. The major inputs like seeds, seedlings and fertilisers were provided as project costs. In carrying out the production activities under their respective technological approaches, technical assistance from both research and indigenous knowledge was supported. As resource-poor farmers are the target clientele, the benefit sharing mechanism is designed entirely in favour of the participatory farmers.

Integrated Afforestation and Jhumia Rehabilitation in the Unclassed State Forests of Chittagong Hill Tracts

This is a project of the Bangladesh Forest Department (FD) was implemented in the 1984-85 to the 1988-89 financial year. Covering the three hill districts of CHT, this GOB-funded project was implemented with the objectives of increasing the productivity of USF land and thereby enhancing the economic conditions of local landless *jhumia* people via afforestation and rehabilitating *jhumia* families.

The Rationale of Project Formulation

The landscape of CHT is hilly, comprising broken steep and rugged hills intermingled with gorge, streams and streamlets, cultivatable and

jhum lands. The whole 5,093 square miles of CHT is a watershed area, signifying the importance of afforestation in order to increase and maintain tree cover as an utmost necessity for this hilly region.

The livelihoods of the CHT people are based on cultivation and *jhuming* (shifting cultivation) in the 3,006 square miles of USF land. Due to repeated *jhuming* by the nomadic ethnic people, their age-old practice, the USF land was in the condition of losing almost all its topsoil. Repeated *jhuming* deteriorated the productivity of the land to such an extent that the interval of *jhuming* of 8 to 10 years reduced to 2 to 3 years, resulting in on-going accelerated damage to soil by increasing erosion. Consequently, *jhuming* practices exceeded the boundary limits of USF land and entered into Reserved Forest (RF). The rationality of the urgency of rehabilitation of *jhumia* families signifies the importance of undertaking the *jhumia* rehabilitation project.

Previously implemented, lesser effective projects inspired the vision for introducing the participatory afforestation and *jhumia* rehabilitation projects. Integrated efforts by many departments helping the *jhumia* families in different ways are emphasised in this project to enhance the sustainability of the implementation of settled farming practices as well as its implications.

Physical Targets

The physical targets, or goals, of this programme were two-fold. Firstly, afforestation of 55,000 acres (22,267.20 hectares) of USF land in Rangamati, Bandarban and Khagrachari districts of CHT under different forest divisions. Secondly, rehabilitation of 4,000 *jhumia* families (landless shifting cultivators) in different areas of USF land in the operational areas of afforestation. The programme includes allotment of land for each family to construct houses for their dwelling and for producing agricultural and horticultural crops and bamboo cultivation.

Participatory Goals

The participatory goal was to create a sense of participation among the rehabilitated *jhumia* families and implement the scheme properly through PF practices based on benefit sharing mechanisms. *Jhumia* rehabilitated villages would be established by allotting 5 acres (2.02 hectares) of land to each landless nomadic shifting cultivator (*jhumia* family). Necessary incentives and technical assistance would be

provided to participants for farming practices under different land uses. As well as being participants, they would work as labourers of the forest plantation established by FD. Definite benefit-sharing mechanisms were adopted. Both the plantation establishment by FD and the farming activities of the rehabilitated families in the settled areas would be governed by participatory processes, as illustrated in the deed of agreement between the participants and the participating agency, and in the model or technology described below.

Technology and Management Practices Adopted

Each family was provided with 2.02 hectares of land to be used in portions of 0.20 ha, 0.20 ha, 0.10 ha, 0.40 ha, 0.08 ha, 0.40 ha, 0.10 ha, 0.53 ha respectively, for household settlement and agricultural crops, bamboo and cane cultivation, pineapple, banana, lemon, jackfruit, guava, and miscellaneous crops. FD performed survey and demarcation of each plot, construction of the dwelling house, site preparation for planting and cultivation, supply of poultry, bamboo and cane plantation, supply of seeds for agri-crops, horticultural garden over 1.62 hectares and planting and maintenance activities up to 2 years including vacancy filling with different fruits and other species and the use of fertiliser and insecticides. Although the area and name of the species for fruit and miscellaneous species were specified, no definite spacing was mentioned in the model designed.

Later on, settled families would maintain their farms themselves. All the benefits from the farm would go to the farmers. Provisions also exist for rewarding farmers for good performance in raising crops in their allotted plots as well as in raising successful plantations.

Plantations of forest species (tropical hardwood, semi-hardwood and softwood species, such as *Chapalish*, *Chikrachi*, *Toon*, *Karoi*, *Garjan*, *Dhakijam*, *Pynkado*, *Teak*, *Gamar*, *Eucalyptus*, *Albizzia Molacan* and *Kadam* would be established by the FD in USF land near the rehabilitated villages. The settled *jhumia* families would carry out the afforestation works as wage labour, as well as being allowed to practice agro-forestry in the plantations. Moreover, to create a sense of participation, the *jhumia* families would be granted rights over plantations and forest produce as per signed agreements between the *jhumia* families and FD.

The responsibility of provisional selection of *mouzas* for afforestation and rehabilitation are by the Law Enforcing Agencies, District Administration, Chittagong Hill Tracts Development Board and Forest Department. District Administration and Law Enforcing Agencies selected the landless *jhumia* families.

Benefit Sharing Mechanisms as per the Deed of Agreement

The participating farmers would get all the benefits from the farming practices under different land uses in the rehabilitated plots. Additionally, they would work in the forest plantation for establishment and maintenance on behalf of the FD as wage labour and also would practice agro-forestry within plantations and receive all the benefits of agro-forestry as per the land allotted for agro-forestry to each farmer. Thinning would be carried out in the 10th, 15th and 20th years. In terms of benefits, 2.5 percent of the money obtained by selling the thinning products after deducting the transportation cost would be distributed among the participants. After clear felling in the 30th year and selling the produce, 1 percent of benefits would be distributed among the participants. A committee headed by the Divisional Forest Offices, with *Upazilla Nirbahi* Officer, a representative of the Zonal Commanding Officer, Union *Parishad* Chairman, *Mouza* Headman, Local Forest Range Officer, Local Union *Parishad* Member and Officer In-charge of Settlement as members of the committee, which would deal with benefit sharing, land allocation for afforestation and rehabilitation. In the case of any conflict or difference of opinion, the appellate authority would be the Chittagong Hill tracts Development Board or the equivalent Government Authority. The appellate decision would be the final.

The participating *jhumia* families' responsibilities include timely presence and work for nursery raising and plantation establishment as and when necessary, and performing all the required initiatives and activities to protect and maintain plantations from biotic factors in particular, and from other factors in general.

Impacts and Implications

Participation in forest plantation raising and protection would be ensured through settlement, giving participating farmers farm inputs for rehabilitated areas, incentives in the form of temporary employment as wage labour in plantation raising activities, allowing participants to cultivate under trees in the early stage of plantation and tree tenure via benefit sharing mechanisms in FD's forest plantation. Successful plantation establishment would result in the effective participation of rehabilitated farmers in planting work, maintenance and protection.

Landless *jhumia* families would be rehabilitated and this would bring about their socio-economic upliftment. Increased income would

bring changes in the living patterns of rehabilitated farmers. Sale proceeds from forest produce would recover the cost of the project as well as contribute to government revenue earning. Again, the economic condition of farmers would further improve via employment as wage labour, and additional food and money by practicing agro-forestry in both plantation and rehabilitated villages. Increased raw material production in the farms and plantations would increase the wood-based and cottage industrial products.

Nomadic shifting cultivators would be settled and ultimately the major causes of land degradation would be minimised. Forests as well as agricultural products of the region would increase and with the increase of vegetation cover the soil erosion in particular, and environmental degradation in general, would be minimised. As a result, the productivity of land would improve. The hazard of flood and potential threat to the Kaptai Hydro Electric Project due to rapid filtration would also be reduced.

Afforestation and Settlement in the Unclassed State Forests of Chittagong Hill Tracts (2nd Phase)

This is the second phase of the above titled project scheduled for implementation from 1990-91 to 1994-95. Both the first and second phases have the same objectives in terms of technological and management practices, and therefore the second phase may be regarded as the continuation of the first phase without any significant modifications. The objective was afforestation of USF land and rehabilitation of shifting cultivator's families to increase the productivity of the USF land and thereby enhance the economic condition of the local people. Long rotation and pulpwood plantations would be established and raw material supply for wood-based industries would increase. The economic condition of the settled shifting cultivators would be uplifted and eventually the environmental condition of USF land would improve.

The Rationale of the Project Formulation

The rationale was similar to the project Integrated Afforestation and Rehabilitation of *Jhumia* Families in CHT project, as cited above. Increased tree cover and environmental improvement as a whole were the objectives of the national fourth Five-Year Plan for the forestry sector. This project was formulated according to the objectives of the said national forestry sector plan. Increased tree cover would improve the environment of the region and the settlement of *jhumia* families

would improve the socio-economic condition of the individuals as well as the wider locality, particularly the operational area of settlement and its nearby surroundings.

Physical Target

During the project period, 23,474 acres of USF land would be afforested covering the three hill districts. Along with the afforestation programme, 550 landless poor shifting cultivators (marginal families) would be settled in the three hill districts providing 5 acres of USF land to each family, forming rehabilitation villages.

Participatory Goal

The participatory goal was to create a sense of participation among the rehabilitated *jhumia* families and implement the scheme properly through the active involvement of settled farmers in improved farming practices. *Jhumia* rehabilitated villages would be established by allotting 5 acres (2.02 hectares) of land to each landless nomadic shifting cultivator (*jhumia* family). Necessary incentives and technical assistance would be provided to participants for farming practices under different land uses. Participants would participate in raising plantations in the USF land by the FD with the incentive that they would be allowed to cultivate agricultural crops in the plantation area, though money for their labour in raising forest plantations would be provided to them as well.

Technology and Management Practices Adopted:

The model is similar to the model applied in the Integrated Afforestation and *Jhumia* Rehabilitation project, i.e. each family would be provided with 2.02 ha land to be used in segments of 0.20 ha, 0.20 ha, 0.10 ha, 0.40 ha, 0.08 ha, 0.40 ha, 0.10 ha, 0.53 ha, respectively for household settlement and agricultural crops, bamboo and cane cultivation, pineapple, banana, lemon, jackfruit, guava, and miscellaneous crops. The participating agency would provide land development, survey and demarcation of each plot, construction of the dwelling house, site preparation for planting and cultivation, supply of poultry, bamboo and cane plantation, supply of seeds for agri-crops, horticultural garden over 1.62 hectares and planting and maintenance activities up to 2 years including vacancy filling with different fruits and other species and the use of fertiliser and insecticides. Though the area and name of the species for fruit and miscellaneous species were specified, no definite spacing was mentioned in the model designed. Settled families would enjoy the farming benefits. After two years, the

overall responsibility of maintaining the farm would be automatically vested to the settled farmers. Subsistence allowances would be provided to the farmers for three consecutive years. Moreover, depending on the availability of the various agencies involved in various development activities in CHT, the rehabilitated families would be allowed to be involved in them, so that their income generation would be diversified.

Afforestation of long rotation species such as Teak, *Garjan*, *Chikrashi*, *Toon*, *Dhakijam*, *Champfuful*, *Chapalish*, *Pymkado*, *Jarul*, *Gamar*, etc. would be done. The species for short rotation would be *Akashmoni*, *Gamar*, Pine, etc. The settled *jhumia* families would work as labour in plantation raising activities, such as survey and demarcation, jungle cutting, burning, debris collection, re-burning, stake collection and staking (6" x 6"), pit making (1.5" x 1.5" x 1.5"), application of fertiliser, *Arhar* sowing, planting of seedlings at 6" x 6" spacing, weeding, etc.

Jhumia families to be rehabilitated and the selection of *mouzas* for afforestation and rehabilitation would be available by the Law Enforcing Agencies, District Administration, and Forest Department. The protection of the rehabilitated *jhumia* families, forest employees and other workers would be the responsibility of the Law Enforcing Agencies.

Benefit Sharing

Settled *jhumia* families would perform farming practices in the area provided to them. Initially, all assistance would be provided by the project as incentives, including subsistence allowances in the initial years of project period. 100 percent of benefits would go to the farmers. Additionally, participants would work in the FD plantation area as wage labour. Again, as an incentive along with wage payments, participants were also allowed to cultivate agri-crops in the plantation area in the early years and also in the subsequent years as long as it remained feasible. All the agri-products would be the property of the concerned farmers. In this project, no benefit sharing mechanism was adopted for thinning produce, or for final harvests, and accordingly, protection of the plantation was also not vested to the settled farmers.

Impacts and Implications

Avenues for employment of the local ethnic people would be opened through the involvement in the forest plantation raising work as labour as well as getting the opportunity to practice agriculture in the plantation area for as many years as feasible.

Landless *jhumia* families would be rehabilitated and this would bring about socio-economic upliftment through increased farm income. This would bring positive change in the living pattern of rehabilitated farmers. Again, increased raw material production in the farm and plantation would increase the wood-based and cottage industrial products.

Shifting cultivation, the major cause of land degradation, would be minimised. Forests as well as agricultural products of the region would increase. The ultimate impact would be environmental restoration and improved living conditions via practicing technologically-guided land use practices.

Afforestation and Rehabilitation of Jhumia Families in the USF and Reserved Forest Land of CHT (3rd Phase)

Bangladesh Forest Department designed and implemented this 3rd phase of the project from 1995-96 to 2001-2002. The halting of environmental degradation of USF land in CHT via participatory afforestation and rehabilitation of nomadic *jhumia* families were the main objectives.

The Rationale of Project Formulation

The rationale was similar to that of the projects Integrated Afforestation and Rehabilitation of *Jhumia* Families in CHT and Afforestation and Settlement in the USF Land of CHT. This is a continuation of the second phase (the Afforestation and Settlement project). The second phase ended in June 1995 after raising 8,605 hectares of plantation and rehabilitating 350 *jhumia* families. The Forestry Master Plan 1993, prescribed goals to raise long- and medium-rotation pulpwood plantations that are incorporated in this project. The project also coincides with the main two objectives of the Forestry Master Plan; increasing tree cover and amelioration of the natural environment. The Forest Policy 1994 also provided similar direction. Accordingly, this third phase was a modified technological intervention based on the latest forest policy formulated on the basis of the suggestions given by the Forestry Master Plan.

Physical Targets

The project was designed to establish tree cover in USF land and RF areas in the three hill districts, Rangamati, Khagrachari, and Bandarban. Here the physical targets are of two-fold also; firstly, afforestation of 11,060 hectares (7,820 hectares medium-rotation and the rest long-rotation) in USF and RF, and secondly, rehabilitation of

350 *jhumia* families on USF land. Programmes include allotment of USF land for each family for farm land use as forestry, agro-forestry, agriculture and homestead.

Participatory Goal

The participatory goal was similar to the abovementioned projects. The system of land use as well as incentives and benefit-sharing mechanisms to involve the participants in effective participation in forestry practices were somewhat different, but the ultimate goal of participation was the same.

Governing Strategy

Selection of landless *jhumia* families was performed by a committee headed by the concerned Divisional Forest Officer. The other members were *mouza* headmen, Union *Parishad* chairmen, representatives of local government, the concerned army unit, and the concerned Deputy Commissioner. The Forest Office under the concerned Forest Division was to implement the afforestation and rehabilitation work through participatory processes.

Technology and Management Practices Adopted

Jhumia families would be rehabilitated in 14 centres/villages. In each village, 25 families would be settled. Each family would be given 2.02 hectares of USF land which would be utilised for homestead, agri and vegetable (0.20 ha), fruit garden (0.40 ha), Teak plantation (0.81 ha) and *Gamar* plantation (0.61 ha). Fruit species would be lemon, banana, guava, jackfruit and pineapple. Survey and demarcation of land, house construction, site preparation, planting forest and fruit species and fertiliser application, agricultural inputs, and 25 chickens and 5 cocks for each family would be provided. Weeding, vacancy filling and other maintenance activities would be performed by the project agency for 3 years. In addition, allowances in 3 instalments (total Tk. 2,100) for each family, one ring well for common use, construction of one check dam with netting and sluice gate for water storage and fisheries would also be provided. One member from each family would receive a two-day training on SF, with a participation allowance of Tk. 100 per participant. In this third phase, the spacing for forest, fruit and other species, and the number of species required in accordance with the spacing mentioned, were specified in the model designed. These are, for forest species, 2m x 2m (2020 no. Teak and 1515 no. *Gamar* for 2 acres and 1.5 acres respectively); for lemon and banana, 5m x 5m (40 no. lemon and banana for 0.25 acre); for jackfruit, 10m x 10m and for pineapple, 2m x 2m, (10 no. Jack fruit and 238 no. pineapple in the

same 0.25 acres as mixed-cultivation); for guava, pabelo and spices (*tejpata*), 7m x 7m, (20 no. guava and 20 no. pabelo and *tejpata* in the same 0.50 acres as mixed-cultivation).

Plantation of long- and medium-rotation forest species would be established. Species for long rotation would be Teak, *Garjan*, *Chikrashi*, *Dhakijham*, and for medium rotation the species was *Gamar*. Rehabilitated *jhumia* families would work for plantation raising and maintenance activities as wage labour. Moreover, these families, as well as other local people selected as participants in the plantation, would be allowed to cultivate in the plantation in the early stages. Participants would get rights over plantation and forest produce as per signed agreements between the participants and FD in a benefit sharing mechanism.

The responsibility of selecting participants was vested to a committee headed by the concerned Divisional Forest Officer, including members of local leaders, local law enforcing agencies and other local government organizations as approved by the concerned Deputy Commissioner.

Benefit Sharing Mechanisms as per the Deed of Agreement

Each rehabilitated *jhumia* family would be provided with 2.02 hectares of land with the intention that they would reside there and raise plantation of forest, fruits and vegetables. They would also provide labour in the plantation of the project.

The forest plantation would be raised using SF mechanisms and the participants and FD would receive 30 percent and 70 percent of the final harvest respectively. The break down of the 30 percent of benefits was: ethnic king- 5 percent, local government/council- 5 percent, headmen- 5 percent, and the participant- 15 percent. The participants would get 100 percent of the 1st thinning produce, and 50 percent of the 2nd and 3rd thinning. The FD would fix rotation. The plantation programme would be undertaken in consultation with all the 5 parties involved. In selecting participants, there were no gender specifications in the policy. Technical direction and overall supervision was the responsibility of the FD and all the other parties were bound to obey to that. The participating farmers would be responsible for fire and theft protection of the plantation as well as guard it from damage by cattle grazing.

The appellate authority for any dispute in benefit sharing and other issues as stated in the deed was the Minister/Secretary of the Ministry of Environment and Forests, and their decision would be final.

Impacts and Implications

Impacts and implications envisaged were more or less similar impacts as those in the two abovementioned interventions. Environmental improvement would occur through proper land use practices as well as the socio-economic upliftment of the *jhumias* and local people involved in the project as participants. Rehabilitation of nomadic *jhumias* would reduce *jhuming* practices and by increasing tree cover, soil erosion would be minimised.

Proper and sustained coordination among the agencies of participation would be ensured, which would result in the optimum protection and maintenance of the plantation established. The only difference is that the system was modified, on the basis of the performances evaluated, for better performance to be achieved in the future.

Forestry Sector Project

This was a nationwide project covering both the plain and hill regions implemented from 1997-98 to 2003-04. In CHT, afforestation and *jhumia* rehabilitation in the RF and USF lands in Bandarban district was undertaken via a participatory approach on the basis of benefit sharing mechanisms. The primary objective was to increase the tree resource base of the country by reducing destruction of resources, as well as generating new resources by rehabilitating 460 *jhumia*/ethnic families on 920 hectares of degraded USF/RF land in Bandarban district.

The Rationale of the Project Formulation:

Population increase augmented forest destruction because of enlarged demands for forest resources. Due to higher demands than production, resources had decreased significantly. As a result, the Forestry Sector Master Plan emphasised the need for people-oriented forestry, and policy formulated thus also incorporated the same. Moreover, the past experiences of people-oriented programmes had also indicated that it was time to undertake large-scale PF programmes in such a way that people would directly benefit from forests. To ignite such a situation required active tree growing activities and management on a large-scale with the general objective of environmental stabilisation via forestry and agro-forestry development in degraded forest lands. In Bandarban district of CHT, an additional aim of the programme was afforestation of degraded RF and USF lands by settling local people in and around forests and rehabilitating *jhumia* families with the same rationale as indicated in the abovementioned interventions in CHT.

Physical Target

In CHT, only Bandarban district was included in the project. The project was designed to establish tree cover in USF and RF areas. Here, the physical targets were of two-fold also; firstly, afforestation of 920 hectares of USF and RF, and secondly, rehabilitation of 460 *jhumia* families. For rehabilitation, 2 hectares of land would be allotted to each *jhumia* family (ethnic family/forest villagers who have until recently been practicing shifting cultivation) for raising silvi-/agri-/horticulture farms. Water supply would be ensured for the farm as well as for participants' daily needs by developing watershed management measures.

Participatory Goal

The participatory goal was similar to the other FD projects. The system of land use and the planting model were somewhat different. Benefit sharing was enhanced in this project as compared to the other projects for more effective participation. The plantation pattern prescribed in the model was to be followed with participation of ethnic people.

Technology and Management Practices

Land for farm development was to be selected from both USF and RF land on gentle slopes and foothills. Each family was provided with 2 hectares of land, out of which 0.1 hectare was designated for homestead and the remaining 1.9 hectares for silvi-/agri-/horticultural gardening. If existing villages in the proximity were selected, the whole 2 hectares was to be used for silvi-/agri-/horticultural gardens. The participating household will get usufructuary rights on the assigned forest for the rotation period.

Alley cropping with a 15-18 metre contour alley was prescribed. Trees were to be planted with 2m x 2m spacing of 2-3 rows in each strip. In the alley space, 1.5 metre wide hedgerows would be developed. Regular trimming of contour hedgerow and mulching, green manuring was to be done. In the 5 metre space between two hedgerows in the alleys, agricultural crops that required less intensive land preparation would be cultivated. Scattered in the farm, along the boundary or with hedgerows, long-term fruit trees would be grown.

Benefit Sharing Mechanisms as per the Deed of Agreement

Selected *jhumia* families or villagers were to be provided with land for raising silvi-agri-horticulture plantations including forest, fruit and

vegetables and low-soil dependent agro-crops. The selected participants could perform plantation raising activities as paid labourers.

Plantation would be raised using SF mechanisms. FD and participants would each receive 45 percent of the 2nd thinning and final harvests. The remaining 10 percent would be kept in a Tree Farming Fund (TFF) for expense future plantations. This fund would be governed by strict rules.

FD was to engage participants in different planting and harvesting practices, etc. Technical direction and supervision was the responsibility of the FD, while the plantation was protected and cared for by the participants. The deed agreement was to be valid for 10 years, and participants should keep 80 percent of stock in the plantation to save the deed of agreement from cancellation.

Impacts and Implications

The shifting cultivation system cannot meet the growing needs of the rapidly increasing population in CHT. A productive farming system will be provided by this planting study model adopted for farming practices in allotted land by the selected participants. The TFF will obviously impact on the sustainability of the system. Yearly, short-term and long-term harvestable production will be obtained from such plantations and thereby provide a continuous income stream that will impact on participants' poverty reduction and social wellbeing. At a glance, the project impacts and implications will be similar to those of the other FD projects and also incorporate the related determinants and sustainability factors through the introduction of TFF and a farming system that can be adopted as an alternative to *jhuming*. The provision for practicing that system on the degraded RF of CHT will help in saving the remaining adjacent RF.

Upland Settlement Project (Phase 1)

This is a CHTDB project implemented over the years 1979-80 to 1993-94 with financial assistance from ADB. The project was implemented in the Chengi and Myini valleys of Khagrachari district and Kassalong valley of Rangamati district, with the objective of settling landless and marginal farmers by increasing horticulture and rubber plantations in the hill region. This would raise farm income of the participants, rural employment would be created, local people's participation would be enhanced.

The Rationale of Project Formulation

The ethnic people of CHT are more or less dependent on *jhum* cultivation for their livelihoods. *Jhum* practice is periodical in nature and due to rapid increase of population the fallow period for *jhuming* decreased abnormally. As such, due to increased soil erosion and decreasing soil fertility, the *jhumias* are gradually becoming poorer and maintaining their families is becoming difficult.

CHTDB was created in the year 1976 with the aim to give special attention to this hill region. In order to provide direct socio-economic benefits to the selected farmers, CHTDB formulated the Upland Settlement Project, 1st Phase.

Physical Target

200 landless *jhumia* families in the Chengi, Myani and Kasslong villages were the targeted farmers. Each family was to be provided land for horticulture farming and establishing rubber plantations. The allotted land was to be given to the farmer as leasehold tenure by providing land records and this record generating work was to be done by the project agency. House building, horticultural garden development, and seedlings, fertilisers, pesticide, etc. for and establishing rubber plantations were provided as part of the project. In this way, 80,000 acres (32,388.66 hectares) of rubber plantation and 4,000 acres (1,619.43 hectares) of horticulture gardens would be established and 2,000 *jhumia* families would be settled, giving up their traditional *jhuming* practices.

Participatory Goal

The participatory goal was to involve *jhumia* farmers in settled farming systems. This would enhance their participation in development activities.

Technology and Management Practice Adopted

Each family was provided 2.53 hectares of land for settled farming, out of which, 1.62 hectares was for rubber plantation, and the remainder for house plot, horticulture and bamboo. Each family received monetary assistance in the form of loans and services of technical and input supply, etc. Settlers were trained by project management in all the activities of rubber plantation including the methods and standards of tapping. Basic facilities, like water supply, medical and school facilities, and marketing facilities for produce were provided by the project. The loan for rubber planting provided to the settlers was to be

replayed by the settlers by instalments within 20 years from the start of tapping rubber.

Committees were formed for law/site selection, family selection and project implementation, as prescribed in the project documents. On completion of project, a Central Management Unit (CMU) would be formed to organise all respects of the continuing work in the project villages. Settlers' families would be active members of the CMU.

The rules and regulations for maintaining rubber gardens and the collection of latex, processing latex in the factories, wage permits for the workers, distribution of shares of money from sales of raw rubber and product form were prepared by CHTDB and approved by a government representative from the local administration.

CHTDB provided working tools and household utensils to the farmers. For horticultural gardens, short-, medium- and long-term species were cultivated and planted. Among them, a specified amount of cash crop seeds and vegetable seeds were provided for short-term income generation. Medium-term forest trees, and suckers and seedlings of banana, pineapple and papaya, and long-term fruit tree seedlings, grafting and suckers of jackfruit, *amra*, litchi, coconut, betel nut, *mango*, lemon, pamelo, *bel*, *kul*, black jam, teak stump and *baryala* bamboo would be provided with necessary technical help. Planting techniques followed were similar those followed in the FD project villages.

For rubber plantations, rubber seedlings and necessary technical help and other inputs would be provided. Definite planting models incorporating specific spacing were provided (9" × 18" spacing). Planting and silvicultural operation were to be carried out as per the requirements of plantation establishment with rubber tree growing and maintenance.

Benefit Sharing Mechanisms

All the benefits arising out of horticultural gardens would be enjoyed by the participants. Benefits arising out of rubber plantations would also be enjoyed by the participants, after deducting the yearly instalment payment for loans provided to them for raising the plantation. After 20 years, i.e. after the completion of loan payments (including 5 percent interest over the 20-year period), the participants will enjoy all the benefits arising out of rubber plantations.

Impact and Implications

The impacts and implications were similar to the FD projects; the *jhumia* families would be settled, nomadic *jhuming* would be reduced,

the socio-economic condition of the families would be improved. Due to settled farming, the micro-environment of the village would be improved by planting trees covering the denuded lands, thereby decreasing soil erosion and increasing soil productivity. The rubber trees will provide income generation within a short time span, and in the long run (after loan repayment completion) each family will get a bulk amount of income from rubber sales. The predicted average annual income per family from 4.00 acres rubber plantation will be Tk. 45,000 for rubber-tapping wages and Tk. 60,000 for their share of sale proceeds.

In this way, the socio-economic impacts of the project will also manifest in other forms in and around villages. The people from the surrounding villages will be encouraged towards settled farming by horticulture and rubber garden establishments. Rubber production in the country increase vastly, along with other ecological benefits.

Upland Settlement Project (Phase 2)

This project of CHTDB was the continuation of the 1st phase of the Upland Settlement Project. Implementation started in the 1994-95 fiscal year and is still continuing with the same objectives to improve the socio-economic well being of the people of this region as well as to ensure proper land use. The project so far has covered the Matiranga *Upazila* of Khagrachari district and Sadar *Upazila* of Bandarban district.

The Rationale of Project Formulation

This project was the result of successful completion of the first phase of the project. The Bangladesh government and ADB felt that the continuation of the first phase of the Upland Settlement Project should be undertaken in a second phase with the same objectives as those of the first phase. In the second phase, the programme was taken to Sadar *Upazila* of Bandarban district. Bandarban district was excluded in the 1st phase, and therefore the second phase included Sadar *Upazila*, as the area was accessible and suitable for the said programme.

Physical Target

The physical target was to rehabilitate landless families by providing them settlement in the allotted land in a similar process as to that of the first phase. The target was to rehabilitate as many landless families as the budget provision allowed. 500 families under Sadar *Upazila* of Bandarban district and 500 families in the Matiranga *Upazila* of Khagrachari district had been rehabilitated in the 1994-95 and 1995-96

fiscal years, providing similar socio-economic facilities as those mentioned in relation to the first phase.

Participatory Goal

The participatory was goal similar to the first phase of the project; to ensure and enhance people's participation in development activities for food and ecological security, socio-cultural integrity and socio-economic upliftment of the ethnic people of the CHT region.

Technology and Management Practice Adopted

Similar technology and management practices were adopted in this second phase of the project as to those that were in place in the first phase. 5.25 acres (2.13 hectares) of land was allotted to each family, out of which 4.0 acres (1.62 hectares) was for rubber plantation and the remaining 1.25 acres (0.50 hectares) for homestead and horticulture gardening. The spacing for rubber trees was set at 9" × 20" (that was 9" × 18" in the first phase).

Benefit Sharing Mechanisms

Similar benefit sharing mechanisms to those in the first phase were adopted. Participants were to enjoy all the benefits arising out of the horticulture gardens and the loan money was to be recovered from the rubber plantations by instalment payments over a 20-year period.

Impacts and Implications

Similar impacts and implications as to those in the first phase were envisaged. The project employed a participatory family system approach resulting in food and ecological security, preservation of socio-cultural integrity and development of socio-economic wellbeing of the ethnic people of CHT. Large scale afforestation of denuded hills with rubber trees would also improve the environment and provide a bulk amount of income to participants. Agro-forestry promotion would increase farm income. Support services for crop production would enhance crop production as well as land productivity.

Village Common Forest (VCF) Project

This is a project of Tayanga, a NGO working on CHT since 1994 on major issues, such as environmentally equitable socio-economic progress and indigenous culture of CHT, particularly with rural and disadvantaged communities. Starting in 2002, the VCF Project was undertaken with the general goal of strengthening the livelihood security and organizational skills of VCFs, as well as protection of village forests and promotion of watershed measurement in the region.

The VCF is a rights-based approach in indigenous forestry in CHT that includes objectives of enhancement of livelihood security through sustainable income-generating activities as well as advocacy on tenure, livelihood, environmental security, ecology and bio-diversity. The project covered 12 villages of Rangamati district, with the same activities in all the targeted villages. It was financed by DANIDA.

The Rationale of Project Formulation

24 percent of the CHT land area is government RF where there is a form of land rights and settlements are formally recognised. The remaining land is Unclassed State Forests (USF) that is administered not by FD, but by District Civil Administration. VCF comprises of the land with the most concentrated forest cover in these areas. Due to rampant deforestation in RF and other parts of the region, village forests are also degraded. The major cause of deforestation is population rise, which in turn leads to growth of settlements and the conversion of forest lands into agricultural lands. Moreover, both legal and illegal felling of timber in recent times is another important factor. The resultant deforestation caused resource constraints that made local communities devise newer and more sustainable modes of natural resource management.

Drawing upon indigenous and traditional methods of forest fallow and *jhuming*, the necessity to declare a common area in villages a common forest for the communities was clear. For demarcation, protection, management and development of the village forests, the VCF project was undertaken and executed through community participation. Village people participating in such activities are encouraged to be aware about their legal rights and livelihood development and security through advocacy and other assistance from the project. Through project participation, the village community people are managing the village forest as well as doing settled farming on their own land in the village using improved farming practices in order to strengthen livelihood security and lead to socio-economic upliftment. Physical Target

12 village common forests in Rangamati district will be primarily targeted for project execution, with the ultimate goal of reaching 38 villages in the three districts of CHT. Participatory village community organizations will be formed to manage such forests, a training module will be written in the first year, and training, advocacy and awareness building activities will be carried out targeting both active participants and general people from the villages. 38 village maps will be

produced, village forest area will be increased by 50 percent and 2,500 participants will be trained.

Participatory Goal

Effective participation will be encouraged and ensured via undertaking training programmes through VCF committees, conferences, linkage development, incentives, etc.

Technology and Management Practice Adopted

Activities of the project will be executed by a project implementation committee. The committee will take advisory assistance from the specialists nominated by the committee. In each village, a VCF committee will be formed. Work will be carried out according to a yearly plan of settlement, boundary demarcation, map preparation, advocacy for ethnic rights, information dissemination, training, workshops and conferences, building saving mentality, income generating activities, etc. Participants will be awarded and encouraged in forestry development in common forest areas as well as in their own cultivable land for livelihood and income generation. The plantation techniques will be similar to the silviculture practices as followed by FD, CHTDB and NGOs, i.e. a combination of traditional and improved systems of cultivation. The project will motivate the villagers through rights-based approaches and the villagers, through their own initiative and participatory approaches, will protect and develop the VCF as well as perform income-generating farming practices and other related affairs.

Benefit Sharing

Participants will enjoy all the benefits arising out of forestry/farming practices and participatory project activities undertaken in the project.

Impacts and Implications

VCF will be protected, preserved and developed. Participants' awareness about land rights and pro-poor growth related matters will be strengthened. Access to education and income-generating activities for village communities will be facilitated. Their livelihood security will also be facilitated and manifested via different income-generating activities including settled farming practice. As a result, the dependency on traditional nomadic *jhuming* practices will be reduced. Forest cover will increase and the ecological condition of the area will be improved.

Horticulture Development Project

This is a development project of Caritas, a charitable organization established by the Catholic Bishops' Conference of Bangladesh, in the

Chittagong region, especially for the ethnic people of CHT. The project began in 1990-1991 and implemented was in phases, with three years in phases 1, 2 and 3, from 1990-91 to 1999-2000. The duration of the fourth phase was four years, commencing from 2000-2001 to 2003-2004. The project was implemented through the funding of catholic sources from France. It targeted the underprivileged hill people who are solely dependent environmentally hazardous *jhum* cultivation and affected by gradual production decline. The project targeted mostly sub-migrant people with the objective to develop environmentally friendly, sustainable, improved farming practices for developing the livelihoods of the ethnic families by giving up traditional *jhuming*. Socio-economic improvement of the targeted ethnic families was to be achieved through profitable, creative co-ordinated programmes, and by helping the families in obtaining land allotments and land rights.

The Rationale of Project Formulation

Traditional *jhuming* is the means and nature of livelihood of the ethnic people of CHT. They generally do *jhuming* in a particular hilly place for a continuous 2-3 years and then leave the place. As a result, soil erosion occurs and the overall environment deteriorates, until gradually the deterioration of the environment in the whole CHT has accelerated. This project was undertaken by Caritas in order to supplant this traditional *jhuming* practice by introducing environmentally friendly permanent farming systems, and build awareness through training and motivational programmes. Initially adapting and implementing the project for a 3-year period, the project was continued in phases 2, 3 and 4 with similar objectives and activities, with the intention to spread the project activities in probable accessible areas of CHT.

Physical Target

Sub-migrant inhabitants in existing villages were the targeted farmers. Phase-wise, the targeted numbers of farmers were 193, 157, 100 and 500, in phase 1, 2, 3 and 4 respectively. Targeted areas covered under gardening were approximately 965, 785, 500 and 2,500 in phase 1, 2, 3, 4 respectively. Training and awareness building activities and input supply for short-, medium- and long-term cultivable species were carried out. Composed fertiliser preparation for farming use for each family was also incorporated into the project programme.

Participatory Goal

Active participation of the targeted farmers was to be ensured through farmer group formation and holding meetings and other related

coordinated efforts, frequent linkages and communication visits by project agency personnel and providing loans as incentives, etc.

Technology and Management Practice Adopted

Poor people with livelihoods based on *jhuming* and having an area of at least 3 acres of vacant land in his possession as lease/allotment/under possession/possession under process may be selected. Farmer groups will be formed of at least eight farmers. Group meetings will be held after 15-day intervals. Each group will maintain a bank account and all the members of the family will contribute monthly savings as decided by the committee.

Mixed plantations were to be established in the hills. Short-, medium- and long-term timber/fruit seeds/grafting are to be planted. Environmentally friendly species are to be given preference in selecting species for plantation establishment. Planting models supplied by the project must be followed by the farmers. In homestead and surroundings, acacia, papaya, banana, pineapple, *bosak*, and summer and winter seasonal vegetables will be cultivated as short-rotation crops. For medium- and long-rotation plantations, the species are (1) *gamar*, guava, *sharifa*, *shofeda*, *amloki*, *ulot kombal*, *shajna*, and (2) teak, *chupalish*, *korie*, *champa*, *mahagini*, *garjan*, jackfruit, olive, *kalijam*, mango, litchi, mandarin, coconut, *arjun*, *neem*, *tejpata*, etc. Nurseries are to be established in a suitable place in the village, considering ease of supply and marketing. Nursery input supply and training, technical help, and loans without interest will be provided for nursery raising.

Environmentally friendly farming systems will be followed. Farmers will be encouraged to use compost fertiliser, organic fertiliser, farming residual fertiliser, etc. and co-ordinate pest management. Local agricultural technology and traditional knowledge use will also be encouraged and biodiversity will be conserved.

Activities will be monitored and evaluated by the project agency from time to time, according to prescribed schedules and procedures.

Benefit Sharing

Benefits arising out of project farming activities will be enjoyed by the participating farmers. In phase 4 of the project, 7 percent of contributions are to be paid by the farmer.

Impacts and Implications

Targeted farmers gave up *jhuming* and will be involved in settled farming, and in this way, vacant and poorly productive land came

under cultivation. Homestead horticulture gardens were created. Raising of seedlings in the nursery, compost and fertiliser preparation and integrated pest management came into practice. Vegetable and economic crop production increased and livestock production rose. The overall income of the farmers' families increased notably. Project staff helped the ethnic families in obtaining land records, raised awareness about their human rights, as well as living legally with their families on their own land. Through coordinated efforts, the ethnic people's socio-economic conditions improved. They organised in groups and became self-sufficient. Inter-coordination among families was established.

Sustainable Hill Cultivation Programme

This was a pilot project of NGO Jabarang, implemented from August 2003 to July 2004. Implemented only in Khagrachari district, the objectives of the project were to contribute to poverty reduction via bridging economic stability of *jhumias* through awareness building for cultivating in hills using sustainable hill cultivation systems, helping the *jhumias* by introducing short-, medium- and long-rotation cultivation procedures, and encouraging environmentally friendly and sustainable hill cultivation. This will ultimately help contain the CHT region's environmental degradation and help to sustain its balance.

The Rationale of Project Formulation

The livelihood basis of the majority of the people in CHT is *jhuming*. Due to rapid population growth and land acquisition by government agencies for different purposes, the available land for *jhuming* decreased. *Jhuming* is now not profitable due to the unavailability of adequate of land for *jhuming*. There was no alternative cultivation method, and therefore *jhumias* are continuing *jhuming*, even whilst experiencing loss. FD and CHTDB had undertaken projects to stop *jhuming* and for the development of *jhumia* people, but failed to establish any alternative to the *jhuming* system.

Taking into account these realities, the NGO Jabarang carried out action research from 1997. On the basis of their research, Jabarang found and came to the conclusion that if hills are cultivated in a sustainable system, that would be more profitable than the present *jhuming* system. In order to implement this knowledge obtained through their research, with direct involvement and participation and also for further studies, Jabarang began this Sustainable Hill Cultivation Programme. The project would play an important role in the development of the socio-economic condition of the farmers

involved in the project. Through experimental cultivation for years at a time, it was proved that properly following this system, the hill people would be able to continue cultivation sustainably and scientifically for the whole year and would be able to enjoy the benefits continuously.

Physical Target

30 families from 3 villages in Sadar and Dighinala *Upazilas* of Khagrachari district were the targeted people. Jabarang trained participants in the new cultivation system, distributed of short-, medium- and long-rotation species for free, provided required technical help, coordinated and established linkages among government and non-government organizations, enhanced communication among the villages under the project, and empowered and increase the capacity of participating farmers.

Participatory Goal

The participatory goal was to ensure people's participation in the project through the creation of a sense of participation and a participating trend towards knowledge exchange and networking. Strategically, implementation of participatory learning procedures were based on the model or technology described below.

Technology and Management Practices Adopted

In the traditional allotted *jhumia* lands, whatever the allotted amount of land may be, farmers will continue cultivation for years together without any fallow period for cultivation. A family will be self-sufficient by cultivating short-, medium- and long-rotation crops, such as grain and vegetable crops, fruit crops, and fruits and timber trees respectively. By following the rotation period in the 1st year, short-rotation crops will be cultivated. In the second year, medium-rotation crops of 5 to 8 years and from the 5th year to the 10th year, long-rotation crops can be planted. In the interim periods of harvesting, a *jhumia* farmer can continue producing short-rotation crops. Cultivation and maintenance of crops will be carried out as per *jhuming* practices in CHT. The only exception will be that cultivation, maintenance and harvesting of crops will be continuously done in the same land in continuity for years together and thereby managed accordingly through participation among the farmers and the project agencies. Specific strategies and management measures that will ensure effective participation will be undertaken. Composed fertiliser will be produced in a stack or pit system near the homestead areas and land by the side of paddy fields for using the *jhumia* field.

Impacts and Implications

The project would be familiar as a model and it would encourage the nearby villagers to adopt this modern cultivation system. This impacted by changing the personal and family life of the farmer as well as increasing their economic solvency. The project indicated the identification of seasons for cultivation and required planning as well. Planting of species in a planned way and composed fertiliser making procedures were learned from this project also.

The project provided a permanent income source for participants from short-, medium- and long-rotation crop production in a continuous way. Farmers understood the idea and difference between chemical fertiliser and bio-fertiliser and its production system, modern planting techniques, awareness about the importance of planned cultivation in hills and participation. In this way, the method was established as a model for hill cultivation as this technology can be applied in any hilly land or other area.

Conclusion

PF is now present all over the world as a remedial strategy to decelerate and halt forest degradation (deforestation, encroachment, etc) causes due to non-cooperation as well as adverse activities by forest dwelling people and communities. Variation in the nature of PF and the strategies for its implementation are widely visible in the different regions of the world. This variation is more prominent in the highly-populated continent, Asia, and more particularly in the South Asian countries, due to high and rapid increasing trends in forest destruction. Increasing population that exerted continuous pressure on forest resources coupled with the impacts of long practiced people-alienating management measures through the imposition of policies, rules and regulations, as outlined in Chapter 2, are the major causes in behind this extreme rate of forest destruction. Depending on the nature and magnitude of destruction due to varied levels of hostility towards forests created in the forest dwelling communities, the nature, concept and magnitude of PF interventions manifested, footed in locality-based systems and surrounding situations. However, the common PF concept is people's participation in forest management and benefit sharing.

The general concept of PF evolved from the idea that whenever the degraded or destroyed forests cannot be rehabilitated by any means following the traditional method of forest management, they can be reforested, at least to some extent, in other means that involve local people in management and benefit sharing arrangements. People or

communities living in and around forests are typically a poor, landless, vulnerable section of a population. PF goals can be undertaken towards rural development and poverty reduction by improving livelihoods and lifestyles of the PF farmers whilst keeping in harmony with nature. For this, a change from traditional approaches to participatory approaches is a necessity.

In PF, the strategy for both the PF agency and farmers' participation can logically be formulated considering the footings in specific social settings, that also depend on a complex system of relationships and institutions that are influenced by the surroundings. However, in PF the emphasis is given to a system that depends on many variables: land and tree tenure, the role of forestry organizations and policies, the role of local organizations, social relations and power structures, market opportunities, the role of donor agencies, etc. PF concepts evolved for re-addressing forest degradation were triggered and intensified as a result of the severe destruction of global forests, as observed by studies and inventories carried out by FAO, WB, and other world institutions, have now notably spread to all the continents of the world. PF came into operation in Asia because its dense population and the more intensive forest destruction occurring in this continent, as in the past people were ignored in relation to managing forests. Consequently, intense population increase combined with conventional forest management practices caused more intense forest destruction in South Asian countries. Among the South Asian countries, Bangladesh also experienced incredibly intense forest destruction. Again, Bangladesh has a historical background of forest management similar to other South Asian countries.

PF emerged in South Asia and gradually intensified since 1970, popularly known by the name SF, but also as CF and PF, based on various local situations. PF gradually emerged in increasing trends and manifestations due to diversified PF contexts and philosophies. Therefore, PF has local and regional variations in nature and magnitude in and around the South Asian countries also. Nevertheless, within these various contexts, there are some common goals of participation, socio-economic issues, local institutional growth and co-operative activities, etc.

In Bangladesh, PF programmes and activities have varied based on topography, forest intensity, the nature and status of forests, communities living in and around forests, social and related economic and livelihood factors, land uses and the nature of people, etc. Based on these factors, separate programmatic activities were undertaken in plains and hills. Except the Forestry Sector Project that covers only

one district of CHT (Bandarban), all the other country-wide projects did not include CHT.

This chapter briefly elaborated the abovementioned contexts from Bangladesh perspectives. This chapter examined PF programmes in light of some selected goals pointing towards poverty reduction and participation. This review showed that physical quantitative achievements, like nurseries, plantation raising and related items, were given more attention and may be regarded as having been achieved satisfactorily. However, the achievements in terms of participation were notably insignificant. Therefore, the participatory goals of the PF projects and programmes were not realised to a large extent.

In closing, this chapter also briefly described the major GO/NGO PF projects conducted so far in CHT. This included summaries of the project objectives and implementing goals and strategies, covering the technological and management aspects, probable impacts and implications, etc. This project document review provides a conceptual basis for subsequent empirical studies of these project activities and observed performances and consequent analytical findings and inferences which will be stated in Chapter 5. Chapter 6 will then elaborate on the implications of the studies, as well as suggest probable policy and functional level guidelines for future PF interventions in CHT. With this end in view, the following chapter, Chapter 4, will deal with methodological considerations of the study and the logical framework thereof.

Chapter 4

The Research Design and Methodology

Introduction

This study concerns the concept and practice of ‘Participatory Forestry’ with a particular focus on selected participatory forestry technologies, including forestry woodlot and agro-forestry land use practices, which were implemented for the socio-economic welfare of the participants and good governance as a whole. Extensive study of the literature on this topic shows that economic welfare and social upliftment of participants, as well as good governance status are considered the major factors for determining the achievements of PF projects. Khan (1998a) and Davidson (2000), among many others, used these factors as key indicators to comment on the current status and future prospects of PF achievement. Significantly, PF as a means of poverty reduction has moved to centre stage in Bangladesh (Alim, 1988; Ahmed and Azad, 1987; Khan 1998a; Khan 1998b). The government has attached the highest priority to PF in the forestry sector and has underscored PF’s present and potential roles in poverty reduction and rural development (Task Force 1987; Quddus et al., 1992; Rahman, 1992; FMP, 1992; cited in Khan et al., 2003). In studying the operational achievements and performance of PF projects, Khan et al. (2003) also pointed out the impact of PF for poverty reduction and community participation through social development, good governance and pro-poor growth. In CHT, PF practices were carried out focusing on *jhumia* rehabilitation and poor villagers under GO and NGO initiatives as separate efforts, and therefore studies were carried out in different programmatically-selected centres or villages covering the three districts of CHT. In this perspective, it can be said that this is a macro-level study based on purposely-selected villages or centres using PF practices. It assesses the performance of selected PF techniques introduced to increase socio-economic welfare through poverty reduction and gainful participation.

This chapter introduces the criteria for the selection of PF projects for this research study as well as the study villages, together with an analysis of their selection and empirical study procedures in accordance with the conceptual framework of the study as developed, and techniques, tools and strategies for analysis. It also elaborates on

methodological considerations and techniques, including the procedure of data collection and the sources of information.

The Framework of the Study

Based on different frameworks and a variety of analytical literature, a conceptual framework for this study has been developed. Economic welfare, social upliftment and good governance were taken as overall exploring parameters, incorporating indicators for in-depth study of componential farming practices and their socio-economic gain and impacts on participating farmers' livelihood development, asset accumulation, working opportunity, social status, environmental development, along with related general and/or crosscutting issues. The determination of indicators for participation, assessment and achievement for PF practices, focusing on economic and social development that impacts participating farmers poverty reduction, was given due consideration. The framework was used in preparing structured and unstructured questionnaires as well as a guide for empirical studies and analysis.

In CHT, PF practices were mainly based on farming practices comprising forestry, agro-forestry, agriculture and livestock components. Hence, the economic welfare of the participants was also mainly based on the income generated from these componential practices. The overall farm income is the aggregate of the componential incomes. Again, the scant information about PF performance studies on CHT PF practices found in literature showed that those conducted were mainly general studies on particular villages and particular agency interventions. The componential income was found not assessed in-depth. Moreover, studies, even general studies, comprising componential comparative studies among the intervening agencies were also lacking. Comparative componential income and expenditure-based studies among the GO and NGO intervening agencies in CHT are also insufficient. Therefore, determining indicators for this research study were incorporated accordingly with end this in view. Expenditure bases, componential choice and priority, including product consumption for livelihood, as well as component-wise social expenses that can determine the social gain and awareness of the participants, were incorporated as indicators. Moreover, the indicators of participation and achievement in poverty reduction that were previously widely used by many researchers in different regions of Asia were also incorporated. The indicators are as follows:

1. Economic Welfare

- a. Comparative overall income gain as PF participant and non-PF participant. Awareness and perception of the participants about income generation from PF practices.
- b. Income of participants including componential farming income (forestry, agro-forestry, agriculture and livestock) and forestry practices with their components (tree, fruit, bamboo).
- c. Wealth and assets generated from land holding (forestry and agro-forestry plantations, agricultural crop production, livestock rearing, etc) and awareness and perception of wealth and asset accumulation.
- d. Employment and associated opportunities, such as work opportunities provided by the projects as well as off-farm income opportunities.
- e. Environmental sustainability, via general observation of PF project villages, with a particular focus on forest management and watershed management aspects.

2. Social Upliftment

- a. Expenditure incurred in farming practices, including componential farming expenditure (forestry, agro-forestry, agriculture and livestock) and forestry practices with their components (tree, fruit, bamboo). Awareness about investments in order to generate more income for better livelihood and for gaining social status by being more involved in social activities.
- b. Consumption – Consumption of crops and perception about the quality and nutrition of food intake.
- c. Housing – Current state of housing and maintenance, and how it has changed over time.
- d. Education – Awareness of the importance of education and changes in ability to send their children to school, access to children's education, increasing educational status of the family, notable expenditure incurrence for children's education.
- e. Health–Awareness about healthy living and notable expenditure incurrence for family medical care, better sanitation, access to safe water, etc.
- f. Dress – Expenditure incurrence for wearing clothes for dressing themselves and their children, use of better quality and more colourful clothes.

- g. Festivals – Participation in religious events and other festivals, expenditure incurrence in festival events, etc.
- h. Entertainment – Expenditure incurrence for entertaining guests, friends and relatives.
- i. Gender – Participation in PF as well as household decision making.
- j. Training and perception about improved living – Working skill development and awareness building via relevant training, involvement in social activities, etc.

3. Good Governance

- a. Participation – i. Extent: opportunities through decentralization, linkages, flexibilities and incentives provided by the projects; ii. Nature: voluntary, induced and forced participation in decision-making and implementation of management and operational tasks; benefit sharing; monitoring and evaluation.
- b. Ownership sense – Land and crop tenure, agreements, etc.
- c. Nature of Administration – Bureaucratic or cooperative in respect of knowledge and attitude of staff, local institution leaders and related extension services, etc.

This study relies on both technical and social, as well as primary and secondary data and information. The findings and inferences were drawn using both quantitative and qualitative analyses and observations. Different indicator-based componential variations among FD, CHTDB and NGO PF participants were ascertained through One Way ANOVA (Duncan's). Relationship characteristics were ascertained through Correlation and Regression analysis; inferences were drawn on the basis of associational levels as described by Davis (1991: 49); also cited in Baker (1999): 1) Negligible Positive Correlation (NC) = + 0.01 to + 0.09; 2) Low Positive Correlation (LC) = + 0.10 to + 0.29; Moderate Positive Correlation (MC) = + 0.30 to +0.49; Substantial Positive Correlation (SC) = + 0.50 to + 0.69; Very Strong Positive Correlation (VSC) = + 0.70 or higher; as well as Regression Model and levels of significance ($P \leq 0.05$; $P \leq 0.01$; $P \leq 0.001$). The extent and nature of participation was assessed by the above participation indicators under the broad heading Opportunity indicators and Prevalence indicators as developed and used by Uphoff, et al. (1979), Zaman (1984) and also used by Khan (1994) and Khan and Hasan (1995a) for analysing participation in South Asian countries. Finally, the PF achievements in CHT were inferred

incorporating all the specific indicatory findings under the following broad indicator headings obtained via going through a wide variety of frameworks and literature on poverty reduction and participation analysis (Khan, et al., 2004; Khan, et al., 2003; ADB 2003a, 2003b, 2001a, 2001b, 1999a, 1999b; Sen, 2000; ODA 1995; Adnan, 1992).

1. Economic Welfare:

- a. Income, Employment and Associated Opportunities
- b. Environmental Sustainability

2. Social Upliftment:

- a. Human Capital Development
- b. Social Capital and Inclusion

3. Good Governance:

- a. Participation and Involvement
- b. Observance of Contracts and Agreements
- c. Administration, Technical Design, Extension Services and Bureaucracy
- d. Voting/Election of Leadership

Methodological Aspects

The methodological aspects of research set the stage for acting on theories and carrying out empirical investigations (Khan, 1998a). Methodology is defined as a “system of explicit rules and procedures on which research is based and against which claims for knowledge is evaluated” (Nachmias and Nachmias, 1992: 14; Khan, 1998a: 121). Research methodology facilitates communication between the researcher and respondents, serves as a basis for logical reasoning, helps to verify empirical findings of other studies and to facilitate replication. What sets the scientific approach apart from other modes of acquiring knowledge is its methodology and therefore it is at the core of any scientific research.

There is no universally acceptable or absolutely flawless research method. The suitability of research techniques and approaches are “essentially relative” (Isokun, 1985: 81) and are influenced by the particular research topic, its demand and contextual setting, the level of competence of the researcher and structural and logistic limitations of the research (Khan, 1998a: 121). According to Ahmad (1991: 166-7), the use of a combination of methods, i.e., methodological pluralism (a combination of various qualitative and quantitative methods to

compliment each other) is a logical way to minimise the drawbacks of a particular method. Burgess (1982; cited in Hye, 1985: 9) stated that the field researcher has to be a methodological pragmatist using a diversity of methods, strategies and tactics. All methods are tools and have some relevance and value in understanding findings from a holistic point of view. Flexibility for modification in the field has also been emphasized for eliminating unimportant variables in the process of data collection during field work and to obtain realistic results (Khaleque, 1992: 76). A method of intensive field work (Participant Observation method) is the most suitable for all kinds of village-based micro-level studies (Chowdhury, 1978). Research on social forestry more or less encounters some ethnographic field work, i.e. inclusion of elements of anthropological methods for a more participatory style to collect the appropriate information. Many researchers followed the Participant Observation method in this regard (e.g., Rozario, 1992; Burling, 1997; Kotalova, 1996; White, 1992; Khaleque, 1992; Karim, 1990; Islam, 1986; Blanchet, 1984; Bertocci, 1970; Chowdhury, 1978; Chowdhury, 2006; Nath and Inoue, 2008a; 2008b; 2009).

Based on the above observations, in this study, in order to reduce any adverse effects of a particular method, and also to exert more flexibility by choosing alternative techniques and use a combination of methods to obtain optimum results, methodological pluralism has been relied upon. Multi-method approaches adopted in this study are reconnaissance, pilot survey, in-formal and formal interviewing based on qualitative and quantitative structured and unstructured questionnaires, oral histories, focus group discussions, key informant interviews and empirical observations, in all 9 villages that were studied during the time of fieldwork. Demographic, socio-economic, environmental and participatory data, as well as data on silvicultural and/or technological aspects, was collected as primary data. More importance was given to empirical observations than those of logical findings. Secondary data was collected from journals, books, articles, monographs, souvenirs and official documents and reports.

The Study Phases

With the objectives of conducting a research study that focuses on the performance of Participatory Forestry interventions in CHT emphasising participating farmers' socio-economic upliftment and the nature of participation with the ultimate goal of achieving their poverty reduction and mitigation, empirical studies on purposely-selected villages were carried out. Each study village was a micro unit, which covered each separately identified respective intervention, as regards to

PF technology, under GO/NGO initiatives. This procedural study, as conducted, was fragmented into three phases as follows:

Phase I

The relevant offices of the Forest Department, CHTDB, and NGOs practicing PF in CHT were individually visited. A great deal of efforts and time were invested to develop personal rapport and links with the concerned staff. It was found that the GO agencies generally targeted landless indigenous people and settled them in USF land in a cluster forming rehabilitated villages and NGOs generally targeted poor villagers living in old villages and traditionally-allotted *jhum* land and farmers with marginal land. By going through the relevant records as well as from conversations with the officers and staff of the respective agencies, the activities and location of the targeted settlements and villages were noted. Then, in line with the research objectives, probable villages that may have fallen under the category of purposely-selected villages to be investigated were noted down with the help of district maps and available maps regarding settlement and plantation in the Plantation Journals and Settlement Journals of the respective agencies offices. Next, programmes were selected for reconnaissance visits to their villages. During reconnaissance surveys for selecting villages (units of micro study), the location, accessibility, differences in technology and ethnicity, the PF system and the surrounding environment were taken under consideration, particularly through observation. An attempt was made to cover the whole CHT region, as per areas where interventions were visibly observable. Finally, among the visited villages in the three hill districts of CHT, one village from each GO and NGO projected intervention was purposely selected for primary data collection in particular, with secondary data and other information coming from different sources and methods as mentioned when discussing the methodological aspects. However, the previously selected villages, on the basis of paper information, were found suitable and therefore their selection was finalised for proceeding with further studies, as detailed below.

The Study Projects, Locations and Villages

In CHT, the Forest Department, Chittagong Hill Tracts Development Board (CHTDB), and a few NGOs conduct PF practices. The Forest Department started rehabilitation of, whom official documents terms as, ‘nomadic ethnic’ people on USF land in CHT from 1960. The failure of that programme resulted in the beginning of PF activities from 1980–81 in the form of afforestation and rehabilitation of *Jhumia*

families on USF land. This programme was implemented in three phases, named 1st Phase, 2nd Phase and 3rd Phase, and after that under the Forestry Sector Project, using different PF systems and technology. CHTDB began functioning in 1976 and launched a PF project, the Upland Settlement Project, from 1979-80 to 1993-94 in the 1st phase and from 1994-95 to today in the 2nd phase using the same system, Sloping Agricultural Land Technology (SALT), in both phases. A good number of NGOs are working in CHT, but their work is mostly concentrated on credit activities and associated work. Caritas launched a Horticulture Development Project in 1991 which continues to today, using a similar PF system and concentrating only in the Bandarban district. Tayanga is working for village common forestry and so far covered only three villages in the Rangamati district. Similarly, the activities of Jabarang are concentrated only in the Khagrachari district.

In identifying the ethnic communities for this study, well-populated communities that form the majority population of CHT was purposely selected. Gain (2000: 9), quoting the population census of 1991, showed that among the twelve ethnic communities, the Chakma, Marma and Tripura communities form the majority population of CHT. Tripura and Harun (2003: 77) citing Gain, (2000:9) as their source, showed that more than eighty percent of the CHT population are of the Chakma, Marma and Tripura communities. Moreover, these three communities mostly live in accessible areas of CHT where PF practices have been carried out by different agencies, and in this view, the Chakma, Marma and Tripura participants were selected as the foci of the study.

In order to examine the major research theme - the performance of PF systems of different agencies in economic and social upliftment of participants through poverty reduction and participation - suitable empirical cases were identified based on the following characteristics : 1) the cases should reflect the trend in progressive PF interventions in CHT; 2) they should also contain typical interest in Participatory Forest Land Use; 3) the cases should fall within the scope of government and non government interventions in respect of policy and related local issues; and 4) the study sites should more or less represent typical geo-physical characteristics of CHT as a whole.

Besides this, the management and administrative set up of PF agencies and local institutional arrangements of participating villages

or centres in relation to CHT traditional or indigenous general patterns were also taken into consideration.

In light with the above criteria and considerations, the mainstream PF activities in CHT were initially divided into nine clusters based on similar technology interventions as a whole. These are: (1) Integrated Afforestation and *Jhumia* Rehabilitation Project, 1st Phase, Forest Department, (2) Afforestation and *Jhumia* Rehabilitation Project, 2nd Phase, Forest Department, (3) Afforestation and *Jhumia* Rehabilitation Project, 3rd Phase, Forest Department, (4) Forestry Sector Project, Forest Department, (5) Upland Settlement Project, 1st Phase, Chittagong Hill Tracts Development Board, (6) Upland Settlement Project, 2nd Phase, Chittagong Hill Tracts Development Board, (7) Horticulture Development Project, NGO Caritas, (8) Village Common Forest Project, NGO Tayanga, and (9) Sustainable Hill Cultivation Program, NGO Jabarang.

Subsequently, four rehabilitated centres/villages from the FD's PF programmes were purposely selected – considering that fact that these villages experienced the introduction of four separate PF systems/technologies that represent the major trends in PF practices by the FD in CHT. Based on similar considerations, two sites from the CHTDB Upland Settlement Project were selected: one centre/village from the 1st phase and the other from the 2nd phase. In the case of NGO PF activities, one HRD (Horticulture Development) project centre/village from Caritas, one centre/village from the VCM (Village Common Forest) project of Tayanga, and one project centre/village from Jabarang were selected. Selection of one centre/village may be representative due to the practice of using the same system/technology in all the centres/villages in all the separate project interventions by FD, CHTDB and NGOs in CHT. All the rehabilitated centres or villages where the same technology was introduced were found to be similar in activities during reconnaissance surveying.

The purposely selected project villages were visited first. Then, some randomly selected villages of the respective projects were visited to determine whether the villages were practicing forestry in the same or a similar way to those with PF programmes introduced or not. No significant differences were observed between PF villages of the same project intervention in all GO and NGO cases. Hence, it was confirmed that selection of one village from each project was sufficient to represent the whole project. It is also notable here that in purposely

selecting the representative villages for study, covering of all the low hill-dwelling areas of Rangamati, Khagrachari and Bandarban Districts of CHT was confirmed through extensive visits, observations and reconnaissance survey as well as my previous knowledge about the locations and communities, gained during my time working in CHT as a forester (DFO). A typical single case study can capture the circumstances and conditions of a commonplace situation and lessons learnt from such a case can be acceptably informative about the average situation (Yin 2003). Therefore, the selection of one single village from each system/technology intervention can be considered as representative of the concerned cluster.

During field reconnaissance survey, it was observed that among the selected projects, only the Forest Department's PF initiatives exist in villages in the three hill districts of CHT. However, in the case of their recent projects - the Afforestation and *Jhumia* Rehabilitation, 3rd Phase and the Forestry Sector Project - activities were found only in Bandarban district. Again, NGO activities having similar land use practices were carried out in the three hill districts, but were more concentrated in Bandarban. CHTDB's activities were also concentrated mostly in Bandarban, and also in Khagrachari. Therefore, three study villages were selected from Bandarban district; one from each FD, CHTDB and NGO projects, namely the Afforestation and *Jhumia* Rehabilitation 3rd Phase, Upland Settlement Project 2nd Phase and Horticulture Development Project 3rd Phase of Caritas, respectively.

Again, four FD villages were selected, one from each of the four consecutive projects, namely the Integrated Afforestation and *Jhumia* Rehabilitation project, Afforestation and *Jhumia* Rehabilitation 2nd phase, Afforestation and *Jhumia* Rehabilitation Project 3rd Phase (this village was selected earlier from Bandarban district), and Afforestation and Rehabilitation under the Forestry Sector Project. In this case, in order to cover all three districts of CHT, villages from the Integrated Afforestation and *Jhumia* Rehabilitation Project and the Afforestation and *Jhumia* Rehabilitation project 2nd phase were selected from Rangamati and Khagrachari districts respectively. Moreover, through very recent, but separate interventions, a village in Rangamati district was selected from the Village Common Forest Project of NGO Tayanga (their activities are found only in Rangamati district) and another one from NGO Jabarang in Khagrachari District (their activities are found only in Khagrachari district). In selecting all the

above villages, the availability of participating farmers from the targeted Chakma, Marma and Tripura communities, as well as accessibility and research workability, were also taken into consideration.

Longodupara Jhumia Rehabilitation Village

This village is situated in the Gaindha Mouza of Gaindha Union, Rajasthali Upazilla under Rangamati District. Though located close to the side of the Kaptai-Rajasthali connecting road, taking into account the prevailing law and order situation of CHT, this location may be considered as a comparatively remote place. In the year 1986-87, this village was established under the Integrated Afforestation and *Jhumia* Rehabilitation project in CHT, 1984-85 to 1988-89, executed by the Pulpwood Plantation Division, Kaptai, of the Bangladesh Forest Department. The rehabilitated families are mostly Marma, with a few Tanchanga as well (in this research study Tanchanga are placed in the ethnic group Chakma, according to their views that they are the part of Chakma community). During field study, it was found that 15 families were residing in that village and that they were nomadic and landless before rehabilitation. It is notable here that families who were not landless were also given land in the same village, but some of them left the village, and some others are still occupying land, in a fallow condition, and residing outside. In consultation with the FD staff and from going through the Forest Division records, it was found that initially 65 families were rehabilitated, with most of them leaving after the end of the project period in the course of time, leaving 15 families residing in the village at present. During rehabilitation, each family was provided with 2.02 ha land to use for homestead, horticulture and agriculture production. Homesteads were placed in a clustered way in one place giving 0.20 ha of land to each family and the rest of the lands for each family were on the side, close to the village with demarcation by survey.

Alotila 15 Family Jhumia Rehabilitation Village

This village is situated in Alotila Mouza of Matiranga Union, Matiranga Upazilla under Khagrachari district. Situated adjacent to the side of Khagrachari highway, it is easily accessible. In the year 1994, this village was established on USF land under the Afforestation project in the Reserved and USF land and *Jhumia* rehabilitation in CHT 2nd phase, 1990-91 to 1993-94, executed by the Khagrachari Forest Division of the Bangladesh Forest Department. The

rehabilitated families are mostly Tripura, with a few Marma. During field study, it was found that all the rehabilitated 15 families are residing in the village. They were landless before rehabilitation. During rehabilitation, each family was provided with 2.02 ha land to use for homestead, horticulture, bamboo and agriculture production. Homesteads were placed in a clustered way in one place, giving 0.20 ha of land to each family and the rest of the lands for each family were on the side, close to the village with demarcation by survey.

Banfulpara 16 Family Jhumia Rehabilitation Village

This village is situated in Gheaw Mouza of Royanchari Union, Rayanchari Upazilla under Bandarban district. Travel from Bandarban town is through the river. This site is comparatively remote considering the only way to travel there is through the river, and in respect of the prevailing law and order situation in CHT as a whole. In the year 2000-2001, this village was established on USF land under the project Afforestation in the Reserved and USF land and *Jhumia* rehabilitation 3rd phase, 1995-96 to 2000-2001, executed by Bandarban Forest Division of the Bangladesh Forest Department. It is mentionable here that this 3rd phase of the project was executed only in Royangchari Upazilla, Bandarban. The rehabilitated families are from the Marma community. During field study, it was found that all the rehabilitated 16 families are residing in the village. They were all landless and nomadic before rehabilitation. During rehabilitation, each family was provided with 2.02 ha land to use for homestead, forestry with Teak and Gamar species, agro-forestry and agriculture production. Homesteads were placed in a clustered way in one place giving 0.20 ha of land to each family and the rest of the lands for each family were on the side, close to the village with demarcation by survey.

Babupara Jhumia Rehabilitation Village

This village is situated in the Mouza Alikodom Beat of Alikodom Union, Upazilla Alikodom under Bandarban district. This is also comparatively remote, but easily accessible, as it is situated in the Matamohori Reserved Forest. As it is Reserved Forest, the land is under direct control of the Forest Department. In the year 2002-03, this village was established under the Afforestation and *Jhumia* rehabilitation component of the Forestry Sector Project, 1998-99 to 2005-06, executed by Lama Forest Division. It is mentionable here that under this project, *Jhumia* Rehabilitation was carried out only in

Matamohori Reserved Forest. Rehabilitated families were Marma, Chakma and Murong. Before rehabilitation, they were landless but residing in the Reserved Forest as Forest Villagers and involved in *jhuming* practices in the degraded parts of the Reserved Forest. During field study, it was found that all the rehabilitated 28 families were residing in the village. During rehabilitation, each family was provided with 2.02 ha land to use for homestead, forestry with mixed indigenous and exotic species, agro-forestry and agriculture production. Homesteads were placed in a clustered way in one place giving 0.20 ha of land to each family and the rest of the lands for each family were close to the village, where degraded forestland was available. Demarcation of land for each family was done by survey.

Gasbow Project Village

This village is situated in the Mouza Gasbow of Bibowchara Union, Khagrachari Sadar Upazilla under Khagrachari District. It is situated adjacent to the to the Khagrachari-Panchari road and is easily accessible. The village was established in the year 1981 under the Upland Settlement Project 1st phase, 1979-80 to 1993-94, executed by the Chittagong Hill Tract Development Board. During field study, single homesteads were found spread around the village. Each family was given 0.91 ha of USF land for homestead, horticulture and bamboo production. They also provided 1.62 ha of land to each family in a rubber plantation, with 24.29 ha established in the same year, as collective settlement. The rehabilitated families were Tripura and Chakma. Before rehabilitation, they were landless *Jhumias*. During field study, it was observed that all the 15 families settled in relation to the abovementioned rubber plantation are residing in the village.

Kibukpara Project Village

This village is situated in the Shimee Mouza of Kuhlalong Union, Bandarban Sadar Upazilla under Bandarban district. As it is situated very close to the Kaptai-Bandarban road, it is easily accessible. In 1995, this village was established on USF land under the Upland Settlement Project 2nd Phase, 1993-94 to 2004-05, executed by the Chittagong Hill Tracts Development Board. During field study, single and clustered homesteads were found spread around the village. Each family was given 0.50 ha of USF land for homestead and horticulture. They also provided 1.62 ha of land to each family in a rubber plantation, with 29.12 ha established by the Board in the same year, as

collective settlement. The rehabilitated families were Marma, Chakma and Tanchanga (Tanchanga were grouped as Chakma as stated earlier). Before rehabilitation, they were landless *Jhumias*. During field study, it was observed that all the 18 families settled in relation to the abovementioned rubber plantation are residing in the village.

Kemalongpara Village

This village is situated in the Kuhalong Mouza of Kuhalong Union, Bandarban Sadar Upazilla under Bandarban district. It is situated near to the Kaptai – Bandarban road and is easily accessible. According to the villagers' views, this village is more than 150 years old. In the year 1997-98, NGO Caritas started activities there, under their Horticulture Development Project, 3rd Phase. The 30 families living in this village have their own land and homesteads spread all over the village; out of them, 15 are participating in the project. Participating farmers are from the Marma community.

Dulochari Headman Para Village

This village is situated in the Dulochari Mouza of Kakchari Union, Rangamati Sadar Upazilla under Rangamati district. It is by the side of Rangamati – Mohalchari road and is easily accessible. According to the villagers view, the village was established 300 years ago. About 100 families are living in this village and they are mostly Chakma. In the year 2003, NGO Tayanga took this village under the Village Common Forest project and started demarcation, protection and improvement of the Common Forest of this village with villagers' participation. 15 actively participating families were examined and they all were found to be practicing improved farming in their own lands. They gained awareness about participating in rights-based indigenous forestry and livelihood improvement through farming practices.

Mathaipara Village

This village is situated in the Mouza Boromerung of Merung Union, Dighinala Upazilla under Khagrachari District. It is by the side of Khagrachari – Dighinala road and is easily accessible. In the year 2003, this project area was established on USF *jhum* land under the Sustainable Hill Cultivation Program, 2003 - 2004, executed by NGO Jabarang. During field study, single homesteads were found away from the *jhum* land areas. Participants were permanently occupying the traditionally-allotted *jhum* land and NGO Jabarang tried to establish

sustainable hill farming via short term, middle term and long term forestry and agro-forestry species cultivation. 15 families were found participating in this program in the area.

Research on PF activities in CHT is scant and insignificant. Only some project documents from PF agencies are available. Moreover, research in CHT on the theme adopted for my study is barely available. Although there have been some attempts in exploring the linkages between poverty and degradation of forest resources, the focus has typically been on the impact of poverty on the forest, rather than on the analysis of forestry's role in poverty reduction and rural development (Alim 1988; ADB, 2000; cited in Khan et al., 2003). The Asian Development Bank also observed that the present and potential role of forestry in poverty reduction has neither been made sufficiently clear, nor been explored in depth. Some of the recent projects have started to recognise the significance of the implications of poverty and other social issues for PF management; however, the focus has been on the impact of these issues on forest, rather than the reverse (ADB, 2000). This is mostly true in case of PF activities in CHT, although recently this type of assessment has been conducted in the plain land PF activities of Bangladesh. In view of these facts, this study, in its own modest ways, attempts to contribute to the existing gaps in literature and research.

Phase II

A questionnaire was prepared consistent with the objectives, goal-oriented focus and framework of this study. Both structured and unstructured questionnaires were prepared for interviewing participating farmers and key informants, respectively. For each selected village, a pilot survey was conducted. Participants' annual income, land holdings, land uses, occupations, and other possible variables were examined. Participating farmers' annual family income was found to be the best criteria for selecting participants (households) for questionnaire interviews, as other variables were found to be very similar, making it logical to discard those variables. The male or female head of each selected household was interviewed. Unstructured questionnaires were used for project staff, key informants and also for aged individual participants. The total number of participants in the 9 selected villages was 152. Therefore, by using Chako's formula (Chacko, 1965), the number of participants selected for interview was 58, as shown in Table 4.1.

Table 4.1: Organization Respondents Interviewe

District	Rangamati		Bandarban				Khagrachari			Total respondents
Village	Longodu	Dulochori	Kibukpara	Babupara	Kemalongpara	Banapulpara	Alotila	Gasbow	Mathaipara	
<i>Organization</i>										
FD	6	-	-	10	-	8	7	-	-	31
CHTDB	-	-	7	-	-	-	-	5	-	12
NGO	-	5	-	-	5	-	-	-	5	15
Total	6	5	7	10	5	8	7	5	5	58

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board

NGO = Non-Government Organization; Location denoted District

Overall, methodological pluralism was used in collecting the required data for this research study. Various techniques and tools of data collection have been illustrated below.

Techniques and Tools of Data Collection

The study required both quantitative and qualitative data on PF, as practiced by the indigenous communities of CHT with the largest populations. Some major avenues data for this research include: land use, plantation establishment and maintenance, household income, consumption, social and environmental issues, governance and participation. The research also needed to address more qualitative issues, such as the transformation of PF systems introduced from time to time, values and attitudes of concerned participants and PF agency personnel, and various social relations which influence PF. This requires judicious balancing of diverse information and methods. This 'balancing act' is no easy task, and the concern is shared by White (1992), Rahman (1994), Ahmed (1991), and many other researchers. According to White (1992:10), the above concern reflects the ambiguous position of development studies that needed quantitative data and values of anthropological methods for a more participatory style.

Accordingly, as illustrated earlier, the study used methodological pluralism- deploying a logical combination of interpretative qualitative

techniques, such as historical reviews, ethno-histories, observation, group discussions, key informant interviews; and quantitative techniques of questionnaire surveys. Logical planning was done for both sets of techniques to ensure they complement one another.

Sampling

The survey method with questionnaires and sampling is mainly used for generating quantitative data. According to Casley and Lury (1987: 42; cited in Khan, 1998a: 133), sampling provides a flexible method that can be adapted to almost all requirements of data collection. Topics involving particularly detailed in-depth transactions of individuals or households require an intensity of interview and/or observations that cannot conceivably be covered by censuses. A sample is the only mode of inquiry available.

For interviewing participants individually as well as collectively for obtaining both quantitative and qualitative data, a sampling method was used. Stratified sampling, which is often considered to be 'the universal choice for major surveys' (Casley and Lury, 1987: 57) was the method used along with the participant observation method.

For each study village or centre, a reconnaissance was carried out, followed by a pilot survey, with the help of one assistant from Bangladesh Forest School (a forestry graduate working as an instructor) and one or more assistants from local PF agencies and/or from participants as and where necessary. The research assistants were firstly briefed on the objectives, activities and method of sampling and the procedure. For this purpose, we stayed in the nearest available accommodation and each day in the morning went to the study site and returned back in the afternoon. In each case we stayed in the locality several days as long as it was possible, depending on the prevailing local situation. In some cases, due to time constraints and other unavoidable factors, we made repeated visits to the area as required. The pilot surveys served two major purposes: 1) they helped us to rejuvenate our acquaintance and relationship with the localities of the concerned sites, and 2) they helped us to construct a sample frame to serve as the basis for selecting the final samples. In the pilot surveys, participants' annual income was found to be useful as a practical variable, and therefore sample frames concentrating mainly on the variable of participants' income were prepared for each site. In all the FD and CHTDB initiatives, land holdings were allotted similarly. The same amount of land was allotted to FD and CHTDB participants in each village, though in NGO villages the amount of land holding

differed. A major similarity was also found in occupation, as almost all the participants were involved in farming and manual labour. Accordingly, land holding, occupation and other possible variables were logically discarded when preparing sample frames by pilot surveys that would ultimately be used in selecting final sampling.

In all the rehabilitated and targeted villages/centres with GO and NGO interventions, the number of participants ranged from 15 to 28. Obviously, the purposely selected villages/centres for this research study also had the same range of participant numbers. The total number of participants during pilot surveys in the participating villages were: Alotila (15), Longodupara (15), Banafulpara (16), Babupara (28), Mathaipara (15), Kibukpara (18), Kemalongpara (15), Dulochari (15), and Gasbow (15). These small populations in study villages gave me another opportunity. A different course of action was executed during pilot inquiry. To get a general picture of the life and living of the participants, a quick census of all the households was done, concentrating on annual income, using the advantage of the limited number of participants in the villages. A sample survey was conducted afterwards to determine sample size for individual household interviews, based on prepared questionnaires. Depending on the data from the pilot survey, three strata were formed and the sample size in each stratum was calculated on the basis of Chacko's formula (Chacko, 1965):

$$n = (ts/d)^2$$

Where, $d = p \times Y/100$

$t = 1.96 (2)$

$s =$ sample standard deviation from the pilot survey

$Y =$ sample mean from the pilot survey

$p =$ margin of error (at 15%)

Sample sizes were calculated accordingly. Samples were randomly drawn and the questionnaires were pre-tested on at least two participants (households) in each of the selected villages/centres. As in CHT, PF practices were based on rehabilitated or targeted households on a participant basis, with households the focal point for administering questionnaires through interviews and field checking and observation.

According to the observation of Ahamed (1993: 17), in studying the implications of social forestry activities by the rehabilitated families of Betagi and Pomora in Rangunia, Chittagong, a household is typically

built around a nuclear family, in keeping with the predominant pattern in the project areas. The household members have a joint budget, and by definition, a single unit for production and consumption, each household acting as a decision-making unit. Normally the oldest male, the father or the eldest brother, acts as the head of the household. This was the case for households of Bengali participants, as all the participants in the Betagi and Pomora projects were from the Bengali population. Households in ethnic communities in CHT may be defined similarly, except that the head of households is, in some communities, the oldest female member; however, our selected Chakma, Marma and Tripura communities are all male-dominated. I followed this model regarding households in interviewing individual participants. I also intended to identify the responding strategies adopted by household members towards PF practices in attaining economic welfare, social gains and response to social relational networks, and the level of their participation as well as that of governing agencies, and implications of the programmatic project interventions.

The household is the most common unit of production as well as consumption (Casley and Lury, 1987: 161; also cited in Khan, 1998a: 135). Casley and Lury, citing the argument of the United Nations Statistical Commission in 1979, stated that there is universal recognition of the key role of the household in the socio-economic development of developing countries. Households account for much of the productive activity and are themselves affected by economic and social changes. Hence, for my study, participants' households are logically considered as suitable units for data collection and analysis from a statistical point of view. Jansen (1986: 4), in observing the competition for scarce resources in rural Bangladesh, with the purpose of collecting quantitative data as well as dealing with the whole range of relationships beyond the geographical limits of households, focused on targeted households. Household members utilise wide social and economic links to pursue survival strategies for production, consumption, use and excess of resources (Khan, 1998a: 135); therefore, I focused on these household linkages with an expectation of understanding the surrounding framework of CHT's PF land use practices.

Discussion (Questionnaire Interviews)

Individual questionnaire interviews were conducted with the randomly selected participant from each stratum based on stratified the sampling method. Both structured and unstructured questionnaires were used. There are limitations to structured questionnaires and this aspect was

always kept in mind whilst recording interviews. Non-response, biased response, and artificial findings are the common problems generally associated with questionnaire surveys. Hence, designing and administering a good questionnaire is very demanding on the researcher (Bell, 1987, Casley and Lury, 1987; cited in Khan, 1998a: 137). Nevertheless, with all limitations, questionnaire surveys are still the most widely used tool for easy and quick collection of basic information (Khan, 1998a: 137). Bell (1987: 58) also commented that questionnaires are a good way of collecting information relatively cheaply. This requires that the researcher be sufficiently disciplined to abandon questions and responses that are superfluous to the main task or goal.

We were, of course, cautious in applying this method. To minimise the potential weaknesses, we used supplementary techniques such as observation and informal discussions with the respondents. Using the participant observation method, we talked with participants, moved from house to house, observed their lifestyle, and day-to-day activities. Two sets of questionnaires, one structured and one unstructured were designed. Basic points and topics were incorporated in the questionnaires, which, by exchanging opinions with respondents, could then be elaborated upon. After individual discussions with a number of participants, we arranged group discussions in all the case study villages where other participants had taken part along with the individual respondents. These informal meetings and group discussions served as supplementary tools to structured questionnaires. This offered an opportunity to foster a friendly atmosphere and provided a flexibility of responses and favourable discussion environment to raise and share many vital issues between the responding participants and the research team. The questionnaires were designed incorporating the wide scope of the study, and were admittedly quite long and time consuming. Considering the respondents fatigue and unwillingness to continue responding for a long time, modifying their daily working schedule, we divided discussions into three or four separate sessions as and when necessary. The participants and PF agents decided the time and venue for such meetings at their convenience. The introductory meetings were usually held in participants' households and the subsequent sessions also often took place in participants' houses (in most cases, as decided by the respective participant), or village Headman's house, Karbari's house, tea stall, rural market, or primary school premises. We interviewed the participants, i.e., the male or female head of household who possessed two major characteristics: 1)

he or she was the main earning member of the household, and 2) he or she exercised substantial authority over family decisions. In very few cases, female household heads were found and they came directly in front of us and offered interviews. In other cases, male heads of households were mainly interviewed. In order to avoid the exclusion of women during interviewing, we requested the presence of participants' wives in interviews, which was mostly met with a positive response. Some of the wives came and set nearby, others sat by the side of the door near to our conversation and some others sat inside an adjacent room. They heard the questions and answers and responded as and when necessary. The husbands also discussed answers to questions with their wives as deemed necessary by them.

In the evening we used to meet in the lounge of the rest houses where we stayed overnight. We shared our experiences over supper and performed cross-checking of the results. Observations made during the day were recorded. The assignment for the next day was also briefed and special attention was given to particular issues which I wanted observed and noted.

PF agency officials were selected purposely. Officers and staff were chosen from all levels of organizational hierarchy to make the selection representative. Hindrances to interviewing officials, such as their busy schedules and frequent need to be outside their office, difficulty often experienced in contacting them quickly, persuasion and patience required to arrange meetings with them, their reservations about sitting for interviews, and difficulty in contacting the staff remotely located, were mostly overcome in regards to the Forest Department as well as other agencies, due to our personal links and rapport with many of the targeted agencies and people.

Participant Observation

During fieldwork, we also tried to follow the participant observation method. The research team maintained a diary for recording, where in the form of notes, virtually any observed phenomenon of interest was noted as well as all the happenings witnessed during the field work. To observe their lifestyles, we moved from house to house and involved myself in informal conversations during the short span of time that was available.

The observation method is particularly appropriate when a high degree of analytical content is required (Casley and Lury, 1987: 64). According to Bell (1987: 88), observation is a technique that can reveal characteristics of groups or individuals which would have been

impossible to discover by other means. He also opined that direct observation might be more reliable than what people articulate in many instances because formal interviews can only reveal how people perceive what happens, not what actually happens.

In reality, we could not apply the participant observation method in its true sense, observing directly by myself while staying continuously in study villages or in the locality for a sufficiently long time to make effective observations. The prevailing situation in CHT did not allow me to stay in the study villages even for a short period of time, and overnight stay was entirely impossible. Moreover, law enforcement agencies in CHT do not allow such a form of stay for a government official such as myself. Even when one day I tried to visit the Horticulture Development Project site of Caritas, a site where implementation begun in 1991, in the Rajasthali Upazilla of Rangamati district, a comparatively remote place, we could not go there as the law enforcement agency resisted me on the way and we were asked to return. In such circumstances, we sought the assistance of, and deployed a local forest staff member (of ethnic origin), providing him with proper training and guidance to help date collection.

Besides, we went for a controlled simple observation to watch and analyse the economic and social relations and related issues of participatory forestry practices, their achievement and participation. During reconnaissance, pilot survey, questionnaire interviews and group discussions, etc., we noted the available observation issues in an improvised manner as much as possible, and finally tallied our observations with those of the deployed ethnic forest staff and research assistants. After thorough discussions with members of the research team, the most probable and authentic information was recorded for compilation and analysis. Knowledge of local dialects and culture also helped in assessing observation findings.

In this way, adjusting with the prevailing situation, an improvised observation method was designed and followed.

Key Informant Interviews

Key informants were selected from elderly persons, local leaders (headman, *Karbari*, UP chairman/member) school teachers, labourers, religious leaders, surrounding land owners, government and NGO staff, etc. The number of informants varied from 5 to 11 in different sites, depending on the requirement, availability to respond, the mood and content of responses, etc. Selection was done only after thorough survey of the major sources of information in the area. Before that, we

sufficiently familiarised ourselves with the locality. Exercising precaution in selecting key informants assisted me in finding the best informants in each locality. Additionally, selection was influenced by the informants' position, reputation, and his knowledge of the information required. In this respect, it may be said that the Position/Reputation method was primarily followed. This Position/Reputation method has been frequently used by sociologists (for example, Quddus, 1978: 36-47; Chowdhury et al., 1979: 1-18; cited in Khan, 1998a: 139). The key informants helped me to understand complex situations. They provided me with valuable information regarding previous occupations and lifestyles of PF participants, their economic and social status and related issues. Informants imbued in me their knowledge of previous local forest history and the gradual introduction and progress of PF management and practices. Moreover, they shared their insight into the subsequent implications of PF, including general socio-economic and environmental gains, the level of participation of the PF agencies and participants, gender issues, constraints and possible remedies, and ways of improving future forestry practices in CHT.

Ethno-histories and Life Histories

In order to get information about the participants' past social, economic, religious and cultural life, i.e., their lifestyle before rehabilitation or settlement, we relied on oral histories (ethno-histories and life histories) and retrospective interviews. Gordon (1979), Jansen (1986), Price (1995), Khaleque (1992), Khan (1998a), and many other researchers made use of ethno-histories and life histories. According to Chambers (1991: 525), ethno-histories are the histories recalled and recounted by rural people. For this study, the recording of general and life histories of participants and key informants in and around the concerned settlement or villages was done with the utmost caution in regards to the credibility of the narrator. we found that more reliable information was obtained mainly from key informants. Along with older participants, key informants from older generations provided me with valuable information regarding the past economic and social life of participants, past traditional forestry practices, the then forestry status of the rehabilitated or settled villages, the gradual degradation of forests and the emergence of social forestry and trend towards development.

Secondary Sources and Historical Reviews

Secondary data and historical reviews were also used as a basis for this study. In almost all forestry research studies, the use of secondary data

along with primary data provides a general context. Moreover, in social sciences, secondary data is extensively used. (Nachmias and Nachmias, 1992: 192). PF also includes a major section of socially-related variables. According to Glenn (1978), secondary data brought about an almost revolutionary change in survey research.

of historical material in research, Wilkins (1970: 52; cited in Khan, 1998a: 139) argued that to overlook the contribution the historical method can make to the social scientist's work would be to deny him an understanding of those processes which enrich his study of the contemporary world. It would be foolish, indeed, to attempt to divorce the present from the past, as society today is to a large extent a reflection of what has been happening. Published books, journals, censuses, articles, monographs, and souvenirs collected from different sources provided me with valuable information on past events. It helped me in obtaining information about the historical perspective of Forest management in general, and the technological transformations, causes and trends of such transformation, towards the emergence and development of PF in CHT in particular. On the importance of the use in it over many hundreds of years. The study of contemporary society without reference to the way in which it has evolved would form only half of a study. Therefore, social scientists are likely to rely heavily upon the historical method. Accordingly, as studies on Social Forestry cover a considerable segment of societies, socio-economics and related studies, the use of historical information is inevitable.

Secondary data and historical reviews for conceptual-theoretical reasoning were accessible sources of information for my research purposes. Gleaning an understanding about experiences of varied cases via delving into history, secondary data and historical reviews, has given me the ability to deal with a wide range of conceptual issues. Besides this, I was able to make conceptual linkages between my study and studies done in and around CHT and beyond that were useful for analytical purposes. These sources are economic in terms of the cost involved, and also allow for easy gathering of information.

Nature, Source and Data Procurement

Both primary and secondary data were used in this research study. Primary data was collected through individual and group discussions based on questionnaire surveys and interviews. Primary data included both the quantitative and qualitative information through structured and unstructured questionnaires respectively. Qualitative data was acquired through oral histories and observation. Secondary sources

included published and unpublished materials, documentation and reports of the Forest Department, CHTDB and NGOs, publications, books and journals related to the subject, newspapers, television programmes, etc. Publications of the Bangladesh Bureau of Statistics and Internet searches also provided valuable secondary qualitative and quantitative information. Specific related institutions were consulted and library work was done. Mentionable libraries are the Institute of Forestry and Environmental Sciences and central library of the University of Chittagong, Dhaka University libraries, Bangladesh Forest Research Institute Library, Chittagong, Forest Academy Library, Forest Department central library, Dhaka, Institute of Development Studies Library, Dhaka, Society for Environment and Development Library, Dhaka, and Tribal Cultural Institute Library, Rangamati and Bandarban. Micro data was collected from the records and files of Forest Divisions, Ranges, Beat, Union Council, Local Land Revenue, Statistics, Agriculture and Family Planning offices. The range of people contacted included respective GO and NGO officials and staff, university academics, forestry and social science researchers and consultants, community elites, farmers, villages, etc.

Phase III

Required data collected through a multi-method approach as stated earlier and secondary data and information collected from different sources and literature reviews was compiled for systematic analysis. Data was handled and analysed in line with the conceptual framework of the study and the strategies for data processing and analysis described below, using Microsoft Excel and SPSS as and when required.

Strategies for Data Processing and Analysis

The use of methodological pluralism was helpful in collecting and gathering the data required for my research. With the multi-method approach, information collected had different measurement levels; therefore, presenting the various methods in a consolidated manner was a difficult task. Complicacy arises in explaining a particular issue via different measurement methods. Supplementation of one method with another rather than comparing them with one another is considered the best way to simplify the difficulty without losing the essence of each set of data.

The collected information (primary and secondary quantitative and qualitative data) was summarised in tabular form. Noted information was transferred to a sheet for analytic narration. Thus, both tabular

presentation and analytic narration were used. For compilation and systematic analysis, the findings and empirical evidence have been classified into the following categories:

1. Information related to the history of transition of Forest Management, trends towards Participatory Forestry and related policies, acts and regulations.
2. Information related to past lifestyles and traditional practices of rehabilitated ethnic participants in particular and ethnic communities in general.
3. Empirical data related to major manifestations of PF Land Use practices.
4. Empirical data related to present villages (rehabilitated or targeted villages) and socio economic characteristics of FD, CHTDB and NGO participants.
5. Empirical data related to forestry practices and PF technology interventions.
6. Empirical data related to the participation of participants and PF agencies in PF management and operational practices.
7. Analytical findings, impacts and implications of FD, CHTDB and NGO interventions.
8. Recommendations.

Chapter 5

Empirical Analyses, Observations and Discussion

Introduction

Participatory Forestry (PF) may be regarded as the dominant current forestry practice in Bangladesh, which is the outcome of a progressive succession of strategies for rehabilitating the degraded forests of the country, and, to make the achievement sustainable through effective people's participation. The forestry development initiatives carried out so far in Bangladesh span the mountainous region of the country where indigenous people are the main inhabitants. This Chapter deals with the in-depth empirical study of selected PF interventions in the CHT of Bangladesh. It focuses on the targeted ethnic communities' participation, and associated socioeconomic and environmental issues. Both government and non-government PF initiatives were studied. The systems and surroundings of PF practices are also given due consideration. This chapter includes empirical analysis of the observations and findings through intensive field study in accordance with the Framework of the Study, as outlined in Chapter 4. An attempt was made to analyse the findings of the study and related analytical discussions under six sub-areas: General Issues, Income Generation, Expenditure Patterns, Participation, and PF Achievements.

General Issues

Before the onset of questionnaire interviewing of the selected PF participants, general observations, reconnaissance, and an overview of the villages studied showed a notable finding; that PF agencies implement PF in CHT through independent organizational attempts. FD and CHTDB did not involve NGOs in their PF practices in CHT. In the same way, NGO agencies conducting PF practices in CHT did not involve FD or CHTDB in their initiatives. Moreover, communicative linkages in FD and CHTDB PF practices were also minimal. Hence, linkages between PF implementing agencies in CHT, particularly GO and NGO linkages, were found to be almost absent. However, GO and NGO involvement in PF practices through development of appropriate connections can play a catalytic role in advancing and strengthening such PF interventions, making this a potential area for future exploration.

58 participants in 9 villages were interviewed. Socio-demographic characteristics (ethnicity, gender, religion, age, household size, and education) of each of the participants were noted (see Appendix A). These characteristics were utilised in two ways: i) gender, ethnicity and religion categories and their age, family size and education level, used to provide an overall picture of PF interventions in CHT (in Tables 5.1.1 and 5.1.3), and ii) organization-wise pictures of the same variables (in Tables 5.1.2 and 5.1.4).

Participants' gender, ethnicity and religion

Of the 58 participants interviewed, 51 of their households were found to be male-headed and 7 female-headed. Community-wise, the breakdown of male and female households is: Marma (Male 31, Female 4), Chakma (Male 8, Female 1) and Tripura (Male 12, Female 2), indicating that both male and female participants were found in PF programmes in CHT. Both male and female PF participation was found in the order Marma > Tripura > Chakma (see Table: 5.1.1).

Table 5.1.1: Ethnicity-wise Gender and Religion of the Participants

Ethnic Group	Gender	Religion		Total	
		Buddhism	Hinduism		
Marma	Male	31	0	31	35
	Female	4	0	4	
Chakma	Male	8	0	8	9
	Female	1	0	1	
Tripura	Male	2	10	12	14
	Female	0	2	2	
Total		46	12	58	

Among the 7 female-headed households, 6 were previously male-headed and after the death of husband, the wife became the household head. In the case of the remaining female-headed household, it was found that the husband was disabled and incapable of assuming the responsibility of being a household head. In counting under FD, CHTDB and NGO headings, it was found that the percentages of male- and female-headed households were 83.87 and 16.13; 100.00 and 0.00; 86.67 and 13.33, respectively (as shown in Table 5.1.2). This implies that the participants from all three communities in the study involved in PF in CHT are male dominated or predominantly male administered households. Community tradition, with the husband the main focal point in families, has similarly been reflected, though the female members of the family were found to play vital roles in agriculture and associated farming activities. In both the GO and NGO cases, male-

and female-headed households exist, whatever the reason may be, though the number of female-headed households are comparatively less in both cases. Thus, it can be inferred that gender issues were not given due importance in all cases.

In the case of ethnicity, in all 9 villages, the three principal low hill-dwelling communities, the Chakma, Marma and Tripura, were found to be involved in PF independently and/or on a mixed-community basis. Marma–Tripura, Chakma–Marma, and Chakma–Tripura were found to be living together in the same villages. Participants from the Tripura community were found to be greater in number in Khagrachari, as were Marma in Bandarban. All the three communities were found doing PF in all the three districts, but Marma were highest in number, followed by Tripura and then Chakma (as shown in Table 5.1.1). Counted in accordance with FD, CHTDB and NGO interventions, it was found that the community participation percentages were Marma 80.65; Tripura 19.35 and Chakma 0.00; Marma 41.69; Tripura 25.00; Chakma 33.33; and Marma 33.33, Tripura 33.33 and Chakma 33.33, respectively (as shown in Table 5.1.2). This indicates that there were differences in the respective numbers of community involvement amongst the PF implementing organizations, but the overall descending order of the three communities involved in PF in CHT is Marma>Tripura>Chakma.

According to BBS (2001), the Marma population is greater in Bandarban. Consequently, the number of Marma participants in villages located in Bandarban was found to be higher in number. Similarity also exists in the case of the Tripura community, as Tripura participants were found to be greater in number in villages under Khagrachari District. However, dissimilarity was found in the case of the Chakma community, as the number of participants was found to be less, even in Rangamati District, though according to BBS (1991, 2001a), the highest population in CHT on community basis is Chakma who live in the highest concentration in Rangamati. Participants from different communities found in the same villages are an indication of mixed-community existence in CHT. According to Gain (2000: 8), in CHT within one *mouza*, one may find four community groups, speaking completely different languages, building different types of houses, wearing different clothing, and following different customs and religions.

Among the ethnic communities of CHT, mainly the low hill dwellers are involved in PF. Chakma and Marma fall under *Khyoungtha* group, mostly living along river banks, and Tripura under *Toungtha* group, who though fall under a hill-dwelling category, are also a low hill dwellers in CHT. During the field study, general observation of the involvement of community members in PF revealed

that excluding Mru and Bawm, all the other high hill dwellers remain uninvolved in PF and are practicing *jhuming* in the high hill areas. This study covers the three principal low hill dwelling communities Chakma, Marma and Tripura.

In the case of religion, out of 58 participants 46 were found to be Buddhist and the remaining 12 Hindu. This indicates that Universalistic Religions were followed by the participants in PF in all 9 villages comprising FD, CHTDB and NGO interventions. All the participants from Chakma and Marma communities were Buddhist, and of the 12 participants from the Tripura community 10 were Hindu (see Table 5.1.1). This is an indication that communities kept their original beliefs in such a strong position that other religions could not penetrate. A striking feature is that Christianity, though falling under the category Universalistic Religion, was not found in the study villages. It may be mentioned here that Christianity does dominate some of the high hill dwelling communities, yet the Chakma, Marma and Tripura communities in this study remained devoted to their ancient faiths.

Again, counted as FD, CHTDB and NGO cases, it was found that the percentage of Buddhist and Hindu participants are 80.65 and 19.35; 91.67 and 8.33; and 66.67 and 33.33, respectively (as shown in Table 5.1.2). The selection of participants was made irrespective of religious consideration.

Participant Age, Family Size and Education

Participant ages ranged from 21 to 75 years (see Appendix A). Among the 58 participants, 57 fell under the age range 21-60, the remaining one being 75 years old. The age range 21-60 represents an active and workable age range. Within this workable age range, the highest number of participants fell under the age group 31-40, followed by 41-50, then 51-60, and then 21-30, with the one 75-year old participant placed in the 60+ level (see Tables 5.1.3 and 5.1.4). This indicates that in selecting participants for PF projects, participants of a workable age were given priority by the participating agencies.

Again, if we look at the age group distribution within the 9 study villages in Table 5.1.4, there is no sequential distribution in regards to age, but in all cases higher ages were discouraged. It is mentionable here that though in Gasbow and Kibukpara villages the age group was higher, in reality during the emergence of the project the participants fell in the age ranges 31-40 and 41-50. Counted as FD, CHTDB and NGO interventions separately, FD and CHTDB interventions represent all but the 60+ age bracket, and NGO interventions cover all age ranges, indicating that NGOs are more open to considering

comparatively aged farmers as participants. However, there was no common or similar criterion about age in selecting participants by the three participating agencies. Regardless, more or less middle- and workable-aged participants were given more importance.

Among all participants, family sizes range from 3 to 9 members (see Appendix A). Grouping them in three classes, of 2-4, 5-6, and above 7 members, as small, medium and large respectively, it was found that the medium family size was present in all villages, with small size present in 6 villages and large size present in 5 villages (see Tables 5.1.3 and 5.1.4). Of participants in the 51-60 years age range, 1, 7 and 3 participants were found having small, medium and large family sizes respectively. Moreover, out of all 58 participants, 11 (18.97%) were found to have large size families. This indicates that PF awareness activities had a positive impact on participants' family planning, with than 80 percent of them having small and medium family sizes. Again, according to implementing agency, family size percentages were 35.49 small, 51.61 medium, and 12.90 large for FD, 0.0, 58.33, and 41.67 for CHTDB, and 40, 46.67, and 13.33 for NGO. From these results, we can extrapolate that in both GO and NGO cases, participants preferred medium families of 5 to 6 members.

Table 5.1.2: Organization-wise Participant Categories in 9 Villages of the Chittagong Hill Tracts

Organization	Village	Gender			Ethnicity				Religion		
		Male	Female	Total	Marma	Chakma	Tripura	Total	Buddhism	Hinduism	Total
FD	Longodu	6 (100)	0 (0)	6 (100)	6 (100)	0 (0)	0 (0)	6 (100)	6 (100)	0 (0)	6 (100)
	Alotila	5 (71.43)	2 (28.57)	7 (100)	1 (14.29)	0 (0)	6 (85.71)	7 (100)	1 (14.29)	6 (85.71)	7 (100)
	Babupara	7 (70)	3 (30)	10 (100)	10 (100)	0 (0)	0 (0)	10 (100)	10 (100)	0 (0)	10 (100)
	Banifulpara	8 (100)	0 (0)	8 (100)	8 (100)	0 (0)	0 (0)	8 (100)	8 (100)	0 (0)	8 (100)
	Total	26 (83.87)	5 (16.13)	31 (100)	25 (80.65)	0 (0.00)	6 (19.35)	31 (100)	25 (80.65)	6 (19.35)	31 (100)
CHTDB	Kibukpara	7 (100)	0 (0)	7 (100)	5 (71.43)	2 (28.57)	0 (0)	7 (100)	7 (100)	0 (0)	14 (100)
	Gasbow	5 (100)	0 (0)	5 (100)	0 (0)	2 (40)	3 (60)	5 (100)	4 (80)	1 (20)	5 (100)
	Total	12 (100)	0 (0.00)	12 (100)	5 (41.67)	4 (33.33)	3 (25.00)	12 (100)	11 (91.67)	1 (8.33)	12 (100)
NGO	Dulochari	4 (80)	1 (20)	5 (100)	0 (0)	5 (100)	0 (0)	5 (100)	5 (100)	0 (0)	5 (100)
	Kemalongpara	4 (80)	1 (20)	5 (100)	5 (100)	0 (0)	0 (0)	5 (100)	5 (100)	0 (0)	5 (100)
	Mathaipara	5 (100)	0 (0)	5 (100)	0 (0)	0 (0)	5 (100)	5 (100)	0 (0)	5 (100)	5 (100)
	Total	13 (86.67)	2 (13.33)	15 (100)	5 (33.33)	5 (33.33)	5 (33.33)	15 (100)	10 (66.67)	5 (33.33)	15 (100)
Organization Total		51 (87.93)	7 (12.07)	58 (100)	35 (60.34)	9 (15.52)	14 (24.14)	58 (100)	46 (79.31)	12 (20.69)	58 (100)

FD=Forest Department, CHTDB= Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Table 5.1.3: Age Group-wise Family Size and Education Levels of Participants

Family Size			Education Level				Total
			Illiterate	Class 1-3	Primary	Secondary	
Small	Age Group	(21-30 Years)	1 (16.70)	1 (16.70)	3 (50.00)	1 (16.70)	6 (100)
		(31-40 Years)	1 (14.30)	2 (28.60)	1 (14.30)	3 (42.90)	7 (100)
		(41-50 Years)	1 (33.30)	1 (33.30)	1 (33.30)	0 (0.00)	3 (100)
		(51-60 Years)	0 (0.00)	1 (100)	0 (0.00)	0 (0.00)	1 (100)
	Total		3 (17.60)	5 (29.40)	5 (29.40)	4 (23.50)	17 (100)
Medium	Age Group	(21-30 Years)	0 (0.00)	0 (0.00)	3 (75.00)	1 (25.00)	4 (100)
		(31-40 Years)	0 (0.00)	8 (72.70)	2 (18.20)	1 (9.10)	11 (100)
		(41-50 Years)	2 (25.00)	2 (25.00)	2 (25.00)	2 (25.00)	8 (100)
		(51-60 Years)	0 (0.00)	5 (71.40)	1 (14.30)	1 (14.30)	7 (100)
	Total		2 (6.70)	15 (50.0)	8 (26.70)	5 (16.70)	30 (100)
Large	Age Group	(31-40 Years)	0 (0.00)	3 (60.00)	1 (20.00)	1 (20.00)	5 (100)
		(41-50 Years)	1 (50.00)	0 (0.00)	1 (50.00)	0 (0.00)	2 (100)
		(51-60 Years)	0 (0.00)	1(33.30)	2 (66.70)	0 (0.00)	3 (100)
		(60+)	1 (100)	0 (0.00)	0 (0.00)	0 (0.00)	1 (100)
	Total		2 (18.20)	4 (36.40)	4 (36.40)	1 (9.10)	11 (100)
Total			7 (12.07)	24 (41.38)	17 (29.31)	10 (17.24)	58 (100)

Values in parenthesis indicate percentage.

In case of education of participating farmers, it was found that out of 58 participants, 7 were illiterate, 24 claimed they were not illiterate as they studied up to class 1-3, 17 finished the primary level, and the remaining 10 completed secondary school (see Table 5.1.3). The claim of not being illiterate from reading up to class1-3 is a positive indication of awareness about literacy, which may be interpreted as a result of awareness building through participation in PF. Only 12.07 percent of participants were found to be illiterate, indicating that participants understood the awareness messages stressing the importance of education for their well being. Most of GO participants had education levels from illiterate to primary, while secondary level education almost solely belongs to NGO participants, though the level ranges from illiterate to secondary. Hence, this indicates that older participants were comparatively less educated. NGO participants had comparatively higher levels of education than those of FD and CHTDB.

Table 5.1.4: Family Size, Age and Education Level of Participants in 9 Villages of the Chittagong Hill Tracts

Organization	Village	Family Size (Number of family members)			Age Group (Years)					Education Level				Total
		Small (2-4)	Medium (5-6)	Large (7 & Above)	(21-30)	(31-40)	(41-50)	(51-60)	(60+)	Illiterate	Class 1-3	Primary	Secondary	
FD	Longodu	3 (50)	3 (50)	0 (0)	1 (16.67)	3 (50)	2 (33.33)	0 (0)	0 (0)	1 (16.67)	0 (0)	4 (66.67)	1 (16.67)	6 (100)
	Alotila	4 (57.14)	2 (28.57)	1 (14.29)	3 (42.86)	3 (42.86)	0 (0)	1 (14.29)	0 (0)	0 (0)	5 (71.43)	2 (8.57)	0 (0)	7 (100)
	Babupara	3 (30)	4 (40)	3 (30)	2 (20)	6 (60)	2 (20)	0 (0)	0 (0)	2 (20)	6 (60)	1 (10)	1 (10)	10 (100)
	Banapulpara	1 (12.50)	7 (87.50)	0 (0)	1 (12.50)	5 (62.50)	1 (12.50)	1 (12.50)	0 (0)	2 (25)	5 (62.50)	0 (0)	1 (12.50)	8 (100)
	Total	11 (35.49)	16 (51.61)	4 (12.90)	7 (22.58)	17 (54.84)	5 (16.13)	2 (6.45)	0 (0)	5 (16.13)	16 (51.61)	7 (22.58)	3 (9.68)	31 (100)
CHTDB	Kibukpara	0 (0)	6 (85.71)	1 (14.29)	0 (0)	0 (0)	3 (42.86)	4 (57.14)	0 (0)	0 (0)	4 (57.14)	3 (42.86)	0 (0)	7 (100)
	Gasbow	0 (0)	1 (20)	4 (80)	0 (0)	1 (20)	1 (20)	3 (60)	0 (0)	0 (0)	2 (40)	3 (60)	0 (0)	5 (100)
	Total	0 (0)	7 (58.33)	5 (41.67)	0 (0.00)	1 (8.33)	4 (33.33)	7 (58.33)	0 (0)	0 (0)	6 (50)	6 (50)	0 (0)	12 (100)
NGO	Dulochari	2 (40)	1 (20)	2 (40)	0 (0)	3 (60)	1 (20)	0 (0)	1 (20)	2 (40)	0 (0)	1 (20)	2 (40)	5 (100)
	Kemalongo para	0 (0)	5 (100)	0 (0)	0 (0)	1 (20)	2 (40)	2 (40)	0 (0)	0 (0)	2 (40)	1 (20)	2 (40)	5 (100)
	Mathaipara	4 (80)	1 (20)	0 (0)	3 (60)	1 (20)	1 (20)	0 (0)	0 (0)	0 (0)	0 (0)	2 (40)	3 (60)	5 (100)
	Total	6 (40)	7 (46.67)	2 (13.33)	3 (20.00)	5 (33.33)	4 (26.67)	2 (13.33)	1 (6.67)	2 (13.33)	2 (13.33)	4 (26.67)	7 (46.67)	15 (100)
Organization Total	17 (29.31)	30 (51.72)	11 (18.97)	10 (17.24)	23 (39.66)	13 (22.41)	11 (18.97)	1 (1.72)	7 (12.07)	24 (41.38)	17 (29.31)	10 (17.24)	58 (100)	

FD=Forest Department, CHTDB= Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Land Tenure Status

Two types of land tenure, private property and leasehold, were found in GO and NGO PF villages. Government agencies targeted landless *jhumias* and settled them on USF land, and therefore, the issue of providing land tenure is addressed by leasehold type. Among the four FD villages, in three of them, namely Longodu, Alotila and Banapulpara, agreement deed letters were signed and distributed to the participants giving users rights as settled farmers on USF land. Moreover, the oldest village, Longodu, was granted leasehold ownership by the revenue department, with the other three villages yet to receive the same. The remaining village, Babupara, being situated on reserved forest cannot be provided with leasehold tenure, but agreement deeds were already distributed.

CHTDB also targeted landless *jhumias* and provided settlements on USF land under the Upland Settlement Project. The participants of the 1st phase of the project in Gasbow village got an agreement deed from CHTDB as well as leasehold land tenure from the revenue

department. The other village, Kibukpara, did yet receive an agreement from CHTDB, which is the vital document required to apply to the revenue department for leasehold tenure. Agreement deed finalisation for Kibukpara was found to be in process at the time of study.

Table 5.2.1: Organization-wise Land Tenure Status in 9 Villages of the CHT

Organization	Village	Land Status	Ownership	Deed
FD	<i>Longodu</i>	USF	Done	Done
	Alotila	USF	–	Done
	Babupara	RF	–	Done
	Banifulpara	USF	–	Done
CHTDB	Kibukpara	USF	–	–
	Gasbow	USF	Done	Done
NGO	Dulochari	Private Land	Done	–
	Kemalongpara	Private Land	Done	Done
	Mathaipara	USF	–	Done

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization.

In the case of NGOs, Jabarang targeted the *jhumia* farmers who possessed land provided to them for *jhuming* on USF land under the traditional system of land allocation for *jhuming*, allotted by the respective headmen of the locality. Therefore, no question of deed and/or leasehold land tenure arose yet. In the other two NGO interventions, in Dulochari and Kemalongpara, the targeted participants are from private lands, and as such the participants hold private property land tenure. Hence, the mode of agreement deed between the participants and the participating agency was mainly based on land tenure status and benefit sharing.

Providing land user rights for the FD and CHTDB participants through agreement letters by permitting settlement for residing and carrying out farming practices was an indication of government intention to provide land tenure. The fact that participants from Longodu and Gasbow villages received leasehold tenure rights from the revenue department demonstrated finalisation of the said intention in these two particular cases, and the same process is in the pipeline for the other villages. Targeting traditional-allocated *jhum* land holders and private land holders by the NGOs was an indication of the intention of both the GO and NGO agencies to spread PF developments to cover both types of land tenure in CHT.

Land use

Through reconnaissance survey and empirical field observations it was found that in all FD, CHTDB and NGO interventions, participants carried out land use practices that can be denoted as Forestry or

Woodlot plantation, Agro-forestry, pure Agriculture, land for Homestead use, and occasionally, land used for pure Bamboo patches.

Among the 9 villages investigated, only four were found using land for Bamboo cultivation. These were Alotila, Dulochari, Babupara and Mathaipara villages, having 0.09ha, 0.39ha, 0.20ha and 0.45ha of land used for Bamboo cultivation, respectively. In Dulochari, people cultivate Bamboo in their own land, while in Alotila, Babupara and Mathaipara, GO and NGO participants cultivate in their allotted lands, and occupied *jhum* lands, respectively. From this, it can be observed that Bamboo cultivation is a land use practice in CHT, practiced by general villagers as well as villagers of GO and NGO PF interventions, but not widespread as a common land use practice.

On the other hand, land used as Forestry, Agro-forestry and Agriculture was found to be very common in all the 9 villages. Moreover, observations in and around the system and surroundings showed that in almost all the areas where low hill dwellers, particularly Chakma, Marma, and Tripura, are residing, the use of land for Forestry, Agro-forestry, Horticulture and Agriculture is common practice. Table 5.2.2 shows the land use, on average, for the nine FD, CHTDB and NGO villages studied under this research program. Though the land use practices were found to be common, the areas under particular land uses varied. Moreover, NGOs targeted villagers and occupied *jhum* land holders. Therefore, in NGO cases, the intensity of particular land uses varied widely.

The type of land use was influenced by physical conditions of each location. On steep slopes and hill tops, forestry was a general practice, with agro-forestry covering most of the gentle slopes. Agriculture was found to be mainly practiced on the flat land around hills and valleys. It is mentionable here that around homesteads, and in all areas irrespective of slopes, agri-crops that are generally cultivated by the indigenous people in *jhum* land were seen cultivated in almost all available spaces. Therefore, the whole area in general terms may be regarded as an agro-forestry zone with varying intensity. Forestry, agro-forestry and agricultural areas were distinguished based on on-sight assessment of the presence of a particular category of species in a dominant form that verified a given land was under that particular land use.

In regard to homesteads, in FD villages participants were allotted 0.20 hectares of land each. In Longodu and Alotila, housing made by thatching in both plain and matchang form was seen. Originally, during

the project period, all the houses were built by FD in the *matchang* design, but in the course of time some were changed to plain style. In FD villages, homesteads were built in hill tops and/or adjacent slopes. Houses were made by thatching, bamboo and wood. In CHTDB villages, bamboo and wooden houses were seen, not in clusters like FD villages, but in a sporadic arrangement, with a comparatively much longer distance from one household to another. In NGO targeted villages, houses were built on the low hills or in plains and valleys, mostly made by bamboo and wood, but semi-*pacca* houses were seen. This indicates that government interventions settled the *jhumia* farmers in the hills as they prefer to have homes made on hill tops and slopes, which is consistent with their tradition. However, in the case of NGOs, as private lands were the main target, and most of the private lands were in the low hills or plains or valleys, houses were naturally found those areas as well. Comparatively rich private land holders possessed semi-*pacca* houses and the areas of their homesteads were also comparatively larger.

Table 5.2.2: Average Land (ha) under Different Uses in 9 Villages of the CHT

Organization	Village	Wood lot	Agro-forestry	Homestead	Agriculture	Bamboo	Total
FD	Longodu	0.91 (45.05)	0.51 (25.25)	0.2 (9.90)	0.4 (19.80)	0 (0.00)	2.02 (100)
	Alotila	0.87 (43.07)	0.46 (22.77)	0.2 (9.90)	0.4 (19.80)	0.09 (4.46)	2.02 (100)
	Babupara	0.91 (45.05)	0.81 (40.10)	0 (0.00)	0.1 (4.95)	0.2 (9.90)	2.02 (100)
	Banifulpara	1.21 (59.90)	0.44 (21.78)	0.2 (9.90)	0.17 (8.42)	0 (0.00)	2.02 (100)
CHTDB	Kibukpara	1.62 (76.06)	0.4 (18.78)	0.11 (5.16)	0 (0.00)	0 (0.00)	2.13 (100)
	Gasbow	1.62 (64.03)	0.81 (32.02)	0.1 (3.95)	0 (0.00)	0 (0.00)	2.53 (100)
NGO	Dulochari	0.41 (20.20)	0.33 (16.26)	0.2 (9.85)	0.7 (34.48)	0.39 (19.21)	2.03 (100)
	Kemalongpara	1.46 (48.03)	0.5 (16.45)	0.2 (6.58)	0.88 (28.95)	0 (0.00)	3.04 (100)
	Mathaipara	0.5 (11.99)	3.22 (77.22)	0 (0.00)	0 (0.00)	0.45 (10.79)	4.17 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Discussion of General Issues

The above findings showed that by all three PF agency types (FD, CHTDB and NGO), only male participants were selected. The female participants found during study were either in the participant position because their husband had either died or was incapable of running a family. However, whatever the case may be, the numbers of female-headed households were few in both GO and NGO projects. Moreover, community-wise numbers of female-headed households showed little difference, indicating that traditional features of male dominated families of the Chakma, Marma and Tripura communities were reflected in the PF villages of CHT. It may be mentioned here that in recent PF practices in the plain land areas of the country, for example, the Forestry Sector Project of the Bangladesh Forest Department, both husband and wife were taken as joint participants. Accordingly, in future PF project formulation for indigenous communities, whether the gender issue will be given priority and women will be taken as participants or not may be a policy issue. If so, in order to discover the most effective means of incorporating and adjusting gender equity with the indigenous tradition and culture of each community needs in-depth study.

Both independent and mixed-community based participation were found in the study villages of all three intervening agencies. The fact that all PF community members were living in harmony was an indication of the broader existence of such mixed-community relationships in the low hill-dwelling areas of CHT generally. This signifies that all the participating agencies selected participants irrespective of community consideration or bias. However, significant mixed-community participation was not found in any of the projects as one ethnic community was predominant in each village.

The Chakma community members were found to have lower participation in comparison to Marma and Tripura. Marma were found to be more in number, particularly in Bandarban, and that Tripura in Khagrachari, inferring consistency with the statistics that Bandarban is more populated by the Marma, and Khagrachari more populated by the Tripura. Although, in Rangamati, known for being more populated by the Chakma community, Chakma were found to have low participation, showing inconsistency with the population data. Hence, whether mixed-community participation will be encouraged or not and what steps should be taken to involve more Chakma community members in PF, as well as ways and means to implement these changes, should be explored through in-depth studies.

It was found that participating agencies selected participants irrespective of indigenous community. Looking at the percentages, a few variations of mixed community participation between the three intervening agencies (FD, CHTDB, and NGOs) were found. Due to this, and also due to communities' strong status in maintaining their own religious beliefs, with almost all participants from the Tripura community found to follow Hinduism and Chakma and Marma following Buddhism, we can infer a strong relationship between ethnicity and religion of participants. Though mixed-communities with mixed religious beliefs existed, religious harmony was present. Communities were found performing their own religious activities, and inviting and entertaining other communities as well, which is an indication of the existence of religious harmony in PF villages in CHT.

Both the young and older aged participants were found in FD, CHTDB and NGO villages. The age range showed that all age groups were included, but workable aged participants were preferred by all three agencies. Most of the aged participants were found to be illiterate or had only studied up to class 1-3, making them comparatively less educated. Again, most of the aged, illiterate and less educated participants had small and medium size families. This indicates that less educated participants were aware about the importance of keeping their family size reasonable. On the other hand, through observations and general discussions with participants and key informants, it was revealed that participants desired more children so that they would be able to engage them in farm work in the future. Participants also recognised the need for family planning, yet demanded other avenues for income generation along with farming practices. Considering the above facts, which policy, criteria and activities will be undertaken in the future should be designed accordingly.

Income Generation

Income of the participants

In regards to the economic conditions of the projects, it was found that all the participants benefited from the PF practices by receiving increased incomes to support their livelihoods. Their average yearly income increased manifold. Table 5.3.1 shows the village-wise average yearly incomes before PF project interventions compared with their farm and off-farm incomes during this field study. Farmers of NGO villages were found to be receiving more income than those of GO villages, which may be due to the fact that the landless *jhumias* were

poorer than the previously settled farmers in the NGO villages. This also explains the comparatively higher average yearly incomes of NGO participants before project interventions. Farmers in all the GO and NGO villages received mentionable farm as well as off-farm income, which is an indication of their affirmative involvement in farming practices as well as their tendency to explore other income sources as and when available and possible. Another general observation was that participants of longer established villages had higher yearly incomes than farmers from more recently settled ones, though Alotila and Mathaipara may be regarded as exceptions. Older villages had comparatively more mature forest and fruit tree resources and thereby received more income.

The participants in Alotila were found to not be in a harmonious relationship with each other, particularly the female participants whose husbands had died and thus they were the heads of households. In this village, out of the 7 participants interviewed, 6 were from the Tripura community. Tripura societies are male dominated and two women without their husbands expressed that they felt insecure in performing large-scale farming practices. During interviews, the women firmly related that if they plant vegetables they may not be able to harvest them due to theft that frequently occurred, arranged and carried out by their neighbours. Additionally, sometimes their trees and bamboos were stolen by the neighbours. The women conveyed that they cannot protect their crops as there is no male family member and thus these women mostly depend on off-farm income.

This above-mentioned case was found to be the major cause of lower average yearly incomes in Alotila, although the incomes of male headed households were encouraging. The average income in Alotila was comparatively less than that in other PF villages, yet still the average farm income was nearly double, and the average total income was nearly triple, than that before settlement. It is mentionable here that the case of theft and non-cooperation with the widows by the neighbouring male members is an exceptional case. This type of incident was not found in any other PF villages investigated. In other FD villages, average yearly farm incomes, as well as off-farm incomes, were found to be encouraging when compared to those before the start of PF project activities. On the other hand, though recent intervention, higher income in NGO village Mathaipara was due to large scale banana plantation.

Table 5.3.1: Average Annual Income (in Taka) of Participants from 9 Villages of the Chittagong Hill Tracts

Village	Organization	Income Before Rehabilitation	Present Income		
			Farm Income	Off-farm Income	Total
Longodu	FD	15360.00	46420.83 (77.91)	13160.00 (22.09)	59580.83 (100)
Alotila	FD	15240.00	28159.14 (69.91)	12120.00 (30.09)	40279.14 (100)
Babupara	FD	10468.00	42711.00 (68.46)	19680.00 (31.54)	62391.00 (100)
Banifulpara	FD	12240.25	49128.00 (98.18)	910.00 (1.82)	50038.00 (100)
Kibukpara	CHTB	13340.00	51728.57 (79.78)	13111.43 (20.22)	64840.00 (100)
Gasbow	CHTB	11280.00	99229.60 (70.36)	41800.00 (29.64)	141029.60 (100)
Dulochari	NGO	91400.00	96232.00 (57.41)	71400.00 (42.59)	167632.00 (100)
Kemalongpara	NGO	17855.60	57215.00 (85.88)	9408.00 (14.12)	66623.00 (100)
Mathaipara	NGO	23978.00	62020.00 (69.67)	27000.00 (30.33)	89020.00 (100)
Total		211161.90	532844.10 (71.87)	208589.40 (28.13)	741433.60 (100)

FD=Forest Department, CHTDDB= Chittagong Hill Tracts Development Board, NGO = Non -Government Organization. Values in parenthesis indicate percentage.

Incomes in Kibukpara and Gasbow, the two CHTDDB PF villages, were found to be higher compared to FD PF villages. This was due to the high price of rubber latex produced from rubber trees. Incomes in Gasbow were found to be more than those in Kibukpara. This is due to the added income of trees and agri-crops, as comparatively more land was provided to the farmers of Gasbow.

In NGO villages, targeted farmers were comparatively rich compared to the *jhumias* rehabilitated by FD and CHTDDB. Hence, there both the average incomes before project and during project were found to be higher than those in GO cases.

Total incomes of the participants include the proceeds from farming added with the earnings from other sources. The major source of off-

farm income was from daily wage labour in the surrounding *jhum* fields. Of the 58 participants, 51 were found to be working as wage labourers. They were mostly from the FD and CHTDB villages, but included NGO villagers. Among the remaining 7 participants, 4 participants from Dulochari and Mathaipara NGO villages were found working as small businessmen as middlemen for timber permit and fruit trading businesses; 2 participants serve as Watcher and Tapper in the Kibukpara CHTDB village; and the last 1 participant from Alotila FD village earned off-farm income as a rickshaw puller.

The average of the total off-farm income of participants varies widely among the study villages (see Table 5.3.1), as was found in case of on-farm income also. Yearly off-farm average incomes of FD villages Longodu, Alotila, and Babupara were Tk. 13,160, Tk. 12,120 and Tk. 19,680, respectively, which form a wide contrast with Banifulpara FD village's Tk. 910. This is an indication of the variation of availability, willingness and necessity of working for off-farm income in the different villages. Banifulpara participants have farm income similar to the farm income of Longodu and much more than that of Alotila. We can extrapolate here that Banifulpara participants performed their farming practices well and were reluctant and/or found it unnecessary to work as wage labourers for other land holders. Observations in the areas surrounding Banifulpara village revealed that participants performed farming in the settled areas, and also did their own *jhuming* in the surrounding government lands. Therefore, the need to work as labour for other landholders was negligible. Contrastingly, in CHTDB village Kibukpara, the off-farm income was not less though there was government land under participants' possession for *jhuming* in the areas adjacent to where the farmers were settled through the projects. Again, farmers from the NGO village Kemalongpara had lower off-farm incomes as they had land, in excess of the land allocated for project practices, in their possession in their village where they performed their own cultivation that in turn reduced their need to work as wage labourers. Similar conditions also exist in the other two NGO villages, but the high range of average total off-farm incomes in these two villages can be explained by the added contribution of business income for 4 participants as stated earlier in this section.

As outlined in Table 5.3.1, the average annual total incomes of the participants of all the 9 PF villages studied were found to be much higher than the incomes before the commencement of the projects.

Overall, incomes increased manifold (3.69 times) due to PF project interventions (see Table 5.3.2). Counted as FD, CHTDB and NGOs, incomes of the participants increased 4.14, 7.74 and 2.43 times, respectively, compared to incomes before the projects. This indicates that the increase in average annual incomes of FD and CHTDB participants were respectively 1.71 and 3.19 times that of NGO participants. This is attributable to the fact that GO participants had no farming income prior to project commencement, whereas the NGO participants already had their own farming lands, where, during project interventions, improved farming practices were initiated. Between GO participants, CHTDB participants' average annual income was notably higher (1.87 times more) than that of FD participants. This was due to the added higher income from selling rubber latex in the CHTDB case.

Table 5.3.2: Organization-wise Average Annual Income of Participants (in Taka)

Organization	Income Before Project	Present Income			Relative Income (Income Before Project = 100)
		Farm Income	Off-farm Income	Total Income	
FD	12949.74	41799.13 (77.89)	11867.10 (22.11)	53666.23 (100)	414.42
CHTDB	12481.67	71520.67 (74.05)	25065.00 (25.95)	96585.67 (100)	773.82
NGO	44411.20	71822.33 (66.65)	35936.00 (33.35)	107758.33 (100)	242.64
Total	69842.61	185142.13 (71.76)	72868.10 (28.24)	258010.23 (100)	369.42

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Income Variations among Organizations

For all the three intervening agencies (FD, CHTDB and NGO), variations were found in participants' average annual income before PF and current annual income (farm and off-farm income), as shown in Table 5.3.3. Assessment of the variations showed that, in the case participants' income before project interventions, the beneficiaries of NGOs were earning higher average incomes than those of FD and CHTDB. The income pattern showed that the beneficiaries under NGO projects were receiving a mean annual income of Tk. 44,411.20, which was significantly ($P \leq 0.001$) higher than that of the beneficiaries of FD (Mean Tk. 12,949.74) and CHTDB (Mean Tk. 12,481.67). Between FD and CHTDB villages no significant difference was observed. This

indicates that FD and CHTDB targeted significantly lower income participants than NGOs.

Incomes of GO and NGO participants in PF villages are comprised of both farm and off-farm income. Variations in both the farm and off-farm income were visible, which obviously resulted in variations in total income. The income patterns showed that the farm income of beneficiaries under FD (Mean Tk. 41,799.13) was significantly lower ($P \leq 0.001$) than that of CHTDB (Mean Tk. 71,520.67) and NGO (Mean Tk. 71,822.33) beneficiaries. Off-farm income of FD beneficiaries (Mean Tk. 11867.10) was significantly lower ($P \leq 0.01$) than that of NGO beneficiaries (Mean Tk. 35936.00). Meanwhile, the off-farm income CHTDB beneficiaries (Mean Tk. 25,065.00) fell in the middle, having a significantly higher mean income compared to FD, and an insignificantly lower mean income compared to NGOs. As a result, the average total income of beneficiaries in FD villages (Mean Tk. 53,666.23) was significantly lower ($P \leq 0.001$) than that of beneficiaries of CHTDB (Mean Tk. 96585.67) and NGOs (Mean Tk. 107758.33). We can see that comparatively, farm income contributed more than off-farm income. Additionally, variations in income components among the types of beneficiaries were sharply visible.

Table 5.3.3: Variations in Organization-wise Average Annual Income of Participants (in Taka)

Organization	Income Before Project	Present Income		
		Farm Income	Off-Farm Income	Total Income
FD	12949.74 ^b	41799.13 ^b	11867.10 ^b	53666.23 ^b
CHTDB	12481.67 ^b	71520.67 ^a	25065.00 ^{ab}	96585.67 ^a
NGO	44411.20 ^a	71822.33 ^a	35936.00 ^a	107758.33 ^a
F-ratio	7.265 ^{***}	10.060 ^{***}	9.206 ^{***}	3.520 ^{**}

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization, ** = Significant at 0.01 level, *** = Significant at 0.001 level. Superscript with the same letter represented denotes no significant difference.

Relationship Characteristics among the Organizations

All the participants from GO and NGO interventions used land for almost the same forestry, agro-forestry and agricultural practices. All participants experienced a significant increase in income generated both on-farm and off-farm. CHTDB participants had different amounts

of land in their possession during the two phases of the project, and NGO participants had different amounts of land cultivated in project initiatives. Therefore, the existence of any correlation between the income and the amount of land under cultivation by the farmers has been assessed through correlation analysis, as shown in Table 5.3.4.

Table 5.3.4: Correlation between Land and Income of the Participants

Variable	Correlation Coefficient			
	Land (ha)	Income Before Project (Tk.)	Farm Income (Tk.)	Total Income (Tk.)
Total Land	-	- 0.005 ^{NC} (0.968)	- 0.238 ^{LC} (0.072)	0.073 ^{NC} (0.588)
Income Before Project	- 0.005 ^{NC} (0.968)	-	0.265 ^{MC} (0.044)	0.674 ^{SC} (0.000)
Farm Income	0.238 ^{LC} (0.073)	0.265 ^{MC} (0.044)	-	0.789 ^{VSC} (0.000)
Total Income	0.073 ^{NC} (0.588)	0.674 ^{SC} (0.000)	0.789 ^{VSC} (0.000)	-

^{NC} = Negligible correlation, ^{LC} = Low correlation, ^{MC} = Moderate correlation, ^{SC} = Substantial correlation, ^{VSC} = Very strong correlation. Values in parenthesis indicate percentage.

Taking into account all the study villages as a whole (GO and NGO interventions), correlation results between the variables are: Total Land (Mean 2.34; SD 0.708; N 58), Farm Income (55,713.03; SD 30,031.418; N 58) and Total Income (Mean 76,535.45; SD 48,330.376; N 58). These figures show that there was a low relationship between Total Land and Farm Income ($P \leq 0.05$) and a negligible relationship between Total Land and Total Income ($P \leq 0.05$), but a very strong relationship exists between Farm Income and Total Income ($P \leq 0.001$) of the participants. This indicates that irrespective of the amount of farm land, income from farm activities was the main contributor to the total income of the participants. With increased land holdings, the corresponding increase in Farm Income and Total Income were found to be insignificant. Therefore, the effort made by the participants in farming practices played a major role in the amount of income generated.

Moreover, taking into account all the study villages as a whole (GO and NGO interventions), the correlation between the variables, Total

Income (Mean 76,535.45 ; SD 48,330.376 ; N 58) and Income before Project (Mean 20,989.48 ; SD 30,528.672 ; N 58), showed that a substantial relationship exists ($P \leq 0.001$). It infers that the substantial economic upliftment experienced by all GO and NGO participants occurred due to the PF interventions.

As detailed in Table 5.3.5, linear regression analysis between the Farm Income and Total Farm Land; and Total Income and Total Farm Land; taking Total Farm Land as the independent variable, showed an insignificant directly proportional increasing income trend. On the other hand, linear regression analysis between the Farm Income and Total Income, taking Farm Income as the independent variable, showed a significant ($p \leq 0.001$) directly proportional increasing trend (see Table 5.3.5 and Figure 5.3.1d). Accordingly, it can be inferred that, it was the intensity of farming practices, and not an increase in the amount of farm land, which was responsible for generating a significant rise in income for participants.

Table 5.3.5: Relationships between (i) Total Farm Land Area and Farm Income, (ii) Total Farm Land Area and Total Income, (iii) Farm Income and Total Income, and (iv) Total Income and Income before Project

Dependent Variables (Y)	Independent Variables (X)	Regression Equation	R	F	P - value
Farm Income	Total Land	$Y = 32098.835 + 10099.724 X$	0.238	3.367	0.072 ^{NS}
Total Income	Total Land	$Y = 64934.883 + 4961.528 X$	0.073	0.298	0.588 ^{NS}
Total Income	Farm Income	$Y = 5794.509 + 1.270 X$	0.789	92.344	0.000 ^{***}
Total Income	Income before Project	$Y = 54136.083 + 1.067X$	0.674	46.640	0.000 ^{***}

^{NS} = Not significant, ^{***} = Significant at 0.001 level

Moreover, the nature of the economic upliftment of participants, as compared to their income before project interventions was assessed through linear regression analysis that showed a directly proportional significant ($P \leq 0.001$) relationship, as shown in Table 5.3.5 and Fig 5.3.1. Accordingly, this indicates that all GO and NGO PF project interventions have significantly increased the average annual total income (farm income combined with off-farm income) of all the participants concerned. The income of all 58 participants from the 9 study villages increased substantially, showing a positive increasing trend overall.

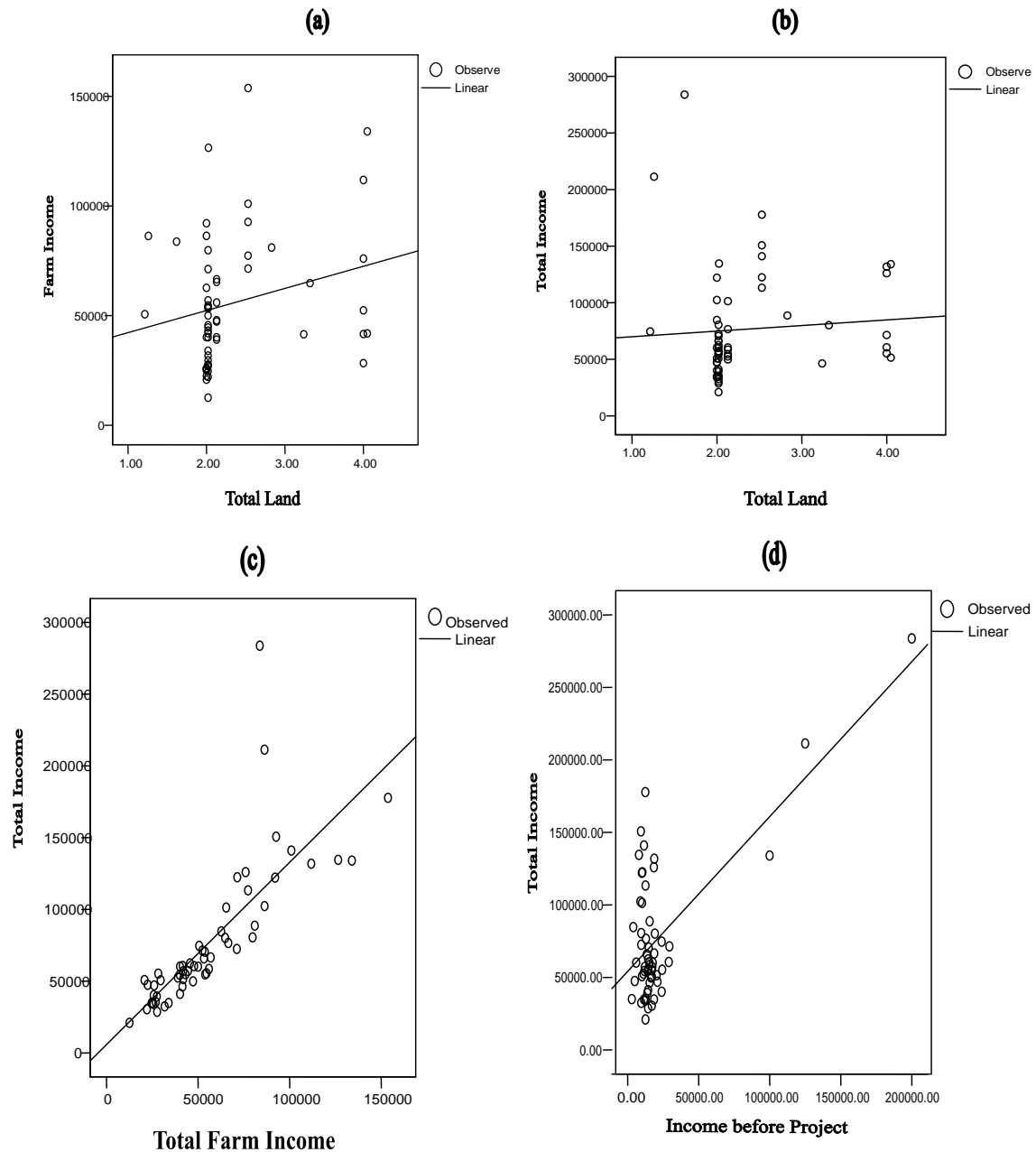


Figure 5.3.1: Regression Models between;

- Total Land and Farm Income,
- Total Land and Total Income;
- Farm Income and Total Income;
- Total Income and Income before Project

Level of Farm Income

The average annual farm incomes of FD, CHTDB and NGO villages have been grouped into five levels (lower, lower middle, middle, higher middle and higher), as shown in Table 5.3.6. Participants in FD villages covered the lower, lower middle and middle levels, with most falling in the lower (Tk 0-35,000) and lower middle (Tk 35,001-

70,000) levels. The CHTDB villages covered the lower middle, middle and higher levels, with most falling in the lower middle (Tk 35,001-70,000) and middle (Tk 70,001-105,000) levels. This indicates that a majority of farmers in GO PF villages receive farming income in the lower levels. On the other hand, farmers in NGO PF villages cover four income groups except the higher level, with the majority falling in the lower middle (Tk 35,001-70,000) and middle (Tk 70,001-105,000) income levels. Thus, it may be inferred that most of the farmers in NGO PF villages receive almost middle level earnings. Overall, this implies that the majority of farmers in FD, CHTDB and NGO PF villages performed farming practices moderately instead of employing their highest capacity and reaching their potential. Therefore, there exists a need to take appropriate measures to involve the farmers to their full potential in farming income generation.

Table 5.3.6: Organization-wise Number of Participants from each of the Five Farm Income Levels

Farm Income Level (in Taka)						
Organization	0-35000 ¹	35001-70000 ²	70001-105000 ³	105001-140000 ⁴	140001-175000 ⁵	Total
FD	14 (45.20)	13 (41.90)	4 (12.90)	0 (0.00)	0 (0.00)	31 (100)
CHTDB	0 (0.00)	7 (58.30)	4 (33.30)	0 (0.00)	1 (8.30)	12 (100)
NGO	1 (6.70)	7 (46.70)	4 (26.70)	3 (20.00)	0 (0.00)	15 (100)
Total	15 (25.86)	27 (46.55)	12 (20.69)	3 (5.17)	1 (1.72)	58 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

^{1, 2, 3, 4, 5} indicate lower, lower middle, middle, higher middle, higher levels respectively

Farm income components

In all the FD, CHTDB and NGO villages, similar farming practices were observed, which included forestry, agro-forestry, agriculture and livestock rearing. The average annual incomes made from these components in the 9 villages are shown in Table 5.3.7. Overall, forestry generated the highest amount of income. Substantial agricultural income was generated in all villages except CHTDB village Kibukpara. All 9 villages earned income from livestock, though no separate land was set aside for livestock rearing.

Table 5.3.7: Component-wise Average Annual Farm Income of Participants in 9 Villages of the Chittagong Hill Tracts (in Taka)

Village	Organization	Forestry	Agriculture	Livestock Rearing	Total Farm Income
Longodu	FD	13577.50 (29.25)	21545.00 (46.41)	11298.33 (24.34)	46420.83 (100)
Alotila	FD	10237.71 (36.36)	15078.57 (53.55)	2842.86 (10.10)	28159.14 (100)
Babupara	FD	20549.00 (48.11)	15842.00 (37.09)	6320.00 (14.80)	42711.00 (100)
Banifulpara	FD	18825.50 (38.32)	18365.00 (37.38)	11937.50 (24.30)	49128.00 (100)
Kibukpara	CHTDB	33380.00 (64.53)	4220.00 (8.16)	14128.57 (27.31)	51728.57 (100)
Gasbow	CHTDB	69073.60 (69.61)	16296.00 (16.42)	13860.00 (13.97)	99229.60 (100)
Dulochori	NGO	23392.00 (24.31)	57480.00 (59.73)	15360.00 (15.96)	96232.00 (100)
Kemalongpara	NGO	16500.00 (28.84)	31835.00 (55.64)	8880.00 (15.52)	57215.00 (100)
Mathaipara	NGO	25200.00 (40.63)	17700.00 (28.54)	19120.00 (30.83)	62020.00(100)
Total		24374.33 (43.75)	20452.67 (36.71)	10886.03 (19.54)	55713.03 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Organization-wise Variations in Farm Income Components

Amongst the three intervening agencies (FD, CHTDB and NGO), variations were found in the farm income components of the participants (Table 5.3.8). Assessment of this variation showed that in case of forestry, the beneficiaries of CHTDB had a mean annual income of Tk 48,252.33, which is significantly

Table 5.3.8: Variations in Farm Income Components between Organizations (in Taka)

Organization	Forestry	Agriculture	Livestock	Total Farm Income
FD	16426.55 ^b	17424.52 ^b	7948.06 ^a	41799.13 ^b
CHTDB	48252.33 ^a	9251.67 ^b	14016.67 ^a	71520.67 ^a
NGO	16334.73 ^b	35671.67 ^a	14453.33 ^a	71822.33 ^a
F-ratio	16.804 ^{***}	15.116 ^{***}	1.960 ^{NS}	9.206 ^{***}

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non -Government Organization.

^{NS} = Not significant, ** = Significant at 0.01 level, *** = Significant at 0.001 level. Superscript with the same letter represented denotes no significant difference.

($P \leq 0.001$) higher than that of the beneficiaries of FD (Tk 16,426.55) and NGO (Tk 16,334.73). Between FD and NGO, no significant difference was observed. This is an indication of a different forestry income pattern of CHTDB compared to the similar income pattern shared by FD and NGO.

In the case of agricultural income, average NGO participant earnings (Mean Tk. 35,671.67) were significantly ($P \leq 0.001$) higher than that of FD (Mean Tk. 17,424.52) and CHTDB (Mean Tk. 9,251.67). Between FD and CHTDB no significant difference was observed. This indicates that NGO participants placed comparatively more emphasis on agricultural income generation than GO participants.

In the case of livestock, no significant differences were observed among FD, CHTDB and NGO agencies, even at $P \leq 0.05$ level. This is an indication of similar interest towards livestock rearing from participants of all three beneficiary types.

Farm Income Component Levels

In order to assess the farm income component levels of FD, CHTDB and NGO participants, the said forestry income, agriculture income and livestock income were divided into five levels: lower (Tk 0-20,000), lower middle (Tk 20,001-40,000), middle (Tk 40,001-60,000), higher middle (Tk 60,001-80,000) and higher (Tk 80,00-100,000), as shown in Table 5.3.9. It can be seen that for forestry, the majority of FD and NGO participants fell in the lower income level, and CHTDB participants in the lower middle level. Thus, it can be inferred that the majority of participants received low level forestry income. This indicates that the majority of both GO and NGO participants did not put such effort into planning and managing forestry practices that would have increased their forestry income.

It is worth mentioning here that the comparatively higher forestry income of CHTDB participants was the result of additional income from the sale of valuable rubber latex in Gasbow village. In the other CHTDB village Kibukpara, the sell of rubber latex has not yet begun, and as such could not generate income, though in the near future it will start, at which point the average income of CHTDB participants as a whole will rise. This indicates that selection of species that yield valuable products, which in turn increase income to a notable extent, is a countable variable for accelerating income generation. It is evident

that there are ways to integrate short-term income generation within long-term forestry practices. For this, species selection is a vital consideration.

Table 5.3.9: Organization-wise Numbers of Participants from each of the Five Divided Farm Income Component levels

Organization	Component	Farm Income Level (in Taka)					
		0-20000 ¹	20001-40000 ²	40001-60000 ³	60001-80000 ⁴	80001-100000 ⁵	Total
FD	Forestry	25 (80.60)	4 (12.90)	0 (0.00)	2 (6.50)	0 (0.00)	31 (100)
	Agriculture	19 (61.30)	11 (35.50)	1 (3.20)	0 (0.00)	0 (0.00)	31 (100)
	Livestock	28 (90.3)	3 (9.70)	0 (0.00)	0 (0.00)	0 (0.00)	31 (100)
CHTDB	Forestry	0 (0.00)	7(58.30)	2(16.70)	2 (16.70)	1 (8.30)	12 (100)
	Agriculture	11 (91.70)	1(8.30)	0(0.00)	0 (0.00)	0 (0.00)	12 (100)
	Livestock	8 (66.70)	4(33.30)	0(0.00)	0 (0.00)	0 (0.00)	12 (100)
NGO	Forestry	10 (66.70)	4(26.70)	0(0.00)	1 (6.70)	0 (0.00)	15 (100)
	Agriculture	3 (20.00)	8(53.30)	3(20.00)	1 (6.70)	0 (0.00)	15 (100)
	Livestock	12 (80.00)	2 (13.30)	0 (0.00)	1 (6.70)	0 (0.00)	15 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

1, 2, 3, 4, 5 indicate lower, lower middle, middle, higher middle, higher levels respectively.

In the case of agriculture, the majority of FD and CHTDB participants received income in the lowest level while NGO participants received lower middle level incomes. However, the agriculture income levels achieved by a few participants (Table 5.3.9) showed that higher level agriculture income was possible. This indicates that the majority of participants did not place appropriate endeavour in practicing agriculture. Comparatively, NGO participants were found to be more interested in practicing agriculture than FD and CHTDB participants (CHTDB < FD < NGO).

Similarly, the majority of FD, CHTDB and NGO participants' livestock income fell under the lower level. However, the possibility of

having higher levels of livestock income was evidenced by the occupation of the lower middle level by some participants.

Relationships among the Farm Income Components

Taking into account all the study villages as a whole, the correlation between variables: Total Farm Income (Mean 55,713.03; SD 30,031.42; N 58), Forestry Income (Mean 24,374.33; SD 20,298.23; N 58), Agricultural Income (Mean 20,452.67; SD 16,135.69; N 58) and Livestock Income (Mean 10,886.03; SD 12,326.24; N 58) showed that there was substantial relationships exist. For instance, there are significant correlations between Total Farm Income and Forestry Income ($P \leq 0.001$), between Total Farm Income and Agricultural Income ($P \leq 0.001$), and between Total Farm Income and Livestock Income ($P \leq 0.001$) of participants (see Table 5.3.10). This indicates that substantial income was generated from all three components of farming practice.

Table 5.3.10: Correlations between Participant Farm Income and its Components

Variable	Correlation Coefficient			
	Forestry Income	Agricultural Income	Livestock Income	Farm Income
Forestry Income	-	- 0.095 ^{NC} (0.477)	0.120 ^{LC} (0.370)	0.674 ^{SC} (0.000)
Agricultural Income	- 0.095 ^{NC} (0.477)	-	0.201 ^{LC} (0.130)	0.555 ^{SC} (0.000)
Livestock Income	0.120 ^{LC} (0.370)	0.201 ^{LC} (0.130)	-	0.599 ^{SC} (0.000)
Farm Income	0.674 ^{SC} (0.000)	0.555 ^{SC} (0.000)	0.599 ^{SC} (0.000)	-

NC = Negligible correlation, LC = Low correlation, SC = Substantial correlation. Values in parenthesis show P-value.

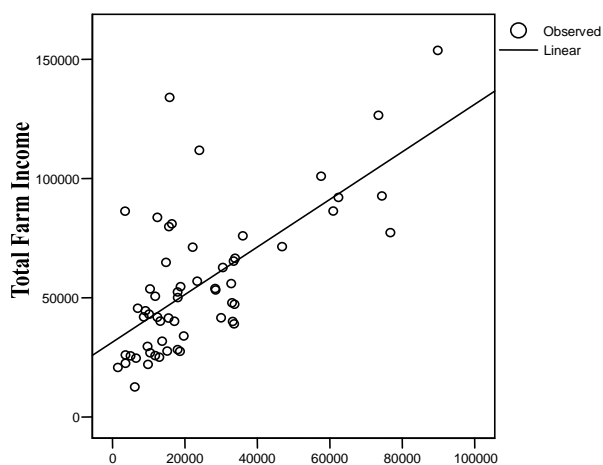
Regression analysis between dependent variable Total Farm Income and independent variables Forestry Income, Agricultural Income and Livestock Income, showed directly proportional significant ($P \leq 0.001$) relationships (see Table 5.3.11 and Figure 5.3.2). Accordingly, it was inferred that as indicated by regression equations and models, all the three components of Farm Income significantly contributed to the participants' annual Farm Income.

Table 5.3.11: Relationships between Farm Income and its Components

Dependent Variable (Y)	Independent Variables (X)	<i>Regression equation</i>	R	F	P-Value
Farm Income	Forestry Income	$Y = 31408.390 + 0.997X$	0.674	46.608	.000***
Farm Income	Agricultural Income	$Y = 34570.238 + 1.034X$	0.555	24.983	.000***
Farm Income	Livestock Income	$Y = 39814.151 + 1.460X$	0.599	31.410	.000***

*** = Significant at 0.001 level

(a)



(b)

(c)

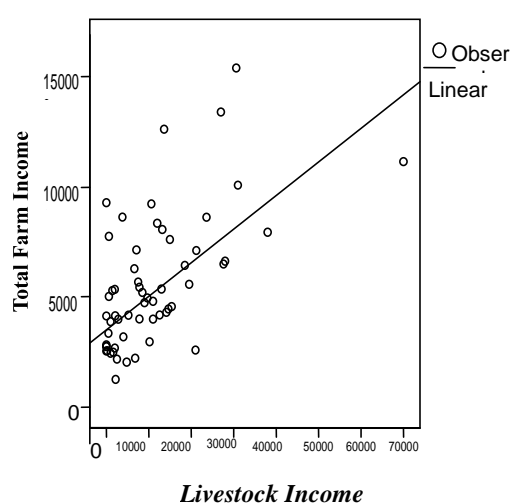
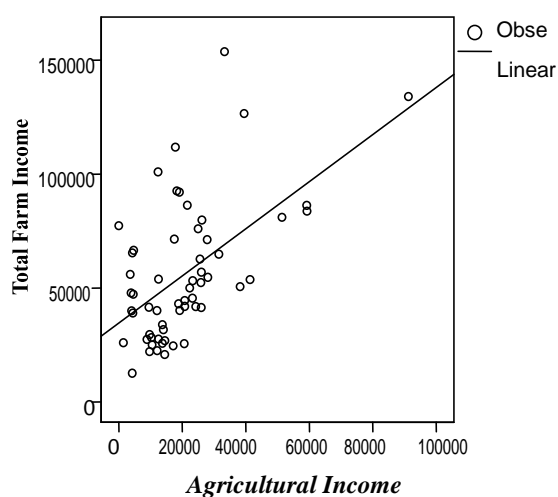


Figure 5.3.2: Regression Models between Total Farm Income and its Components: (a) Forestry Income; (b) Agricultural Income; (c) Livestock Income

Forestry income

The participants' Forestry Income was found to be significant ($P < 0.001$) when counted against the Total Farm Income (see Table 5.3.11). It is important to mention that trees, as perennial crops, need a long time to grow and reach a rotation period. The income figures used in this research are the average annual incomes of the study year.

Forestry Income is broadly comprised of fuel wood, fruit, bamboo and occasionally harvested pole and timber. In the villages under this study, the income generated by forestry was derived mainly from fuel wood, leaves and tugs, poles, timber, fruit and bamboo, which can be broadly classified into Income from Trees, Income from Fruit and Income from Bamboo (as in Table 5.3.12). Except CHTDB village Kibukpara and FD village Babupara, all other villages received Income from Trees. In Kibukpara, the participants mostly planted fruit trees around their homesteads and, therefore, their Forestry Income was mainly comprised of Income from Fruit. Similarly, in Babupara, the Forestry Income was derived from fruit. Bamboo plantations were only found in NGO village Dulochari and FD village Alotila, so the category 'Income from Bamboo' was only relevant to these two villages.

Participants did not carry out any thinning, yet need-based occasional removal of trees worked as a kind of improvised thinning. This practice did not notably hamper the presence of the required number of trees essential for reaching final harvest or rotation time. The final harvesting of trees results in a high income for the participants. As such, though the present forest income levels do not represent high incomes as compared to agriculture and other sources of income, the income from forests after final harvest will naturally exceed all other income sources. This study tried to assess only the interim average annual income from forests during the study period, which fell before forest trees reached the time of final harvest.

Table 5.3.12: Component-wise Average Annual Forestry Income of Participants in 9 Villages of the Chittagong Hill Tracts (in Taka)

Village	Organization	Annual Forestry Income			
		Tree	Fruit	Bamboo	Total
Longodu	FD	626.67 (4.62)	12950.83 (95.38)	0.00 (0.00)	13577.50 (100)
Alotila	FD	3104.86 (30.33)	4282.86 (41.83)	2850.00 (27.84)	10237.71 (100)
Babupara	FD	0.00 (0.00)	20549.00 (100.00)	0.00 (0.00)	20549.00 (100)

Village	Organization	Annual Forestry Income			
		Tree	Fruit	Bamboo	Total
Banifulpara	FD	7628.00 (40.52)	11197.50 (59.48)	0.00 (0.00)	18825.50 (100)
Kibukpara	CHTDB	29160.00 (87.36)	4220.00 (12.64)	0.00 (0.00)	33380.00 (100)
Gasbow	CHTDB	36416.60 (52.72)	32657.00 (47.28)	0.00 (0.00)	69073.60 (100)
Dulochari	NGO	922.00 (3.94)	17470.00 (74.68)	500.00 (21.37)	23392.00 (100)
Kemalongpara	NGO	10000.00 (60.61)	6500.00 (39.39)	0.00 (0.00)	16500.00 (100)
Mathaipara	NGO	0.00 (0.00)	25200.00 (100)	0.00 (0.00)	25200.00 (100)
	Total	87858.13 (38.08)	135027.19 (58.52)	7850.00 (3.40)	230735.31 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Furthermore, this research paper attempted to understand the contribution of this average annual forestry income components to that of the total annual forestry income, and additionally, to assess their nature and any correlation between them. Such assessment will help in evaluating the essentiality of different income-generating elements in forestry development, as well as other needs during the long gestation period of tree growth for the survival and livelihood maintenance of farmers involved in PF activities. These findings may be considered vital for the formulation of policies geared towards forest conservation and sustainable development through PF.

Organization-wise Variation in Forest Income Components

Comparing the Forest Income generated by the three intervening organizations, significant variation was found only in Tree Income (see Table 5.3.13). Assessment of this variation showed that participants in CHTDB villages earned a mean annual income from trees of Tk. 32,183.58, which was significantly ($P \leq 0.001$) higher than participants in FD (Tk. 2,790.90) and NGO (Tk. 3,640.67) villages. Between FD and NGO, no significant difference was observed. This is an indication of the different Tree Income pattern of CHTDB, contrasted with the similar income pattern shared by FD and NGO agencies.

Table 5.3.13: Variations in Components of Forestry Income between Organizations (in Taka)

Organization	Tree	Fruit	Bamboo	Total Forestry Income
FD	2790.90 ^b	12992.10 ^a	643.55 ^a	16426.55 ^a
CHTDB	32183.58 ^a	16068.75 ^a	0.00	48252.33 ^b
NGO	3640.67 ^b	16390.00 ^a	1666.67 ^a	21697.33 ^a
F-ratio	267.730 ^{***}	0.336 ^{NS}	0.791 ^{NS}	16.804 ^{***}

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non -Government Organization. ^{NS} = Not significant, *** = Significant at 0.001 level.

Superscript with the same letter represented denotes no significant difference.

Assessment of the variation in income from fruit shows that the mean annual income of FD participants (Tk 12,992.10) is not significantly different, even at the $P \leq 0.05$ level, to CHTDB (Tk 16,068.75) or NGO (Tk 16,390.00) participants. This indicates that GO and NGO participants employed similar effort in fruit tree cultivation. In the case of income from bamboo, no significant variation was observed between FD (Mean Tk 643.55) and NGO (Mean Tk 1,666.67). In fact, income generated from bamboo was so low that it did not reveal significant variation at the $P \leq 0.05$ level, even with the zero income of CHTDB participants. This indicated that GO and NGO participants practiced almost identical amounts of bamboo cultivation.

Forest Income Component Levels

In order to assess the levels of component contributions to Forestry Income of FD, CHTDB and NGO participants, the said component incomes were divided into five levels. For the Tree Income component, these levels were lower Tk 0-8,000, lower middle Tk 8,001-16,000, middle Tk 16,001-24,000, higher middle Tk 24,001-32,000 and higher Tk 32,000-40,000, as shown in Table 5.3.14. FD and NGO participants' Tree Income fell under the lower and lower middle levels with no appearance in the higher three levels. In contrast, CHTDB participants' Tree Income fell in the higher middle and higher levels, mainly due to the higher income from the sale of rubber latex collected from rubber trees planted in CHTDB villages. If this income from rubber trees was excluded, all participants would have similar low level income from trees. This indicates a need to take measures so that PF participants' Tree Income level increases.

In the case of Fruit Income, the five income levels were lower Tk 0-15,000, lower middle Tk 15,001-30,000, middle Tk 30,001-45,000, higher middle Tk 45,001-60,000 and higher Tk 60,001-75,000. As can

be seen from Table 5.3.14, FD Fruit Income occupies the lower, lower middle, middle and higher levels, yet with 83.9 percent of income falling in the lower level. CHTDB and NGO participants' Fruit Incomes occupy the lower, lower middle, middle, higher middle levels, with 66.7 percent and 53.3 percent of income falling in the lower level respectively. This indicates that most FD, CHTDB and NGO participants' Fruit Income is low, and thus a need to take measures so that participants' Fruit Income levels increase. Additionally, it indicates the comparatively higher income derived from fruit trees than from trees that do not bear fruit.

Table 5.3.14: Organization-wise Numbers of Participants from each of the Five Divided Income Levels for (a) Tree; (b) Fruit; (c) Bamboo Separately

(a) Tree Income Level (in Taka)						
Organization	0-8000 ¹	8001-16000 ²	16001-24000 ³	24001-32000 ⁴	32001-40000 ⁵	Total
FD	26 (83.90)	5 (16.10)	0 (0.00)	0 (0.00)	0 (0.00)	31 (100)
CHTDB	0 (0.00)	0 (0.00)	0 (0.00)	7 (58.30)	5 (41.70)	12 (100)
NGO	12 (80.00)	3 (20.00)	0 (0.00)	0 (0.00)	0 (0.00)	15 (100)
Total	38 (65.52)	8 (13.79)	0 (0.00)	7 (12.07)	5 (8.62)	58 (100)
(b) Fruit Income Level (in Taka)						
Organization	0-15000 ¹	15001-30000 ²	30001-45000 ³	45001-60000 ⁴	60001-75000 ⁵	Total
FD	26 (83.90)	2 (6.50)	1 (3.20)	0 (0.00)	2 (6.50)	31 (100)
CHTDB	8 (66.70)	1 (8.30)	2 (16.70)	1 (8.30)	0 (0.00)	12 (100)
NGO	8 (53.30)	5 (33.30)	1 (6.70)	1 (6.70)	0 (0.00)	15 (100)
Total	42 (72.41)	8 (13.79)	4 (6.90)	2 (3.45)	2 (3.45)	58 (100)
(c) Bamboo Income Level (in Taka)						
Organization	0-5000 ¹	5001-10000 ²	10001-15000 ³	15001-20000 ⁴	20001-25000 ⁵	Total
FD	29 (93.50)	2 (6.50)	0 (0.00)	0 (0.00)	0 (0.00)	31 (100)
CHTDB	12 (100)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	12 (100)
NGO	14 (93.30)	0 (0.00)	0 (0.00)	0 (0.00)	1 (6.70)	15 (100)
Total	55 (94.83)	2 (3.448)	0 (0.00)	0 (0.00)	1 (1.72)	58 (100)

FD=Forest Department, CHTDB= Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

1, 2, 3, 4, 5 indicate lower, lower middle, middle, higher middle, higher levels respectively.

The majority of income from bamboo was earned by FD participants, particularly in the Alotila village, as mentioned earlier. Bamboo Income was also found to fall in the lower levels, as seen in the Table 5.3.14. Overall, it was found that the income from the forestry segment of farming practices was mainly derived from fruits, followed by trees, and that there exists scope for higher levels of income generation from these two components as well as for the introduction of bamboo cultivation in all villages for short-term forestry income generation. The higher levels of income generated from fruits and trees by a few participants confirmed the possibility of higher level earnings if appropriate measures are taken.

Relationships between Forest Income Components

Taking into account all the study villages as a whole, the following results are obtained: Tree Income (Mean 9,091.91; SD 12,498.898; N 58), Fruit Income (Mean 14,507.41; SD 14,931.357; N 58), Bamboo Income (Mean 775.00; SD 3,513.910; N 58) and Total Forest Income (Mean 24,374.33; SD 20,298.226; N 58). Upon correlation, these figures demonstrate a substantial relationship between Total Forest Income and Tree Income ($P \leq 0.001$), a very strong relationship between Total Forest Income and Fruit Income ($P \leq 0.001$) and a low correlation between Total Forest Income and Bamboo Income ($P \leq 0.05$) (see Table 5.3.15). This indicates that though all the three components of forest income contributed significantly to Total Forest Income, the major contribution was from fruit and then trees.

Regression analysis between dependent variable Total Forest Income and independent variables Tree Income, Fruit Income and Bamboo Income showed directly proportional significant ($P \leq 0.001$, $P \leq 0.001$ and $P \leq 0.05$) relationships respectively (see Table 5.3.16 and Figure 5.3.3). Accordingly, it can be inferred that, as indicated by regression equations and models, participants' annual forest income was the individual significant contribution of all the three components of forest income was in the order Fruit > Tree > Bamboo. This shows the major contributions to Forest Income were from trees and fruit, with all participants in all interventions planting forest trees and fruit trees to generate forestry income.

Table 5.3.15: Correlation between Forestry Income and its Components (in Taka)

Variables	Correlation Coefficient			
	Tree Income	Fruit Income	Bamboo Income	Total Forestry Income
Tree Income	-	0.027 ^{LC} (0.842)	-0.138 ^{LC} (0.300)	0.612 ^{SC} (0.000)
Fruit Income	0.027 ^{LC} (0.842)	-	0.216 ^{LC} (0.104)	0.789 ^{VSC} (0.000)
Bamboo Income	-0.138 ^{LC} (0.300)	0.216 ^{LC} (0.104)	-	0.247 ^{LC} (0.042)
Total Forestry Income	0.612 ^{SC} (0.000)	0.789 ^{VSC} (0.000)	0.247 ^{LC} (0.042)	-

^{NC} = Negligible Correlation, ^{LC} = Low Correlation, ^{SC} = Substantial Correlation, ^{VSC} = Very Strong Correlation. Values in parenthesis show P-value.

Once again, bamboo, though a short-term income generating forest produce, was not found to be grown at such a level as to contribute substantially to forest income, perhaps because of a lack of awareness and knowledge. Participants of only two villages, NGO village Dulochari and FD village Alotila, earned Bamboo Income, with average annual income from small-scale bamboo plantations of Tk 500 and Tk 2850, respectively. This implies that an appropriate mechanism for disseminating knowledge about higher income-generating minor forest produce species should be developed and put into practice. It may be noted that the relationship between Tree Income and Fruit Income was low and that with Bamboo Income was negatively low, indicating that with the increase of Tree Income, Fruit Income would increase slowly, but Bamboo Income would decrease at a slow rate. This implies that in the context of these farming practices, increasing Tree Income would necessitate more land to plant a greater number of trees that would subsequently decrease the availability of land for other avenues of cultivation.

Table 5.3.16: Relationships between Forestry Income and its Components

Dependent Variable (Y)	Independent Variables (X)	Regression Model	R	F	P-Value
Forestry Income	Tree Income	$Y = 15344.897 + 0.993X$	0.612	33.453	0.000***
Forestry Income	Fruit Income	$Y = 8804.144 + 1.073X$	0.789	92.655	0.000***
Forestry Income	Bamboo Income	$Y = 23270.196 + 1.425X$	0.247	3.627	0.042*

* = iSgnificant at 0.05 level, *** = Significant at 0.001 level.

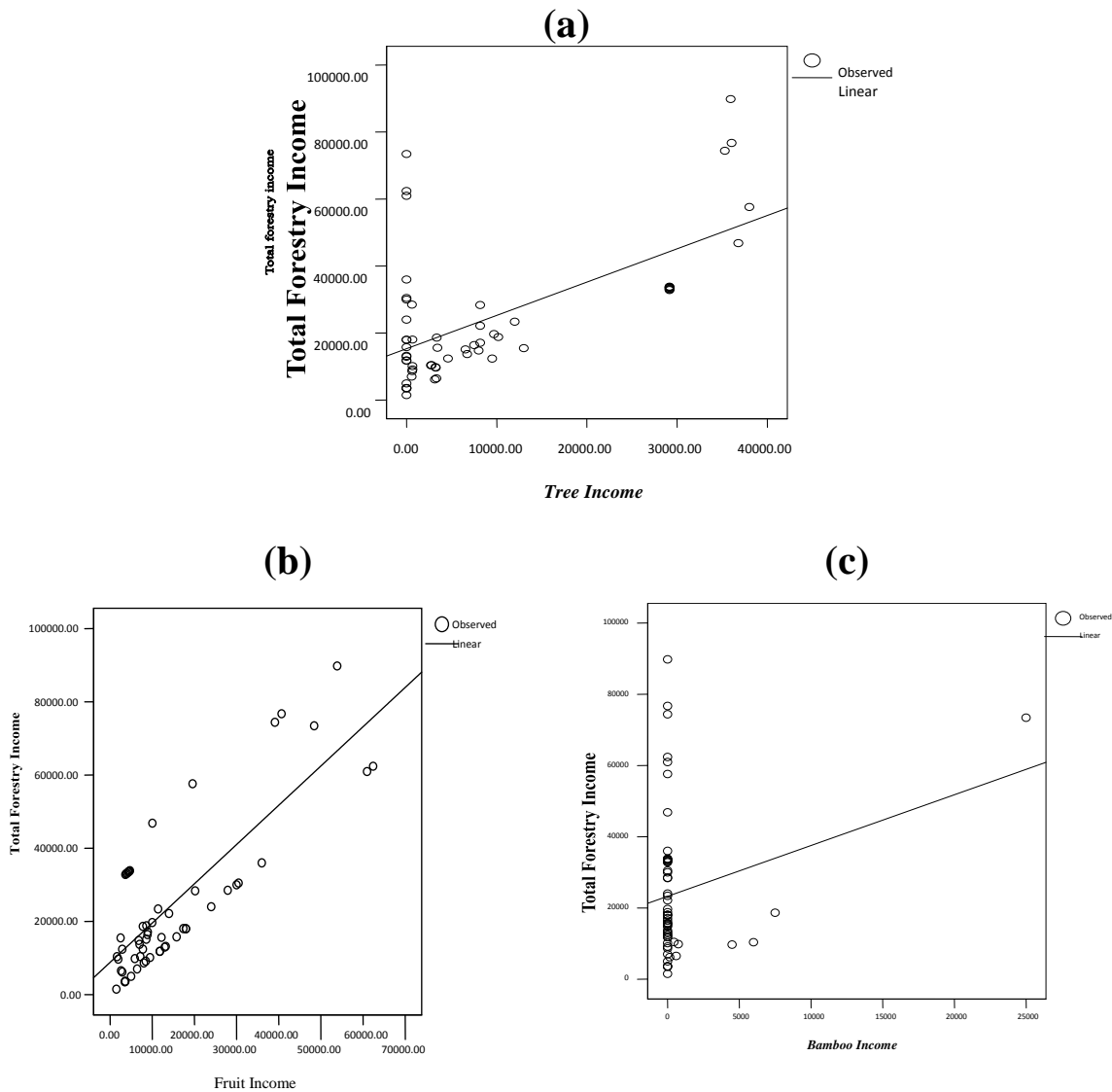


Figure 5.3.3: Regression Models between Forestry Income and its Components: (a) Tree Income; (b) Fruit Income; (c) Bamboo Income

Participants' Comments Regarding Economic Upliftment

In order to gauge the participants' views about their economic upliftment via PF practices, all the participants in all GO and NGO villages were interviewed individually. All participants firmly expressed that their economic condition had improved. To understand the extent of improvement, participants were asked to categorise their income as 1) Well Improved, 2) Moderately Improved, or 3) Less Improved, so that they could easily express their views in context of their overall economic situation. It was found that 37.9%, 43.1% and 19.0% of participants fell under category 1, 2 and 3 respectively. It may be opined that individual economic upliftment of participating farmers is reflected in a collective way in Table 5.3.17.

Table 5.3.17: Organization-wise Participant Comments Regarding Economic Upliftment

Organization	Participants Comments on Economic Upliftment			Total
	Well Improved	Moderately Improved	Little Improved	
FD	16 (51.6)	11 (35.5)	4 (12.9)	31 (100)
CHTDB	4 (33.3)	6 (50)	2 (16.7)	12 (100)
NGO	2 (13.3)	8 (53.3)	5 (33.3)	15 (100)
Total	22 (37.93)	25 (43.10)	11 (18.97)	58 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Discussions about Income Generation

All the GO and NGO participants were actively involved in farming practices through participation with their respective agencies, generating significant income. As compared to the income before PF interventions, the Total Income (farm income and off-farm income) was found to be highly significant ($P \leq 0.001$). Farm Income contributed in high significance to the Total Income. Participant income increased manifold. Comparing the average annual income of beneficiary types revealed the pattern of income: FD < CHTDB < NGO. However, taking into account the income before project interventions revealed the increasing pattern was NGO < FD < CHTDB. This may be due to the fact that poor GO farmers made more endeavour towards farming practices than the comparatively rich NGO farmers.

Not only does significant variation in income exist among the types of beneficiaries, but their income levels also vary. The majority of FD and CHTDB participants occupied the lowest and lower middle income levels, and those in NGO projects a level higher. FD participants did not occupy the high level, but 8.3 percent and 20.0 percent of CHTDB and NGO participants respectively occupied the high level, indicating that it is possible to earn a high income via employing proper farming practices and greater endeavour. This infers the need for PF intervening agencies to take appropriate measures to fully involve participants in their projects. Further study is required to expose the retarding factors that lead the majority of farmers to work in such a low intensity that they earned low level incomes and to discover the means to lead them to earn high level incomes. To increase income, all

income components should be given priority accordingly, so that increased aggregate production of all farming components leads to a rise in total farm income.

The similar Forest Income of FD and NGO participants varied significantly to that of CHTDB participants. The similar Agricultural Income of FD and CHTDB participants varied significantly to that of NGO participants. No significant variation was found in Livestock Income. There exists the need to unearth the factors that caused variation in participant incomes, though in the case of Forest Income it is known that the rubber species generated more income through the latex extracted, indicating the importance of species selection for higher income generation. Again, generally, all the components of farm income were found to be significant in relation to total income. However, the income levels of the farm components showed that there is the potential to increase the incomes of most participants who fell into the lower income levels. Measures should be taken accordingly, by providing training, inputs, incentives, etc., as well as proper guidance and supervision, to PF participants.

Forestry practices may be regarded as a non-negotiable determinant in PF land use. Therefore, the income from forestry was studied in-depth with its components. It was found that all the three components of Forestry Income (tree, fruit and bamboo) made significant contributions to participants' total forest income. Tree and fruit income were found to be significant at the $P \leq 0.001$ level and bamboo income at the $P \leq 0.05$ level. Again, among the beneficiary types, significant variation was found in tree income, but not in fruit or bamboo income. This variation was due to the planting of rubber species by CHTDB, indicating the importance of species selection in farm income generation.

It is mentionable here that findings and observations in and around the PF systems showed that there was a general tendency to plant short-term and higher income generating species. Both GO and NGO PF agencies allowed the participants to plant species as desired by the participants. However, for erosion control and overall environmental improvement in such hilly areas, it is desirable to plant species based on ecological considerations. Ecological consideration in plant selection was found to be almost absent in all the study villages. Participants of NGO Jabarang even planted banana in hill slopes with the intention to earn more money in a short span of time. However, banana crops are not suitable for high hill cultivation due to the damaging effect they have on the soil. Other NGO and GO

participants mainly selected Teak and Gamar species to earn more income. In this way, ecological and watershed management implications were not considered. In PF, peoples' choice should be given preference and in this hilly area, PF participants are poor and need quick income to support their livelihoods, and it is permissible to sacrifice environmental improvement in lieu of the comparatively rapid economic upliftment of participants. Project implementing agencies need to consider whether it is wise to continue in this manner. If not, the issue should be addressed properly in future PF practices in CHT. This requires extensive multidisciplinary studies comprising the overall context of socio-economic and environmental ecological aspects of CHT and the creation of informative policy guidelines.

However, GO and NGO PF practices in CHT did lead to substantial economic upliftment of participants. Their upliftment was highly visible in the increased expenditure they incurred for farming as well as socio-cultural events. When speaking about their feelings in regards to their post-PF project economic conditions as compared to their previous situation, all participants commented that they gained countable economic status from PF practices, categorising the change as well, moderate and less improved at a rate of 37.9%, 43.1% and 19.0% respectively. This was an indication that participants also felt that if they made greater endeavour, their economic and related gains would increase more, denoting consistency with the related findings above.

Expenditure Patterns

Expenditure patterns of the participants

Participants of all the 9 GO and NGO PF villages were asked how they spent their income during one-on-one interviews and their answers were cross-checked through group discussions, key informant interviews and observations of individual farms and their surroundings. It was found that the expenses of all participants were predominantly threefold. These were 1) Farm Expenditure that includes the expense incurred for forestry, agro-forestry, agricultural practices and livestock rearing; 2) household consumption of rice, vegetables fruit, etc., for their livelihood, named Food Expenditure here; and 3) the expenses participants generally incurred for education of their children, clothes, medicine, entertainment for their guests and family gatherings, including the religious occasions and festivals, which were grouped here as Social Expenditure. The average annual expenditures of the 9 villages studied are shown in Table 5.4.1. The table shows that variation exists in the three categories of expenditure, but the common

element was that all the participants incurred the above-mentioned expenses with a view to increase their farm income as well as to support a better livelihood.

Table 5.4.1: Average Annual Expenditure (in Taka) of the 9 Study Villages in the Chittagong Hill Tracts

Village	Organization	Farm Expenditure	Food Expenditure	Social Expenditure	Total
Longodu	FD	12278 (32.88)	17193 (46.05)	7867 (21.07)	37338 (100)
Dulochari	NGO	23764 (26.42)	48833 (54.30)	17340 (19.28)	89937 (100)
Kibukpara	CHTDB	5531 (12.30)	22963 (51.07)	16471 (36.63)	44965 (100)
Alotila	FD	10428 (32.91)	17051 (53.81)	4210 (13.29)	31689 (100)
Gasbow	CHTDB	19728 (24.07)	30995 (37.82)	31240 (38.11)	81963 (100)
Babupara	FD	13584 (23.21)	24195 (41.35)	20740 (35.44)	58519 (100)
Kemalongpara	NGO	14509 (26.46)	24862 (45.34)	15460 (28.20)	54831 (100)
Mathaipara	NGO	17069 (24.79)	25285 (36.72)	26500 (38.49)	68854 (100)
Banifulpara	FD	7443 (21.32)	24610 (70.51)	2850 (8.17)	34903 (100)
	Total	124334 (24.72)	235987 (46.92)	142678 (28.37)	502999 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Organization-wise Variations in Expenditure

For all three intervening agencies (FD, CHTDB and NGO), variations were found in participants' total family expenditure as well as its components (Farm Expenditure, Food Expenditure and Social Expenditure), as shown in Table 5.4.2. Assessment of the variation showed that, in the case of Total Expenditure, the beneficiaries of NGO projects on an average were incurring higher expenditure than those of FD and CHTDB projects. The expenditure pattern revealed that the mean annual expenditures of NGO beneficiaries (Tk 71,207.79) and CHTDB beneficiaries (Tk 60,381.08) were significantly ($P \leq 0.001$) higher than the beneficiaries of FD (Mean Tk 42,299.03). Between NGO and CHTDB no significant difference was observed. It is simple to infer that, as the participants in NGO and CHTDB projects earned significantly higher incomes than participants in FD projects, their expenses were significantly higher than FD participants accordingly.

Visible variations in all three (farming, food and social) components of expenditure were also present. Expenditure patterns showed that the Farm Expenditure of beneficiaries under FD (Mean Tk 11,033.84) and CHTDB (Mean Tk.11,446.17) projects was significantly lower ($P \leq 0.001$) than for NGO beneficiaries (Mean Tk 18,447.53). This may be due to the existence of comparatively rich participants in NGO villages compared to FD and CHTDB villages, associated with the effect of the land tenure status in the PF villages studied. Food Expenditure of beneficiaries of FD (Mean Tk 21,333.90) and CHTDB (Mean Tk 26,309.92) projects was also significantly lower ($P \leq 0.001$) than NGO beneficiaries (Mean Tk 32,993.53). Falling in the middle range, CHTDB participants' Food Expenditure exhibited partially significant variation with other participants. This partially significant variation in food expenditure by beneficiaries of CHTDB was due to a significant higher expenditure compared to FD as well as non-significant lower mean expenditure as compared to NGO. These expenditure figures show clear patterns of variation as well as similarity among beneficiary types.

In the case of Social Expenditure, the data displayed that beneficiaries of FD (Mean Tk 9931.29) projects incurred expenses that were significantly lower ($P \leq 0.001$) than those of CHTDB (Mean Tk 22,625.00) and NGO (Mean Tk 19,766.67) beneficiaries. This indicates a similar relationship to that of the assessment of Total Expenditure; the participants of NGO and CHTDB earned significantly higher incomes than FD participants, thus their expenditure was significantly higher than those of FD participants accordingly

Table 5.4.2: Variations in the Components of Average Annual Expenditure of the Participants between Organizations

Organization	Farm Expenditure	Food Expenditure	Social Expenditure	Total Expenditure
FD	11033.84 ^b	21333.90 ^b	9931.29 ^b	42299.03 ^b
CHTDB	11446.17 ^b	26309.92 ^{ab}	22625.00 ^a	60381.08 ^a
NGO	18447.53 ^a	32993.53 ^a	19766.67 ^a	71207.79 ^a
F-ratio	5.536 ^{***}	7.439 ^{***}	5.480 ^{***}	9.574 ^{***}

FD=Forest Department, CHTDB= Chittagong Hill Tracts Development Board,

NGO = Non -Government Organization. *** = Significant at 0.001 level.

Superscript with the same letter represented denotes no significant difference.

Expenditure Component Levels

Farm Expenditure Levels

Average annual expenditure in taka incurred in the study villages for farming practices was grouped into five levels, as in Table 5.4.3. The lowest and lower middle levels were occupied by FD participants at 25.8 and 61.3 percent, indicating most FD participants had low level farm spending. In the case of CHTDB villages, about 66 percent of participants occupied the lowest and lower middle levels in equal proportions. These figures indicate that, like FD participants, the majority fall under the lowest and lower middle levels, but that some participants had higher farm spending. NGO villages covered four farm expenditure levels, with majority in the lower middle (33.3%) and middle (40%) levels. This indicates that NGO participants spent comparatively more money towards farming practices than those of GO participants. From Table 5.4.3 it is evident that in both GO and NGO cases, higher level expenditure incurrence did occur. This is an indication that necessary steps may be taken to increase farming expenses in order to thus generate more income from farming practices.

Food Expenditure Levels

Average annual Food Expenditure in the study villages was grouped into five levels, as shown in Table 5.4.3. FD participants occupy the lowest and lower middle levels at 6.5 and 93.5 percent with no one reaching the middle or higher levels. Thus, in FD villages all participants spent low levels on food consumption. In the case of CHTDB villages, 8.3, 75 and 16.7 percent of participants occupy the lowest, lower middle and middle levels. These figures indicate that majority of CHTDB participants fall under the lower middle level of Food Expenditure, with no one in the higher middle or higher levels. In NGO villages, the majority of participants (80%) fall under the lower middle level and the rest occupy the middle and higher middle levels. This indicates that NGO participants expended comparatively more money on food than GO participants, but in all cases most participants fall under the lower middle level of Food Expenditure. From Table 5.4.3 it was evident that higher level consumption happened only in NGO case, indicating that they are comparatively rich on an average. Table 5.4.3 shows that a higher level expenditure for food was only incurred by NGO participants, perhaps as they are comparatively richer

on average and can therefore afford to purchase more food from the market rather than eating the crops they produce. This is an indication that assistance should be given to poor farmers so that they can increase the productivity of their farms. This would allow them to consume more of their crops for better nutritional intake and healthy living.

Social Expenditure Levels

Average annual expenditure incurred for social expenses in study villages were grouped into five levels, as shown in Table 5.4.3. The lowest and lower middle levels were occupied at 80.6 and 12.9 percent by FD participants, with one in each of the middle and highest levels. In case of CHTDB villages, 16.7 and 66.7 of participants occupy the lowest and lower middle levels, with the rest in the middle and higher middle levels. The majority of NGO villages fall in the lowest (33.3%) lower middle (46.7%) levels and the rest in the middle and higher middle levels. These figures indicate that the majority of all participants incurred lower level social expenses, with CHTDB and NGO participants slightly better off with most participants spending in the lower middle level, compared to the low level for FD participants. From Table 5.4.3 it can be seen that higher level expenditure did occur in both GO and NGO cases, suggesting that higher level expenditure is possible by rich and more socially active farmers. This is an indication that income generation, as well as social awareness building activities and opportunities, should be furthered for all PF participants.

Table 5.4.3: Organization-wise Number of Participants from each of the Five Divided Expenditure Levels for (a) Farm; (b) Food; (c) Social Separately

(a) Farm Expenditure Level (in Taka)						
<i>Organization</i>	0-7000	7001-14000	14001-21000	21001-28000	28001-35000	Total
FD	8 (25.80)	19 (61.30)	2 (6.50)	0 (0.00)	2 (6.50)	31 (100)
CHTDB	4 (33.30)	4 (33.30)	3 (25.00)	0 (0.00)	1 (8.30)	12 (100)
NGO	0 (0.00)	5 (33.30)	6 (40.00)	2 (13.30)	2 (13.30)	15 (100)
Total	12 (20.69)	28 (48.28)	11 (18.97)	2 (3.45)	5 (8.62)	58 (100)

(b) Food Expenditure Level (in Taka)						
<i>Organization</i>	0-16000	16001-32000	32001-48000	48001-64000	64001-80000	Total
FD	2 (6.50)	29 (93.5)	0 (0.00)	0 (0.00)	0(0.00)	31 (100)
CHTDB	1 (8.30)	9 (75.0)	2 (16.70)	0 (0.00)	0(0.00)	12 (100)
NGO	0 (0.00)	12 (80.0)	1 (6.70)	0 (0.00)	2 (13.3)	15 (100)
Total	3 (5.17)	50(86.21)	3 (5.17)	0 (0.00)	2(3.45)	58 (100)
(c) Social Expenditure Level (in Taka)						
<i>Organization</i>	0-15000	15001-30000	30001-45000	45001-60000	60001-75000	Total
FD	25 (80.60)	4 (12.90)	1 (3.20)	0 (0.00)	1 (3.20)	31 (100)
CHTDB	2 (16.70)	8 (66.70)	1 (8.30)	1(8.30)	0 (0.00)	12 (100)
NGO	5 (33.30)	7 (46.70)	2 (13.30)	1(6.70)	0 (0.00)	15 (100)
Total	32 (55.17)	19 (32.76)	4 (6.90)	2(3.45)	1 (1.72)	58 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Relationships among the Income and Expenditure Components

In all the PF interventions studied, participants incurred similar componential expenses with variation in magnitude among them. Therefore, the existence of any correlation between the Total Income and Total Expenditure with the individual expenditure components was assessed through correlation analysis as shown in Table 5.4.4.

Table 5.4.4: Correlation between the Total Expenditure, Total Farm Income and Total Income with the Expenditure Components of Participants

Variable	Correlation Coefficient			
	Farm Expenditure	Food Expenditure	Social Expenditure	Total Expenditure
Farm Expenditure	-	0.357 ^{MC} (0.445)	0.567 ^{SC} (0.000)	0.785 ^{VSC} (0.000)
Food Expenditure	0.357 ^{MC} (0.006)	-	0.227 ^{LC} (0.086)	0.668 ^{SC} (0.000)
Social Expenditure	0.567 ^{SC} (0.000)	0.227 ^{LC} (0.086)	-	0.834 ^{VSC} (0.000)
Total Expenditure	0.785 ^{VSC} (0.000)	0.688 ^{SC} (0.000)	0.834 ^{VSC} (0.000)	-

Variable	Correlation Coefficient			
	Farm Expenditure	Food Expenditure	Social Expenditure	Total Farm Income
Farm Expenditure	-	0.357 ^{MC} (0.006)	0.567 ^{SC} (0.000)	0.821 ^{VSC} (0.000)
Food Expenditure	0.357 ^{MC} (0.006)	-	0.227 ^{LC} (0.086)	0.415 ^{SC} (0.001)
Social Expenditure	0.567 ^{SC} (0.000)	0.227 ^{LC} (0.086)	-	0.557 ^{VSC} (0.000)
Total Farm Income	0.821 ^{VSC} (0.000)	0.415 ^{SC} (0.001)	0.557 ^{VSC} (0.000)	-

Variable	Correlation Coefficient			
	Farm Expenditure	Food Expenditure	Social Expenditure	Total Income
Farm Expenditure	-	0.357 ^{MC} (0.006)	0.567 ^{SC} (0.000)	0.685 ^{VSC} (0.000)
Food Expenditure	0.357 ^{MC} (0.006)	-	0.227 ^{LC} (0.086)	0.750 ^{SC} (0.000)
Social Expenditure	0.567 ^{SC} (0.000)	0.227 ^{LC} (0.086)	-	0.528 ^{VSC} (0.000)
Total Income	0.685 ^{VSC} (0.000)	0.750 ^{SC} (0.000)	0.528 ^{VSC} (0.000)	-

LC = Low correlation, MC = Moderate correlation, SC = Substantial correlation, VSC = Very strong correlation. Values in parenthesis show P-value.

Taking into account all the study villages as a whole, correlation between the following variables was performed: Total Expenditure (Mean 53,516.53; SD 24,947.566; N 58), Total Farm Income (Mean 55,713.03; SD 30,031.418; N 58), Total Income (Mean 76,535.45; SD 48,330.376; N 58), Farm Expenditure (Mean 13,036.48; SD 7,884.775; N 58), Food Expenditure (Mean 25,378.84; SD 10,691.964; N 58), and Social Expenditure (Mean 15,101.21; SD 13,917.202; N 58).

The results using correlation coefficient Total Expenditure showed a very strong relationship with Farm Expenditure, a substantial relationship with Food Expenditure, and a very strong relationship with Social Expenditure of the participants, as shown in Table 5.4.4 and Fig 5.4.1(iii). These outcomes indicate that the Total Expenditure of the participants significantly correlated, albeit in more or less intensity, to all its three components.

The results using correlation coefficient Total Farm Income demonstrated a very strong relationship with Farm Expenditure, a substantial relationship with Food Expenditure and a very strong relationship with Social Expenditure of the participants, as shown in Table 5.4.4 and Fig 5.4.1(i). This indicates the Farm Income of the participants was the ultimate contributor to the componential expenses, as explained above.

The results using correlation coefficient Total Income showed a very strong relationship with Farm Expenditure, a substantial relationship with Food Expenditure and a very strong relationship with Social Expenditure of the participants, as shown in Table 5.4.4 & Fig 5.4.1 (ii). These results indicate that the farm as well as off-farm income of the participants contributed to the Total Expenditure. As a similar correlation was found between the Farm Income and the expenditure components, it may be opined that the Farm Income sufficiently contributed to the expenditures to make it highly significant, whilst the off-farm of the participants provided additional contributions.

Linear regression analysis between Farm Income and Farm Expenditure, Food Expenditure and Social Expenditure, taking Farm Income as the dependent variable, showed a highly significant ($P \leq 0.001$) and directly proportional increasing trend (see Table 5.4.5 and Figure 5.4.1(i)). Again, the same trend analysis between Total Income and the expenditure components also showed a highly significant ($P \leq 0.001$) and directly proportional increasing trend, as shown in Table 5.4.5 & Figure 5.4.1 (ii). Once again, the same trend analysis between Total Expenditure and the expenditure components also showed a highly significant ($P \leq 0.001$) and directly proportional increasing trend, as shown in Table 5.4.5 & Figure 5.4.1 (iii). It can be inferred that, as indicated by the regression equations and models, predominantly farm income, and additionally off-farm income, made a highly significant contribution to all the three expenditure components, making the aggregate total expenditure highly significant.

Table 5.4.5: Relationships between:

- i. Farm Income and (a) Farm Expenditure; (b) Food Expenditure; (c) Social Expenditure,
- ii. Total Income and (a) Farm Expenditure; (b) Food Expenditure; (c) Social Expenditure,
- iii. Total Expenditure and (a) Farm Expenditure; (b) Food Expenditure; (c) Social Expenditure

Dependent Variables (Y)	Independent Variables (X)	Regression Equation	R	F	P-Value
Farm Income	Farm Expenditure	$Y=14954.917 + 3.126X$	0.821	115.677	0.000***
Farm Income	Food Expenditure	$Y= 26115.655 + 1.166X$	0.415	11.665	0.000***
Farm Income	Social Expenditure	$Y=37563.453 + 1.202X$	0.557	25.185	0.000***
Total Income	Farm	$Y=21766.618 +$	0.685	49.614	0.000***

Dependent Variables (Y)	Independent Variables (X)	Regression Equation	R	F	P-Value
	Expenditure	4.201X			
Total Income	Food Expenditure	$Y = -9453.416 + 3.388X$	0.750	71.808	0.000***
Total Income	Social Expenditure	$Y = 48843.096 + 1.834X$	0.528	21.653	0.000***
Total Income	Total Expenditure	$Y = -9769.794 + 1.613X$	0.832	126.393	0.000***
Total Expenditure	Farm Expenditure	$Y = 21123.992 + 2.485X$	0.785	90.109	0.000***
Total Expenditure	Food Expenditure	$Y = 13947.809 + 1.559X$	0.668	45.174	0.000***
Total Expenditure	Social Expenditure	$Y = 30932.122 + 1.446X$	0.834	128.242	0.000***

** = Significant at 0.001 level

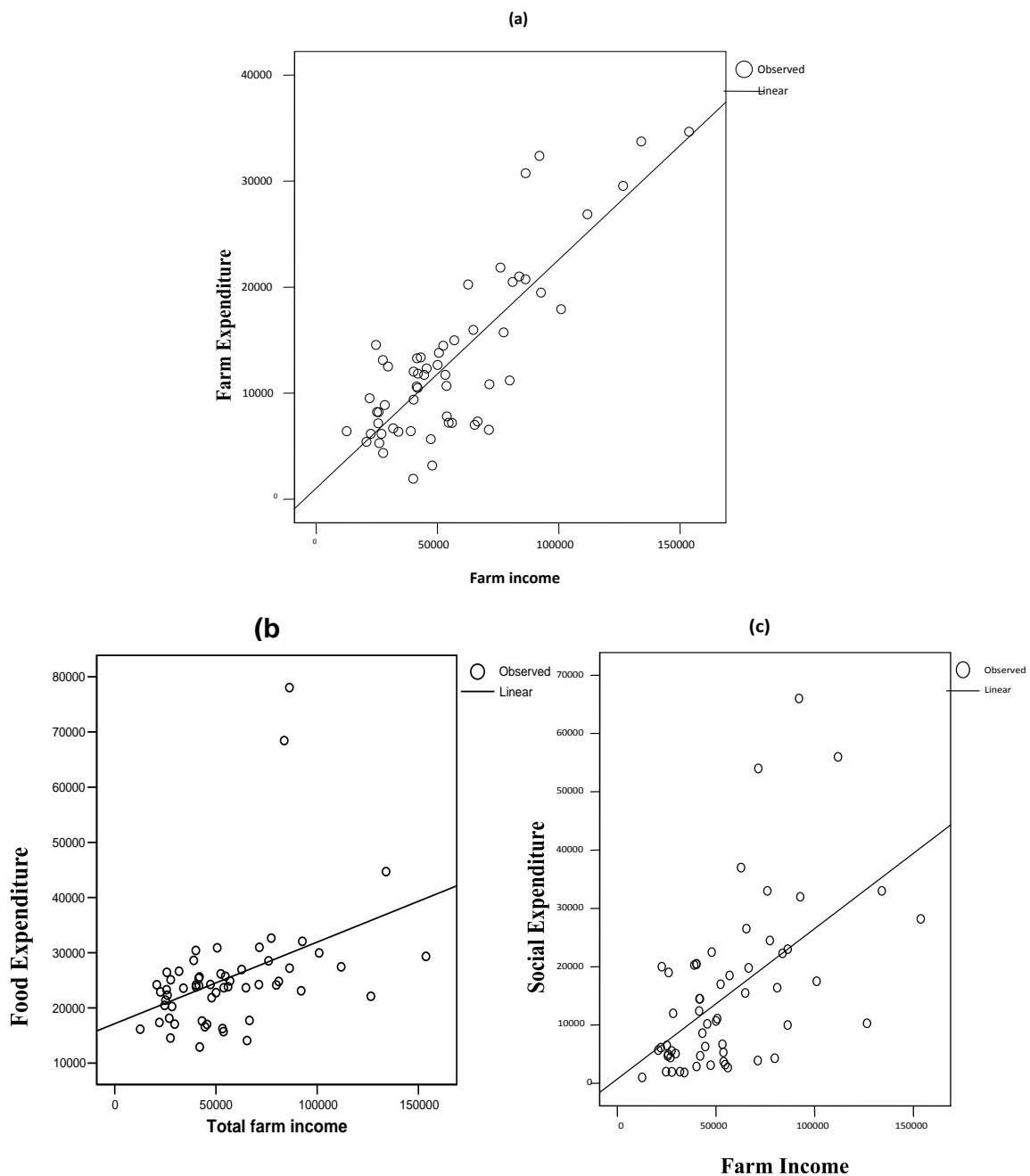


Figure 5.4.1(i): Regression Models between Farm Income and (a) Farm Expenditure; (b) Food Expenditure; (c) Social Expenditure

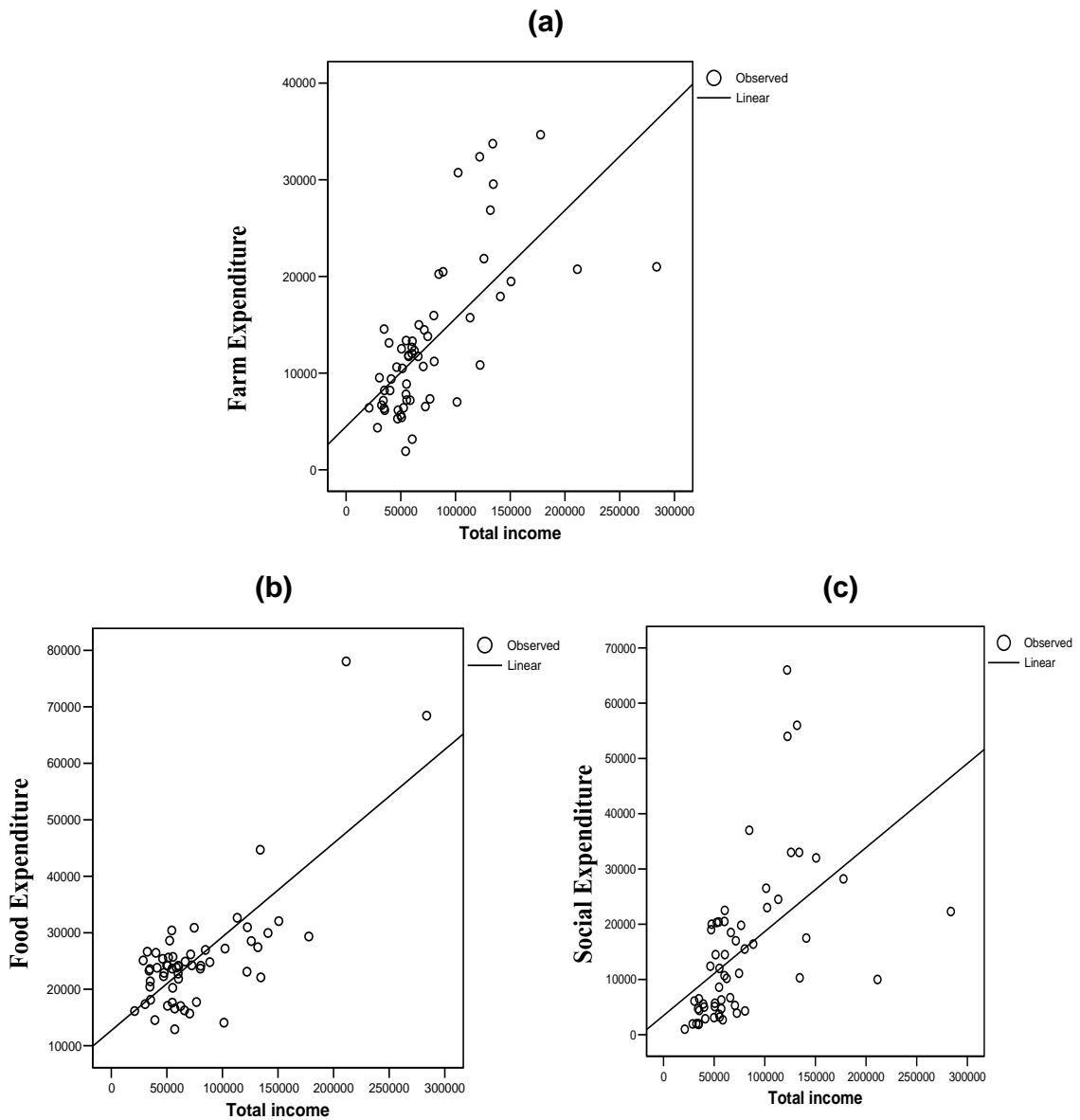
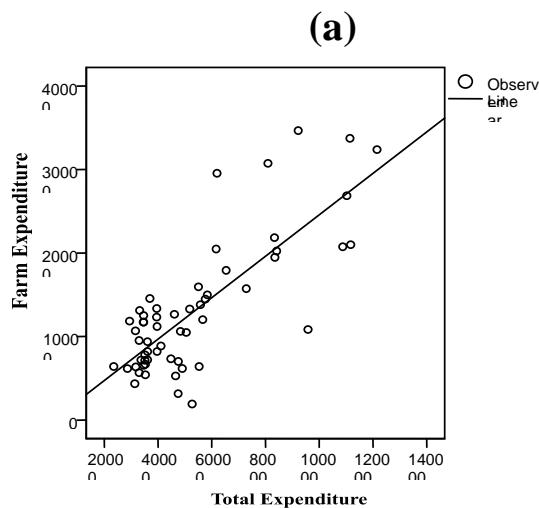


Figure 5.4.1 (ii): Regression Models between Total Income and (a) Farm Expenditure; (b) Food Expenditure; (c) Social Expenditure



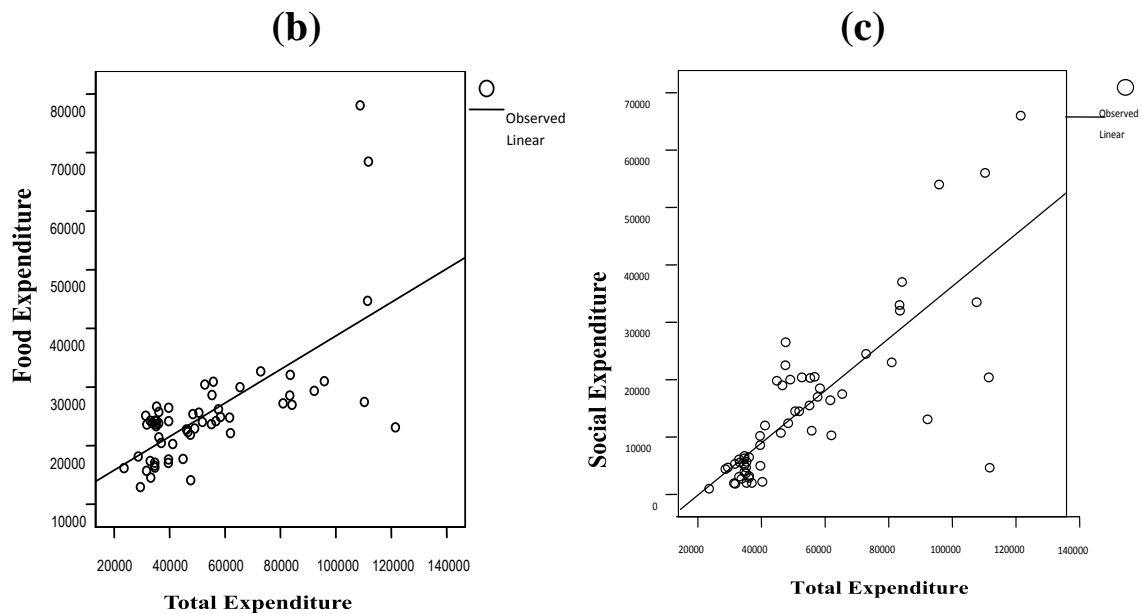


Figure 5.4.1 (iii): Regression Models between Total Expenditure and (a) Farm Expenditure; (b) Food Expenditure; (c) Social Expenditure

Farm Expenditure Components

As mentioned earlier, the Total Farm Expenditure incorporates expenditure for forestry, agriculture, and livestock practices. The average farm expenditure in each of the 9 villages study was calculated, as shown in Table 5.4.6. From this data, it is apparent that participants in all the villages practiced forestry. This commonly included forest trees and fruit trees, with the exception of Alotila FD village, where participants additionally incurred expenditure for bamboo (see Table 5.4.11). It is mentionable here that in other villages, bamboo was observed to be growing sporadically in negligible amounts without expenditure incurred. In Alotila village, farmers spent Tk 620 towards bamboo farming for which they received income Tk 2850, as shown in Forestry Expenditure Table 5.4.11 & Forestry Income Table 5.3.12. In the same income Table 5.3.12, average income from bamboo for Dulochari NGO village is Tk 5000 per year, but they did not make any investment in bamboo. This indicates that most of the farmers were not aware about the importance of bamboo and other minor forest produce as an income-generating source. Regarding other components, it was found that some investments were made towards fruit trees, but for forest trees investment was comparatively very low. This suggests the farmers' inherent wish to obtain income in a short span of time. Average annual expenditures incurred towards agriculture and livestock rearing in these villages, as in Table 5.4.11, also confirm the same conclusion.

Table 5.4.6: Average Farm Expenditure in 9 Villages of the CHT (in Taka)

Village	Organization	Forestry Expenditure	Agriculture Expenditure	Livestock Expenditure	Total Farm Expenditure
Longodu	FD	3509.67 (28.58)	3608.33 (29.39)	5160.33 (42.03)	12278.33 (100)
Alotila	FD	2856.57 (27.39)	6515.43 (62.48)	1055.71 (10.12)	10427.71 (100)
Babupara	FD	8099.60 (59.63)	4284.60 (31.54)	1200.00 (8.83)	13584.20 (100)
Banifulpara	FD	3652.86 (49.08)	2119.88 (28.48)	1670.14 (22.44)	7442.88 (100)
Kibukpara	CHTDB	1650.01 (29.83)	1055.14 (19.08)	2825.71 (51.09)	5530.86 (100)
Gasbow	CHTDB	12881.60 (65.30)	4074.00 (20.65)	2772.00 (14.05)	19727.60 (100)
Dulochari	NGO	6322.00 (26.60)	14370.00 (60.47)	3072.00 (12.93)	23764.00 (100)
Kemalongpara	NGO	4331.00 (29.85)	7958.60 (54.85)	2220.00 (15.30)	14509.60 (100)
Mathaipara	NGO	7864.00 (46.07)	4425.00 (25.92)	4780.00 (28.00)	17069.00 (100)
	Total	51167.31 (41.15)	48410.98 (38.94)	24755.89 (19.91)	124334.18 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Organization-wise Variation Among the Farm Expenditure Components

Among the three intervening organizations (FD, CHTDB and NGO), significant variation was found only in participants' Agriculture Expenditure, which ultimately resulted in variation in Total Farm Expenditure. The other two farming components, forestry and livestock rearing, were found in a state of non-significant variation (see Table 5.4.7). Assessment of the variation showed that, in case of Total Farm Expenditure, the beneficiaries of NGO projects had on average higher expenditure than participants of FD and CHTDB projects, as in Table 5.4.7. NGO beneficiaries had mean annual expenditure of Tk 18,447.53, which was significantly ($P \leq 0.01$) higher than beneficiaries of FD (Mean Tk.11,033.84) and CHTDB (Mean Tk 11,446.17).

Similarly, assessment of the variation in Agricultural Expenditure showed that the NGO participants incurred annual agriculture expenses (Mean Tk 8,917.87) that were significantly higher than those of FD (Mean Tk 4,098.81) and CHTDB (Mean Tk 2,313.00) participants. Differences observed between FD and CHTDB were not significant. These expenditure patterns indicate that the NGO participants were comparatively more interested in agriculture than forestry and livestock. It may be pointed out that the land tenure security of NGO participants allowed them to more openly show their inherent tendency of trying to earn short term income than GO participants.

Table 5.4.7: Variations in Components of Annual Farm Expenditure between Organizations (in Taka)

Organization	Farm Expenditure	Forest Expenditure	Agriculture Expenditure	Livestock Expenditure
FD	11033.84 ^b	4972.35 ^a	4098.81 ^b	2098.03 ^a
CHTDB	11446.17 ^b	6329.83 ^a	2313.00 ^b	2803.33 ^a
NGO	18447.53 ^a	6639.00 ^a	8917.87 ^a	3335.38 ^a
F-ratio	5.536 ^{**}	0.551 ^{NS}	14.898 ^{**}	1.175 ^{NS}

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non -Government Organization. ^{NS} = Not significant, ^{**} = Significant at 0.01 level.

Superscript with the same letter represented denotes no significant difference.

Farm Expenditure Component Levels

Forest Expenditure Levels

Annual expenditure incurred for forestry practices in the study villages was grouped into five levels as shown in Table 5.4.8. Eighty percent of FD participants incurred Forestry Expenditure that fell under lowest level, the remainder occupying lower middle (9.70%), middle (3.20%) and highest (6.50%) levels. This indicates that though there was forestry expenditure variation among participants in FD villages, most incurred expenditure for forestry at the lowest level (Tk 0-5,000). In the case of CHTDB villages, fifty percent of participants' forestry expenditure occupied the lowest level, 25 percent the lower middle and the remaining 25 percent occupied the middle, higher middle and highest levels in equal proportions. This indicates that though the participants in CHTDB villages occupied all expenditure levels, the

majority fell under the lowest and lower middle levels (Tk 0-5,000 and Tk 5,001-10,000). Forestry expenditure in NGO villages covered all levels except the highest level, with 46.70%, 33.3%, 13.3% and 6.7% in the lowest, lower middle, middle and higher middle levels respectively, indicating variability in expenditure which like CHTDB mostly fell under the lowest and lower middle levels. Overall, 65.5 percent of participants in the 9 study villages incurred expenditure for forestry that fell in the lowest level of Tk 0-5,000. This implies that though the participants performed forestry as a component of farming practices, most of them made fewer endeavours towards maintaining these perennial crops, with some exceptions of about 10 percent of participants. Thus, it is necessary to run more awareness campaigns to establish and maintain forestry crops as a means of income generation and environmental development. This should be buttressed via appropriate measures to increase the financial capability of participating farmers in incurring expenditure for forestry as a whole.

Agriculture Expenditure Levels

Similarly, expenditure for agriculture was grouped into five levels as shown in Table 5.4.8. 74.20, 22.60 and 3.20 percent of FD participants incurred expenditure that fell under the lowest, lower middle and middle levels respectively, with no participants occupying the higher middle or highest levels. This indicates that the FD participants mostly incurred expenditure for agricultural practices at the lowest two levels, being Tk 0-5,000 and Tk 5,001-10,000. In the case of CHTDB, 91.7 and 8.3 percent of participants fell under lowest and lower middle levels, with no participants occupying the higher three levels. Like in the FD case, CHTDB participants incurred expenditure in lowest two levels of Tk. 0-5,000 and Tk 5,001-10,000 for agricultural practices. In the NGO case, agriculture expenditures fell under the lowest, lower middle, middle and highest levels, with 20, 53.3, 20 and 6.7 percent of participants respectively. This indicates that participants of NGO villages incurred expenditure for agriculture mostly in lowest (Tk 0-5,000), lower middle (Tk 5,001-10,000) and middle (Tk 10,001-15,000) levels, with the majority of participants occupying the lower middle level. It can be thus concluded that comparatively greater agriculture expenditure was incurred by NGO participants than FD and CHTDB participants, with the majority of expenditure falling in the lowest level.

Table 5.4.8: Organization-wise Numbers of Participants from each of the Five Divided Farm Expenditure Levels for (a)Forestry; (b) Agriculture; (c) Livestock Separately

Organization	(a) Forestry Expenditure Level (in Taka)					Total
	0-5000 ¹	5001-10000 ²	10001-15000 ³	15001-20000 ⁴	20001-25000 ⁵	
FD	25 (80.60)	3 (9.70)	1 (3.20)	0 (0.00)	2 (6.50)	31 (100)
CHTDB	6 (50.00)	3 (25.00)	1 (8.30)	1 (8.30)	1 (8.30)	12 (100)
NGO	7 (46.70)	5 (33.30)	2 (13.30)	1 (6.70)	0 (0.00)	15 (100)
Total	38 (65.52)	11 (18.97)	4 (6.90)	2 (3.45)	3 (5.17)	58 (100)
Organization	(b) Agriculture Expenditure Level (in Taka)					Total
	0-5000 ¹	5001-10000 ²	10001-15000 ³	15001-20000 ⁴	20001-25000 ⁵	
FD	23 (74.20)	7 (22.60)	1 (3.20)	0 (0.00)	0 (0.00)	31 (100)
CHTDB	11 (91.70)	1 (8.30)	0 (0.00)	0 (0.00)	0 (0.00)	12 (100)
NGO	3 (20.00)	8 (53.30)	3 (20.00)	0 (0.00)	1 (6.70)	15 (100)
Total	37 (63.79)	16 (27.59)	4 (6.90)	0 (0.00)	1 (1.72)	58 (100)
Organization	(c) Livestock Expenditure Level (in Taka)					Total
	0-3000 ¹	3001-6000 ²	6001-9000 ³	9001-12000 ⁴	12001-15000 ⁵	
FD	23 (74.20)	8 (25.80)	0 (0.00)	0 (0.00)	0 (0.00)	31 (100)
CHTDB	7 (58.30)	3 (25.00)	2 (16.70)	0 (0.00)	0 (0.00)	12 (100)
NGO	11 (73.30)	3 (20.00)	0 (0.00)	0 (0.00)	1 (6.70)	15 (100)
Total	41 (70.69)	14 (24.14)	2 (3.45)	0 (0.00)	1 (1.72)	58 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

1, 2, 3, 4, 5 indicate lower, lower middle, middle, higher middle, higher levels respectively.

Livestock Expenditure Levels:

Expenditure incurred for livestock rearing by the participants of all study villages was similarly grouped into five levels as shown in Table 5.4.8. It was found that Livestock Expenditure of FD participants fell into the lowest and lower middle levels, at 74.2 and 25.8 percent respectively. In the CHTDB case, 58.3, 25 and 16.7 percent of participants occupied the lowest, lower middle and middle levels respectively, with no expenditure in the higher two levels. Thus, it is evident that FD and CHTDB participants incurred low level expenditure for livestock rearing. Not dissimilarly, NGO participants registered Livestock Expenditure of 73.3, 20 and 6.7 percent in the lowest, lower middle and highest levels respectively, indicating that irrespective of implementing organization, most participants incurred low level Livestock Expenditure. There was a minor exception of one

NGO participant incurring expenditure at the highest level, implying the possibility of higher level incurrence.

From the above findings, it is concluded that in all three components of farming practices, Forestry, Agriculture and Livestock, most participants incurred low levels of expenditure. It was also observed that, for all three components, some participants did incur expend higher amounts, indicating that higher expenditure levels were possible. This suggests that the majority of farmers did not make appropriate endeavours in their farming practices, necessitating that steps are taken to understand the reasons for such incurrence and devise possible remedial measures.

Relationships among Farm Expenditure Components

Taking into account all the study villages as a whole, correlation between the variables Total Farm Expenditure (Mean 13,036.48; SD 7,884.775; N 58), Forest Expenditure (Mean 5,684.24; SD 55,44.125; N 58), Agriculture Expenditure (Mean 4,975.64; SD 4,132.405; N 58), and Livestock Expenditure (Mean 2,552.65; SD 2,510.758; N 58) was performed. These calculations showed that there was a very strong relationship between Farm Expenditure and Forest Expenditure ($P \leq 0.001$), a substantial relationship between Farm Expenditure and Agriculture Expenditure ($P \leq 0.001$) and a moderate relationship between Farm Expenditure and Livestock Expenditure ($P \leq 0.01$) (see Table 5.4.9). This indicates that although participating farmers incurred expenditure for all three farming components, they placed more emphasis on Forestry, followed by Agriculture and Livestock. This is an indication that the indigenous people of CHT have an inclination towards forestry.

Table 5.4.9: Correlation between Participants' Farm Expenditure and its Components (in Taka)

Variable	Correlation Coefficient			
	Forestry Expenditure	Agricultural Expenditure	Livestock Expenditure	Farm Expenditure
Forest Expenditure	-	0.102 ^{LC} (0.445)	0.033 ^{LC} (0.805)	0.766 ^{VSC} (0.000)
Agricultural Expenditure	0.102 ^{LC} (0.445)	-	0.057 ^{NC} (0.672)	0.635 ^{SC} (0.000)
Livestock Expenditure	0.033 ^{NC} (0.805)	0.057 ^{NC} (0.672)	-	0.350 ^{MC} (0.07)
Farm Expenditure	0.766 ^{VSC} (0.00)	0.635 ^{SC} (0.00)	0.350 ^{MC} (0.07)	-

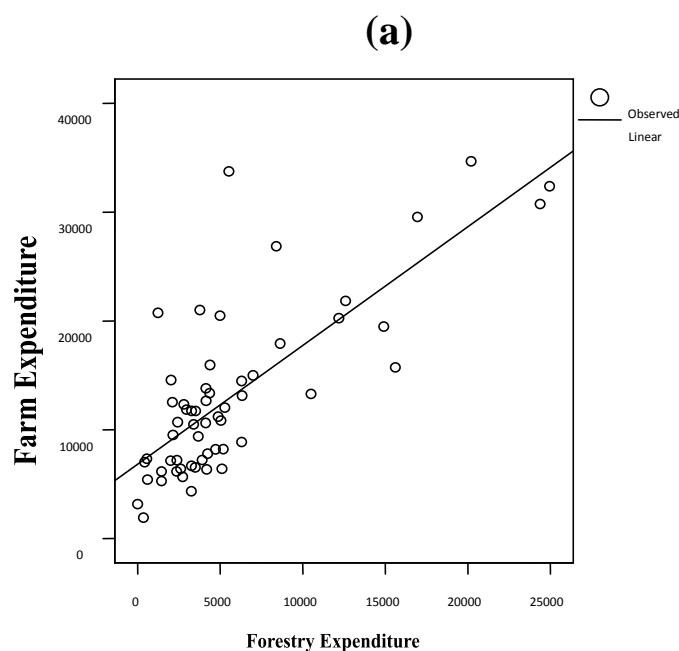
NC = Negligible correlation, LC = Low correlation, MC = Moderate correlation, SC = Substantial correlation, ^{VSC} = Very strong correlation. Values in parenthesis show P-value.

Linear regression analysis between Farm Expenditure and its components, Forest Expenditure, Agriculture Expenditure, and Livestock Expenditure, taking Farm Expenditure as dependent variable, revealed respective significant ($P \leq 0.001$); significant ($P \leq 0.001$); and significant ($P \leq 0.05$) directly proportional increasing trends (Table 5.4.10 & Figure 5.4.2). These regression equations and models indicate that, along with the CHT peoples' tendency to do forestry, many of the farmers' also possessed a substantial intention to increase their agricultural production as it is a major requirement for their livelihood. Greater investment in agriculture and its impact on farm income in the form of increased turnout obviously implied that greater expenditure was the basis for increased turnout, and that farmers were interested in investing more to grow food items. The same conclusion is moderately applicable in the case of Livestock production, also shown by regression models and equations. The above analysis infers that farmers' preference for growing farm products can be represented by the pattern Forestry < Agriculture < Livestock.

Table 5.4.10: Relationships between Farm Expenditure and its Components

Dependent Variable (Y)	Independent Variables (X)	Regression Equation	R	F	P-Value
Total Farm Expenditure	Forest Expenditure	$Y=6840.914 + 1.090X$	0.766	79.712	0.000***
Total Farm Expenditure	Agricultural Expenditure	$Y=7008.984 + 1.211X$	0.635	37.817	0.000***
Total Farm Expenditure	Livestock Expenditure	$Y=10365.172 + 1.200X$	0.376	8.563	0.005**

** = Significant at 0.01 level, *** = Significant at 0.001 level.



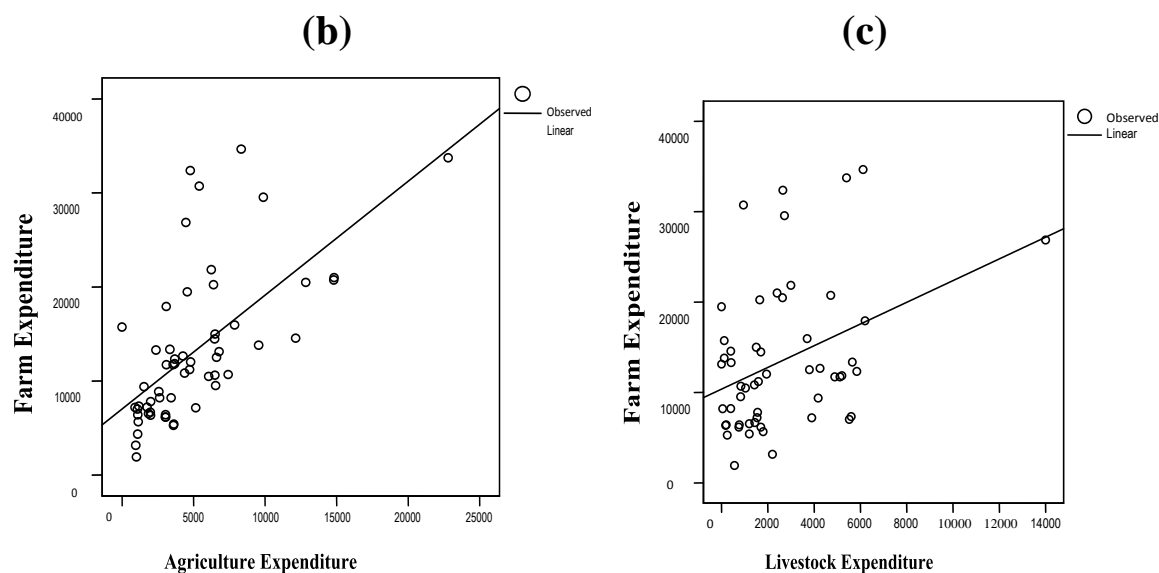


Figure 5.4.2: Regression Models between Farm Expenditure and its Components: (a) Forestry Expenditure; (b) Agriculture Expenditure; (c) Livestock Expenditure

Forestry Expenditure Components

As outlined earlier, participants of the study villages enjoyed forestry practices, incurring considerable expenditure to support them. Due to its being an important and non-negotiable element of participatory farming practice, expenditure for forestry practices was broken down into its components of Tree, Fruit and Bamboo. This further level of data was sought in order to assess the participating farmers' preference for these forms of forestry, which may be adapted as a general inference in relation to the indigenous people of CHT. Average village-wise and component-wise Forestry Expenditure of participants are shown in Table 5.4.11 (refer to Table 5.4.6 for Farm Expenditure components).

Table 5.4.11: Forestry Expenditure Components in 9 Villages of the CHT (in Taka)

Village	Organization	Forestry Expenditure			
		Tree	Fruit	Bamboo	Total
Longodu	FD	146.34 (4.17)	3363.33 (95.83)	0.00 (0.00)	3509.67 (100)
Alotila	FD	639.71 (22.39)	1596.43 (55.89)	620.43 (21.72)	2856.57 (100)
Babupara	FD	0.00 (0.00)	8099.60 (100)	0.00 (0.00)	8099.60 (100)
Banifulpara	FD	938.29 (25.69)	2714.57 (74.31)	0.00 (0.00)	3652.86 (100)
Kibukpara	CHTDB	0.00 (0.00)	1650.01 (100)	0.00 (0.00)	1650.01 (100)

Village	Organization	Forestry Expenditure			
		Tree	Fruit	Bamboo	Total
Gasbow	CHTDB	1451.40 (11.27)	11430.20 (88.73)	0.00 (0.00)	12881.60 (100)
Kemalongpara	NGO	207.60 (3.28)	6114.40 (96.72)	0.00 (0.00)	6322.00 (100)
Mathaipara	NGO	2256.00 (52.09)	2075.00 (47.91)	0.00 (0.00)	4331.00 (100)
Dulochari	NGO	0.00 (0.00)	7864.00 (100)	0.00 (0.00)	7864.00 (100)
	Total	5639.34 (11.02)	44907.54 (87.77)	620.43 (1.21)	51167.31 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

Organization-wise Variations among Forestry Expenditure Components

For all the three intervening agencies (FD, CHTDB and NGO), no significant variations were found in Forestry Expenditure (Table 5.4.12). The expenditure pattern showed that the FD beneficiaries had mean annual expenditure of Tk 4,932.35, which was not significantly different with that of the beneficiaries of CHTDB (Mean Tk 6,329.83) or NGO (Mean Tk 6,639.00). This inferred that though the forest or tree income of CHTDB varied significantly with that of FD and NGO due to their farmers' planting of rubber trees, overall expenditure incurred by organizations did not vary significantly. This indicated that similarity exists in all participants' decision not to invest much in long gestation forestry practices, even though in the long term substantial income generation is possible.

Table 5.4.12: Variations in Annual Forestry Expenditure between Organizations (in Taka)

Organization	Tree	Fruit	Bamboo	Total Forestry Expenditure
FD	432.87 ^a	4399.39 ^a	140.10 ^a	4972.35 ^a
CHTDB	604.75 ^a	5725.08 ^a	0.00 ^a	6329.83 ^a
NGO	902.53 ^a	5736.47 ^a	0.00 ^a	6639.00 ^a
F-ratio	1.824 ^{NS}	0.398 ^{NS}	2.261 ^{NS}	0.551 ^{NS}

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non -Government Organization. ^{NS} = Not significant.

Superscript with the same letter represented denotes no significant difference.

Forestry Expenditure Component Levels

Tree Expenditure Levels

Annual expenditure for the tree component was arranged into five groups to have the data in ordinal form as shown in Table 5.4.13. FD participants incurred expenditure in the lowest and lower middle levels only, at 74.2 and 25.8 percent respectively, thus it can be said they incurred low level expenses for trees. CHTDB participants incurred expenditure in the lowest, lower middle and middle levels, at rates of 58.3, 25 and 16.7 percent respectively. The middle level was only occupied by participants of Gasbow village. On the other hand, NGO participants covered all five levels of expenditure, with 60, 6.7, 13.3, 6.7 and 13.3 percent in the lowest, lower middle, middle, higher middle and highest levels respectively, indicating notable variation among the participants. It is mentionable here that NGO village Dulochari only occupied the lowest level, Mathaipara covered the lowest and lower middle levels, and Kemalongpara village covered the middle, higher middle and highest levels, the inference being that the participants of Kemalongpara of Caritas NGO were more motivated and aware about the importance of tree growing compared to the other two NGO villages.

This analysis indicates that high level tree expenditure was possible in both the context of GO and NGO villages, yet most participants were found not to expend such amounts on trees, indicating the need to motivate farmers about tree cultivation. To this end, the implementation of further motivational and capacity building activities by all organizations in general, with more emphasis in GO cases, is necessary. This also indicates the low level of participation of the participating farmers and the participating agencies in all the GO and NGO villages, except NGO village Kemalongpara and to some extent CHTDB village Gasbow.

Fruit Expenditure Levels

Data of annual expenditure for fruit incurred by the participants in all study villages was grouped in five levels, as shown in Table 5.4.13. It was observed that in FD villages, 83.9, 6.5, 3.2, and 6.5 of participants fell under the lowest, lower middle, middle and highest levels respectively. This indicates that most participants in FD villages incurred low level Fruit Expenditure (Tk 0-5,000). That some participants covered the highest level indicated the possibility of higher level expenditure incurrence for fruits. In the CHTDB case, 58.3, 8.3, 25 and 8.3 of participants covered the lowest, lower middle, middle and higher middle levels respectively. This indicates that though the majority of participants in CHTDB villages incurred fruit expenditure at the lowest level, some participants expended at comparatively higher

levels, indicating the possibility of high level expenditure. Fruit Expenditure of NGO participants fell under the lowest, lower middle and middle levels only, at rates of 53.3, 26.7 and 20 percent respectively. This implies, as in GO cases, that though there was scope and evidence of incurring higher level expenses for fruit, the majority of participants' expenditure registered at the lowest level. Although some FD, CHTDB and NGO participants showed expenditure greater than at the lower levels, only a few (6.5%) FD participants demonstrated expenditure at the highest level. It can be inferred that, to some extent, GO participants were found in the overall context to be comparatively a bit more interested in growing fruit bearing trees than NGO participants. This posits the necessity to adapt more or less similar steps or activities as were suggested in the case of Tree Expenditure, by both concerned GO and NGO agencies.

Bamboo Expenditure Levels

Annual Bamboo Expenditure of study participants was grouped in five levels, as shown in Table 5.4.13. In FD villages it was observed that 83.9, 6.5, 3.2, and 3.2 and 3.2 of participants fell under the lowest, lower middle, middle, higher middle and highest levels respectively. This indicates that most of the participants in FD villages incurred expenditure for bamboo that fall under lowest level of Tk 0-300. That some participants reached the higher levels indicated the possibility of high level incurrence of Bamboo Expenditure. It is mentionable here high Bamboo Expenditure was incurred only by participants in FD village Alotila, with the other three villages exhibiting zero bamboo expenditure. As noted previously, there was no bamboo expenditure in any CHTDB or NGO villages. It can be seen that bamboo cultivation has not spread as a common land use practice, thereby indicating the need to devise appropriate steps to expand cultivation of this important short-term income generating minor forest produce.

Relationships among Forestry Expenditure Components

Taking into account all the study villages as a whole, correlation between the variables: Total Forestry Expenditure (Mean 5,684.24; SD 5,544.125; N 58), Tree Expenditure (Mean 589.90; SD 793.660; N 58), Fruit Expenditure (Mean 5,019.47; SD 5,610.742; N 58) and Bamboo Expenditure (Mean 74.88; SD 255.765; N 58) showed that there was a negligible relationship between Forest Expenditure and Tree Expenditure ($P \leq 0.05$), a very strong relationship between Forest Expenditure and Fruit Expenditure ($P \leq 0.001$) and a low negative relationship between Forest Expenditure and Bamboo Expenditure ($P \leq 0.05$) (see Table 5.4.14). This indicates that participating farmers incurred expenditure in relation to all three forestry components, placing in comparison more emphasis on fruit followed by lower

emphasis on trees and negligible emphasis on bamboo. This indicates that short-term profitable income generating species were desired by farmers. Ironically, however, most of them did not know about the importance of bamboo as short-term income generating species. Nevertheless, this conclusion cannot fully ignore the forest tree-loving nature of CHT people due to the fact that forest trees require much less expenditure for their maintenance.

Table 5.4.13: Organization-wise Numbers of Participants in each of the Five Divided Forestry Expenditure Component levels for (a) Tree; (b) Fruit; (c) Bamboo Separately

<i>(a) Tree Expenditure Level (in Taka)</i>						
<i>Organization</i>	0-700 ¹	701-1400 ²	1401-2100 ³	2101-2800 ⁴	2801-3500 ⁵	Total
FD	23 (74.20)	8 (25.80)	0 (0.00)	0 (0.00)	0 (0.00)	31 (100)
CHTDB	7 (58.30)	3 (25.00)	2 (16.70)	0 (0.00)	0 (0.00)	12 (100)
NGO	9 (60.00)	1 (6.70)	2 (13.30)	1 (6.70)	2 (13.30)	15 (100)
Total	39 (67.24)	12 (20.69)	4 (6.90)	1 (1.72)	2 (3.45)	58 (100)
<i>(b) Fruit Expenditure Level (in Taka)</i>						
<i>Organization</i>	0-5000 ¹	5001-10000 ²	10001-15000 ³	15001-20000 ⁴	20001-25000 ⁵	Total
FD	26 (83.90)	2 (6.50)	1 (3.20)	0 (0.00)	2 (6.50)	31 (100)
CHTDB	7 (58.30)	1 (8.30)	3 (25.00)	1 (8.30)	0 (0.00)	12 (100)
NGO	8 (53.30)	4 (26.70)	3 (20.00)	0 (0.00)	0 (0.00)	15 (100)
Total	41 (70.69)	7 (12.07)	7 (12.07)	1 (1.72)	2 (3.45)	58 (100)
<i>(c) Bamboo Expenditure Level (in Taka)</i>						
<i>Organization</i>	0-300 ¹	301-600 ²	601-900 ³	901-1200 ⁴	1201-1500 ⁵	Total
FD	26 (83.90)	2 (6.50)	1 (3.20)	1 (3.20)	1 (3.20)	31 (100)
CHTDB	12 (100)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	12 (100)
NGO	15 (100)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	15 (100)
Total	53 (91.38)	2 (3.45)	1 (1.72)	1 (1.72)	1 (1.72)	58 (100)

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non-Government Organization. Values in parenthesis indicate percentage.

^{1, 2, 3, 4, 5} indicate lower, lower middle, middle, higher middle, higher levels respectively.

Table 5.4.14: Correlation between Total Forestry Expenditure and its Components (in Taka)

Variable	Correlation Coefficient			
	Tree Expenditure	Fruit Expenditure	Bamboo Expenditure	Forestry Expenditure
Tree Expenditure	-	- 0.113 ^{LC} (0.399)	0.029 ^{NC} (0.830)	0.030 ^{NC} (0.821)
Fruit Expenditure	- 0.113 ^{LC} (0.399)	-	- 0.155 ^{LC} (0.245)	0.989 ^{VSC} (0.000)
Bamboo Expenditure	0.029 ^{NC} (0.830)	- 0.155 ^{NC} (0.245)	-	- 0.107 ^{LC} (0.425)
Total Forestry Expenditure	0.030 ^{NC} (0.821)	0.989 ^{VSC} (0.000)	- 0.107 ^{LC} (0.425)	-

^{LC} = Low correlation, ^{NC} = Negligible Correlation, ^{VSC} = Very strong correlation.

Linear regression analysis between Total Forestry Expenditure and Tree Expenditure, Fruit Expenditure, and Bamboo Expenditure, taking Total Forestry Expenditure as the dependent variable, showed non-significant ($P \leq 0.05$) directly proportional, significant ($P \leq 0.001$) directly proportional, and non-significant ($P \leq 0.05$) inversely proportional trends, respectively (see Table 5.4.15 and Figure 5.4.3). This indicates that farmers used most forestry inputs for annual and/or short-term income generating forestry items, i.e. fruits. Once again, this signifies that annual and/ or short-term income generation was an inherent tendency of the participants' farming practices, being particularly applicable in the case of forestry.

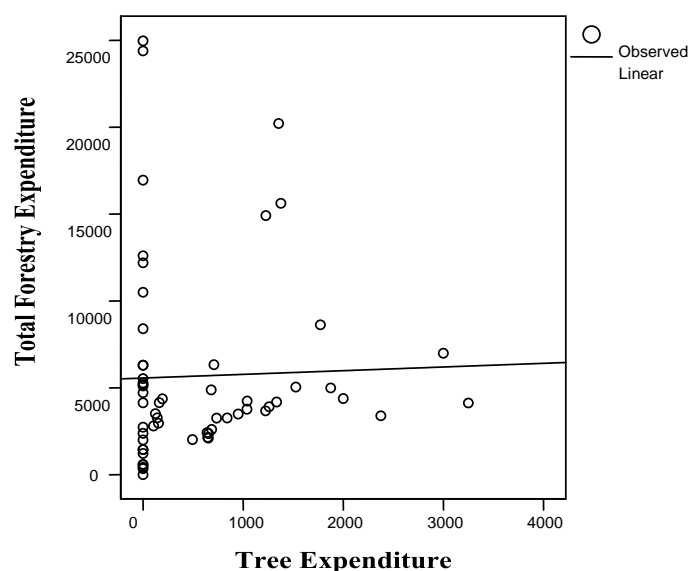
Table 5.4.15: Relationships between Forestry Expenditure and its Components (in Taka)

Dependent Variable (Y)	Independent Variables (X)	Regression Equation	R	F	P-Value
Total Forestry Expenditure	Tree Expenditure	$Y = 5557.392 + 0.212X$	0.030	0.051	0.821 ^{NS}
Total Forestry Expenditure	Fruit Expenditure	$Y = 780.385 + 0.977X$	0.989	2437.449	0.000 ^{***}
Total Forestry Expenditure	Bamboo Expenditure	$Y = 5857.493 - 2.314X$	-0.107	0.645	0.425 ^{NS}

^{NS} = Not significant, ^{***} = Significant at 0.001 level

From the data and discussions above, there clearly exists the need to take necessary steps to increase awareness about the importance of forest trees as a means of land and soil protection in the overall environmental context in hilly areas such as CHT. Similarly, the large income generating opportunity that forest trees offer, along with the short-term income generating potential of bamboo and other minor forest produce, make forestry suitable for poor farmers.

(a)



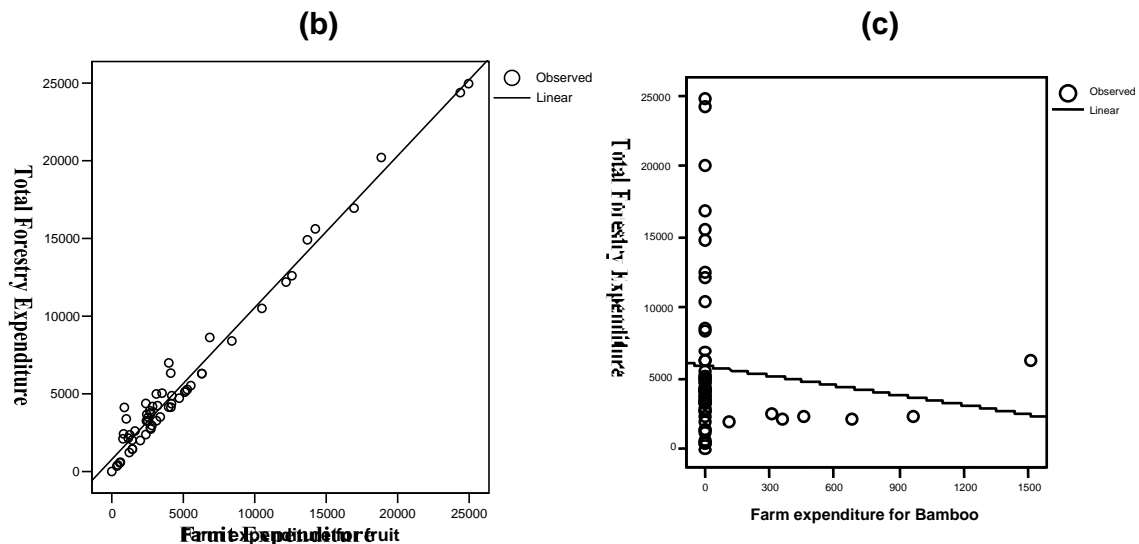


Figure 5.4.3: Relationships between Total Forestry Expenditure and its Components: (a) Tree Expenditure; (b) Fruit Expenditure; (c) Bamboo Expenditure

Social Expenditure

Social expenditures include expenses for study participants' children's education, to fulfil the needs of family health-related matters such as consultation with doctors and purchase of medicine, to fulfil the needs for clothing, entertainment of guests, and religious and other festivals. These expenditures act as indicators of social upliftment in society. The components of social expenditure are calculated individually and analysed alongside the Total Social Expenditure. Thereafter, the Total Income and Farm Income were posited against the Total Social Expenditure to understand the degree of social upliftment of the participants from PF activities.

Organization-wise Variation among Social Expenditure Components

For all three intervening agencies (FD, CHTDB and NGO), variation was found in participants' dress, festival and entertainment expenses, which ultimately resulted in variation in Total Social Expenditure, even with the insignificant variation in education and health expenses, as shown in Table 5.4.16. The Education expenditure of beneficiaries under FD (Mean Tk 1,845.81), CHTDB (Mean Tk 3,991.67) and NGO (Mean Tk. 1,886.67) projects showed non significant ($P \leq 0.05$) variation, suggesting that all three categories of participants were similarly conscious about the importance of their children's' education. Similar findings were observed in case of Health expenditure, with figures for FD (Mean Tk 1,800.00), CHTDB (Mean Tk 2,233.33) and NGO (Mean Tk 3,486.67) also showing non-significant variation.

On the other hand, in the case of Dress, the expenditure pattern showed that the beneficiaries of FD (Mean Tk 2,229.03) projects expended significantly ($P \leq 0.01$) less money than those of CHTDB (Mean Tk 4,508.33) and NGO (Mean Tk 4,966.67) projects. This may be due to the presence of comparatively richer participants in CHTDB and NGO villages. Likewise, the Entertainment expenditure pattern of FD (Mean Tk 1,787.10), CHTDB (Mean Tk.3,116.67) and NGO (Mean Tk 3,893.33) lead to similar observations and may be understood similarly. The Festival expenses of FD beneficiaries (Mean Tk 2,711.29) were also significantly ($P \leq 0.01$) lower than those of CHTDB (Mean Tk 4,416.67) and NGO (Mean Tk 5,606.67) beneficiaries. CHTDB festival spending showed partial significant variation with FD as well as NGO expenditure. This partially significant variation pattern of CHTDB participants is created by the mix of having significantly higher expenses than FD participants as well as non-significant lower expenses compared to NGO participants. This is an indication of the sharply visible pattern of variation as well as similarity among beneficiary types.

Table 5.4.16: Variations in Social Expenditure Components between Organizations (in Taka)

Organization	Education	Health	Dress	Entertainment	Festival	Total Social Expenditure
FD	1845.81 ^a	1800.00 ^a	2229.03 ^b	1787.10 ^b	2711.29 ^b	9931.29 ^b
CHTDB	3991.67 ^a	2233.33 ^a	4508.33 ^a	3116.67 ^a	4416.67 ^{ab}	22625.00 ^a
NGO	1886.67 ^a	3486.67 ^a	4966.67 ^a	3893.33 ^a	5606.67 ^a	19766.67 ^a
F-ratio	1.338 ^{NS}	2.123 ^{NS}	5.910 ^{**}	3.896 [*]	3.423 ^{**}	5.480 ^{**}

FD = Forest Department, CHTDB = Chittagong Hill Tracts Development Board, NGO = Non -Government Organization.

^{NS} = Not significant, * Significant at 0.05 level, ** = Significant at 0.01 level, *** = Significant at 0.001 level.

Superscript with the same letter represented denotes no significant difference.

Relationships among Social Expenditure Components

Taking into account all the study villages as a whole, correlation between the following variables was performed: Total Social Expenditure (Mean Tk 15,101.21; SD 13,917.202; N 58), Education Expenditure (Mean Tk 2,300.34; SD 4,045.572; N 58), Health Expenditure (Mean Tk.2,325.86; SD 2,659.413; N 58), Dress Expenditure (Mean Tk. 3,408.62; SD 3,054.205; N 58), Entertainment

Expenditure (Mean Tk. 2,606.90; SD 2,625.908; N 58) and Festival Expenditure (Mean Tk. 3,812.93; SD 13,917.202; N 58). These calculations revealed that there was a substantial relationship between Total Social Expenditure and Education Expenditure ($P \leq 0.001$), a very strong relationship between Total Social Expenditure and Health Expenditure ($P \leq 0.001$), a very strong relationship between Total Social Expenditure and Dress Expenditure ($P \leq 0.001$), a very strong relationship between Total Social Expenditure and Entertainment Expenditure ($P \leq 0.001$), and a substantial relationship between Total Social Expenditure and Festival Expenditure ($P \leq 0.001$) of the participants (see Table 5.4.17). This indicates that participants spend their income as socially required in all categories, placing comparatively more emphasis on health, dress and entertainment. This finding is consistent with the healthy and beautiful nature of indigenous people of CHT that is generally symbolised through the colourful and beautiful dresses and beauty consciousness of the young boys and girls. The substantial expense incurred by participants to educate their children is an indication of their awareness about the importance of education for the future generation. Expenses incurred for different religious and social gatherings were an indication of the festival-loving nature of the indigenous people of CHT.

Table 5.4.17: Correlation between Social Expenditure and its Components (in Taka)

Variable	Correlation Coefficient					
	Education	Health	Dress	Entertainment	Festival	Social Expenditure
Education	-	0.589 ^{SC} (0.000)	0.536 ^{SC} (0.000)	0.497 ^{SC} (0.000)	0.341 ^{MC} (0.000)	0.651 ^{SC} (0.000)
Health	0.589 ^{SC} (0.000)	-	0.745 ^{VSC} (0.000)	0.770 ^{VSC} (0.000)	0.526 ^{SC} (0.000)	0.846 ^{VSC} (0.000)
Dress	0.539 ^{SC} (0.000)	0.745 ^{NC} (0.000)	-	0.673 ^{SC} (0.000)	0.506 ^{SC} (0.000)	0.825 ^{VSC} (0.000)
Entertainment	0.497 ^{MC} (0.000)	0.770 ^{VSC} (0.000)	0.673 ^{SC} (0.000)	-	0.457 ^{MC} (0.000)	0.721 ^{VSC} (0.000)
Festival	0.341 ^{MC} (0.009)	0.526 ^{SC} (0.000)	0.506 ^{SC} (0.000)	0.457 ^{MC} (0.000)	-	0.654 ^{SC} (0.000)
Total Social Expenditure	0.651 ^{SC} (0.000)	0.876 ^{VSC} (0.000)	0.825 ^{VSC} (0.000)	0.721 ^{VSC} (0.000)	0.654 ^{SC} (0.000)	-

NC = Negligible correlation, MC = Moderate correlation, SC = Substantial correlation. Values in parenthesis show P-value.

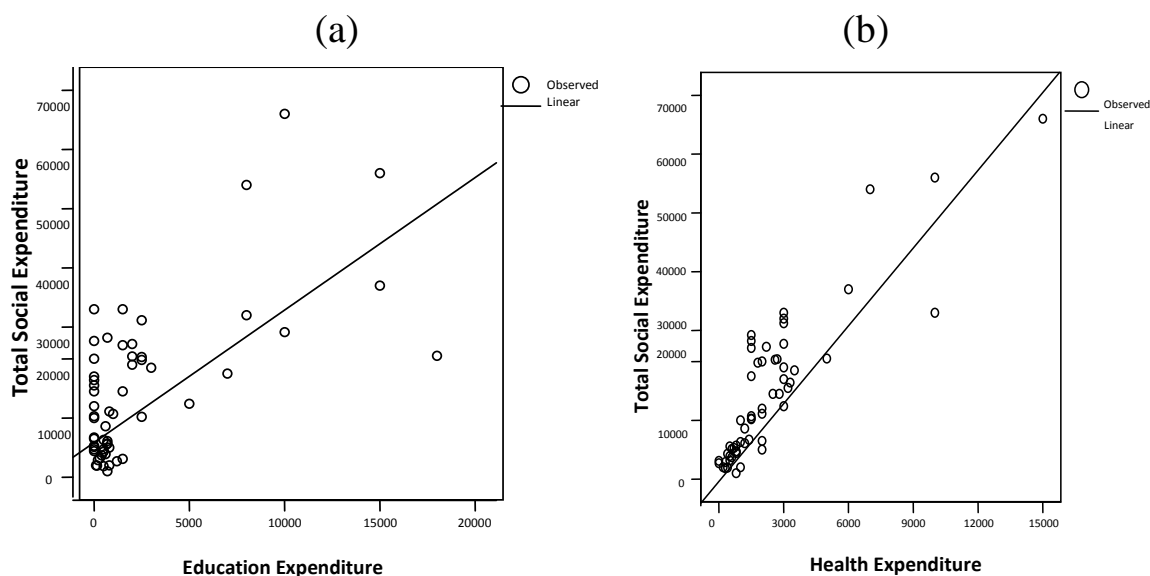
Linear regression analysis of Total Social Expenditure with Education Expenditure, Health Expenditure, Dress Expenditure, Entertainment Expenditure and Festival Expenditure, taking Total Social Expenditure as the dependent variable, showed significant ($P \leq 0.001$) directly proportional increasing trends in each category individually (see Table 5.4.18 and Figure 5.4.4). This indicates, as per regression equation and models, that sufficient social consciousness had developed among PF participants, and therefore they expended significant income towards all the social expenditure components in a holistic manner.

Table 5.4.18: Relationships between Social Expenditure and its Components (in Taka)

Dependent Variable (Y)	Independent Variables (X)	Regression Equation	R	F	P-Value
Social Expenditure	Education	$Y = 9953.140 + 0.2.238X$	0.651	-	0.000***
Social Expenditure	Health	$Y = 4436.376 + 4.585X$	0.876	185.097	0.000***
Social Expenditure	Dress	$Y = 2280.203 + 3.761X$	0.825	119.749	0.000***
Social Expenditure	Entertainment	$Y = 5135.292 + 3.823X$	0.721	-	0.000***
Social Expenditure	Festival	$Y = 5929.929 + 2.405X$	0.654	41.779	0.000***

*** = Significant at 0.001 level

Participants' significant expenditure for their children's education indicated their awareness about the advantages of education for social strengthening. Furthermore, CHT peoples' tendencies to maintain good health and to be well dressed, as well as their customary eagerness to entertain guests and partake in festivals, were clearly reflected.



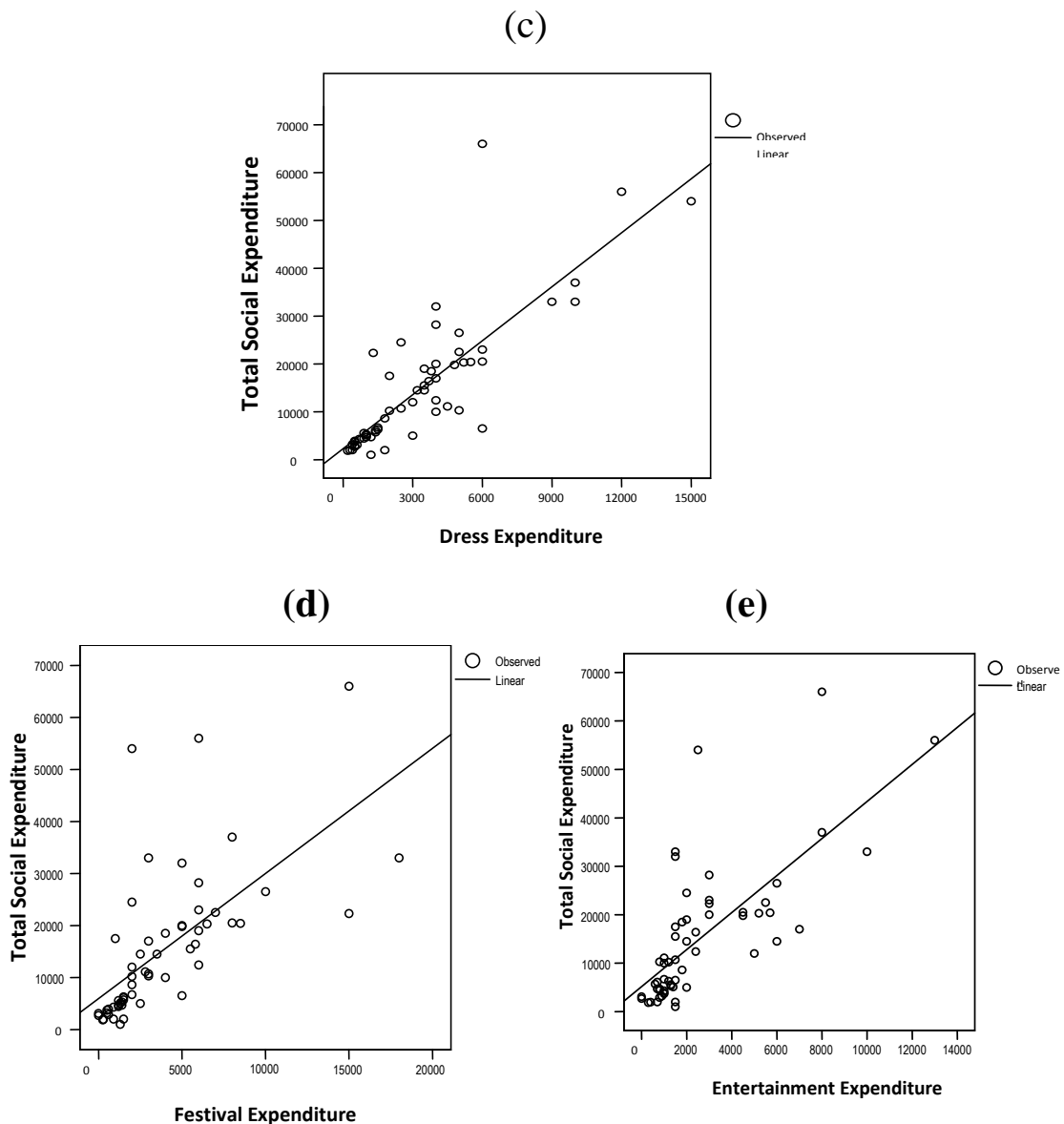


Figure 5.4.4: Regression Models between Social Expenditure and its Components: (a) Education Expenditure; (b) Health Expenditure; (c) Dress Expenditure; (d) Festival Expenditure; (e) Entertainment Expenditure

Discussion about expenditure patterns

It was found that all participants from the 9 villages studied more or less incurred expenditures as grouped under three major headings as: Farm Expenditure, Food Expenditure and Social Expenditure. The values of these expenditure components varied among the participants of each village and also among villages, which lead to variations in the total expenditures between the villages accordingly. It was observed that comparatively rich participants, i.e., those having higher yearly income, incurred greater expenditure in farming, indicating the dependency of expenditure incurrence on participants' respective

earnings. It was also found that those who incurred greater expenditure in farming obtained more income. It is mentionable here that all the participants were found to be reasonably conscious about the need to earn more and that more earnings required more input. However, the majority of participants, though conscious about it, did not invest substantially for their farming. Therefore, it is necessary to take steps to discover the reasons and design remedial measures, which requires policy as well as functional level interventions in the overall context of CHT.

Expenditure levels of all the three said components showed that the majority of participants incurred low level expenditure with the exception of a few participants who incurred higher levels. Again, their major income source was farm income. The farm component income levels also showed that most participants obtained low levels of income with a few participants obtaining higher levels. Hence, it may be concluded that those participants who had more income incurred more expenditure, and the expenditure incurrence was in accordance with the income generated mainly from farming practices, though off-farm income also contributed. The majority of participants found to have low level income also had low level farm income and incurred low levels of expenditure, and the few participants who had comparatively higher levels of income had higher levels of expenditure, indicating that more expenditure for farming practices resulted in greater farm income. Participants' farm income ultimately contributed to other components of Farm Expenditure, Food Expenditure and Social Expenditure, accordingly. This finding indicated the need to take appropriate steps to increase the income of participants so that they, in the future, could incur more expenditure in farming practices to generate more income. This also requires in-depth study to source the reasons for low income and devise possible remedial steps.

Participants' Farm Expenditure was classified into Forestry, Agriculture and Livestock Expenditure. Forestry Expenditure was further sub-divided into Tree, Fruit and Bamboo Expenditure. Forestry Expenditure was found to mainly be for fruit production, with comparatively very low incurrence for timber trees. The incurrence for bamboo production was almost zero. This indicated that participants wanted to produce short-term income generating fruit trees and economic timber trees.

Participants were aware about the need to plant environmentally-friendly trees that suited topography and watershed requirements. However, their need for quick income overtook the success of these awareness campaigns. Therefore, the issue of ecologically suitable species selection should be addressed properly in future PF programmes. Participant livelihood need-based surveys and studies will provide assistance in determining the means to address these issues. As forestry practice is a non-negotiable determinant in PF activities in such a hilly region, this issue can be better addressed by providing farmers with a basket of suitable fruit species that yield timber as well from which to choose from. High yielding ecologically viable timber species, incorporating existing farmers' desire for profitable trees, can be planted in suitable lands. The fact that timber trees require less expenditure for maintenance and can provide a bulk amount of income at one time after maturity, should be publicised to CHT farmers.

Further, arrangements to provide farmers with high yielding inputs free of charge or at a reasonable price, may be an added strategy. However, providing such facilities may make encourage the participants to have the view that they will always receive such help from PF agencies. To mitigate this, and to make farmers able and self-sustaining in the future, a system may be developed where a portion of their farm income is put away as savings.

Agriculture and livestock practices need to be encouraged by providing genetically-improved species and inputs. Analysis of the variation showed that significant variations were found in Agricultural Expenditure by NGO participants compared to FD and CHTDB participants. NGO participants were found to be comparatively more interested in agriculture. It may be mentioned here that, farmers' inherent wish to earn money in a short time span was more clearly reflected in NGO cases due to the security of their land tenure. Farmers' interest in a particular land use should not be discouraged, but rather may be encouraged for land and topography based environmentally friendly land use practices through awareness campaigns and associated measures.

The majority of study participants incurred low level expenses for farming components. Incurrence of expenditure in the high levels was also observed. This indicates that most participants did not work to their highest capability to earn high incomes, or are not capable of that due to factors that hinder their work intensification. This suggests the

need to take necessary steps to find out the reasons for this through in-depth studies and to build farmer capacity as much as possible. Relationships among the farming components showed that participants incurred the highest expenditure for Forestry, followed by Agriculture and then Livestock. This indicates the forestry-loving tendency of CHT people, most directly reflected in the form of agro-forestry practices. Relationship analysis also inferred that, along with their forestry-loving tendency, farmers also incurred significant expenditure for agricultural production as it formed a major requirement for their livelihood. Their interest in growing food items was visibly reflected through short-term agricultural practices and fruit production as well as moderate livestock rearing for meat production.

Most participants were found to be less interested in incurring expenditure for timber tree growing. However, a few exceptions were also found. This is also an indication that farmers' knowledge about the low maintenance and expenditure requirements for timber trees was poor, or that farmers had less interest in forest tree growing due to the long-term commitment required for trees to reach maturity for harvesting. However, farmers were generally found to be aware about the environmental need for tree growing and propagation. Therefore, this issue may be addressed not only from a technical aspect, but also from human dimensional economic and social aspects. Fruit tree planting campaigns need to be continued and may be improved by introducing fruit-bearing timber trees in combination with other economic horticultural species. The necessary expenditure incurrence needs to be supplemental and complemented by PF agencies through various available means.

Participants did not incur any expenses for bamboo production. They were not aware about the benefits of planting and maintaining bamboo as a short-term income generating minor forest produce. They even did not know about the improved technology in low-cost bamboo cultivation. This inferred the need to train farmers in such cultivation technology, as well as disseminate information about the opportunities of economic return and marketing facilities for bamboo.

All study participants were found to be incurring expenditure for various social activities. Expenditure for their family health, education, colourful quality dress, entertaining guests and participation in festivals and religious events were found to be common expenditures for participants in all 9 villages. The FD and CHTDB participants, being landless before the inception of the projects, incurred expenditures on a

small scale for health and dress. Medical treatment and medicine purchase was a bare necessity and thus an unavoidable expenditure they were bound to incur. Due to PF interventions, their income increased and therefore, their expenditure incurrence for health and dress increased significantly. NGO participants incurred all categories of social expenses on a comparatively small scale before the project scenario, and increased significantly after the interventions. This indicated participants' significant social upliftment due to PF projects.

Variation analysis showed that there were significant variations among FD, CHTDB and NGO beneficiaries in dress, entertainment and festival expenses and that variation in health and education was insignificant. Thus, the social accountability of the participants was indicated by their willingness to expend funds for each of the componential expenses. Non-significant variation among the beneficiaries in expenditure for health and for education of their children and the variations in the other said components were due to the fact that poor participants could not expense similar amounts of money to richer participants. However, awareness about the need to incur social expenses and emphasis placed on education of their children and maintenance of good health was common to all. This indicates perception of the need and advantage of education for social strengthening by both poor and rich participants. This observation necessitates the adoption of various technical service provision assisting measures to increase incomes of PF participants. PF agencies may encourage the poor participants by providing incentives for various social activities. Healthcare and education should be enhanced by providing required improvements to facilities.

Observations inferred that CHT people, particularly women, are very much fond of colourful clothing. They are generally very hospitable in nature. Participants' significant expenditure incurrence in socially-necessitated activities demonstrated the healthy and beautiful nature of the indigenous people of CHT, reflected through their colourful dress, good health and beauty consciousness. Their hospitable nature and festive interest are consistent with the well known cultural tradition of indigenous communities and were similarly evident by significant expenditure incurrence for such activities. Hence, their awareness about the need of their children's' education for social strengthening, inherent tendency to maintain good health and beauty, eagerness to entertain guests and festive nature should be encouraged by providing facilities for such activities and maintaining consistency with their tradition and culture.

PF participants' social upliftment impacted on the surrounding areas resulting in linkages with inhabitants of neighbouring areas, exemplified through increased travel, the establishment of marriage relationships, invitation and receipt of invitations for various festival and religious events and ceremonies, etc. Local leaders and influential people established linkages with PF farmers with respect. Farmers expressed a sense of honour at having land and farming facilities as PF participants. However, a few FD and CHTDB participants felt that the inhabitants from surrounding areas still considered them inferior. NGO participants from long-established villages considered their social status to have improved due to being involved in PF activities. PF farmers' sense of recognition and esteem has the potential to further improve with increase of their income, which will enhance their ability to be more intensely involved in various social activities. The prospect of obtaining a lump sum of income from timber trees after their maturity period will provide an opportunity to cross a threshold to abruptly advancing their social status level further.

Participation

In order to assess the general nature and extent of participation, the opportunity indicators and prevalence indicators from Uphoff (1982) and Zaman (1984), as noted in the logical framework and methodological aspects of the study, were observed, analysed and evaluated. It was found that in all the study villages, participation was the major naming feature used by the agencies in anchoring all the respective interventions. The extent of the participation between the participants and the participating agencies as well as any variation that exists among of beneficiary types (FD, CHTDB and NGO) were attempted to be understood to provide general inferences based on the said indicators of participation.

Opportunity indicators

The extent of opportunity or access to PF that was available to the participants through the participating agencies was assessed by the following opportunity indicators: i) Decentralization, ii) Linkages, iii) Flexibility and iv) Incentives.

Decentralization

In all 9 PF projects investigated under this research study, the farmers were not always so empowered that their ideas and opinions would significantly influence decisions. The major decisions and operations

were obviously fixed by the project agencies. At the operational and/or implementation stage, some ideas and opinions of the PF agency staff were shared with the participants in such a way that created a patronising effect. It was found that in paper work, some formal responsibilities were delegated to farmers, more predominantly seen in NGO projects, but in reality the top-down approach was highly influential and therefore GO and NGO projects could not be declared decentralized. However, an increasing decentralizing trend was observed in gradual incorporation in recent projects, as compared to near absence in the older projects. Thus, it may be concluded that PF project interventions in CHT are not decentralized, but may be considered in a stage of proceeding towards partial decentralization. This is evident in some minor responsibilities for decisions and operations gradually vested to the participants, though the overall functioning of the projects was still found to be highly dominated by the project agencies. This indicated a need for knowledge-based empowerment of the stakeholders, so that decentralized decision-making power can be a platform for effective and functional implementation of the adopted PF activities.

Linkages

In almost all the accessible areas of CHT where Participatory Forestry was practiced under GO and NGO interventions, established offices were found within 1-20 kilometres of each of the 9 villages under study. This proximity facilitated the establishment and enhancement of linkages among PF participants and implementing agencies. All participants, key informants and personnel from intervening agencies under this study made similar comments that during project periods there were more or less countable regular linkages among them, but after the end of the project links gradually decreased and ultimately reached their present stage of mere occasional connection. This phenomenon was more or less applicable for both GO and NGO cases. In addition, linkages and flow of information between local, district and central agency offices were irregular. All the GO and NGO participating agencies claimed that they were in strong cooperative and collaborative linkages with their respective participating farmers, yet repeated informal discussions with the farmers as well as agency personnel of lower and mid-level positions revealed feelings of the required linkages being intermittent, and as such may be inferred as generally irregular.

Flexibility

In all the GO interventions, projects were mainly centrally designed and passed on to field staff for implementation. Little flexibility for different items to be implemented was provided; they were also centrally designed. In FD cases, area and site selection was performed by the project agency. Regarding input selection for agri-crops and livestock, FD provided sufficient yet somehow restricted flexibility. However, for forest species selection of some species was prescribed and flexibility was provided only to select from among the prescribed species, so it can be inferred as partial flexibility. For some implementing tasks (such as maintenance, harvesting and marketing), comparatively higher flexibility was provided by FD. In CHTDB cases, as compared to FD, less flexibility was provided.

As NGO projects targeted private and occupied *jhum* lands, site selection was vested to farmers, with some advisory suggestions and specific conditions delegated by the given NGO. These were found to vary in respect to different NGOs, thus NGO site selection may be described as partially flexible. NGO input selection was found to be similar to GO cases, where forestry was somehow restricted to specific selecting species and agri-crops, and other selections vested to farmers with some advisory restrictions. The implementation of forestry maintenance practices in NGO projects was restricted by specific procedural bindings, while the harvesting, etc. of agri- and other crops were found to be more flexible. Flexibility provided by GO and NGO projects are shown in more detail by describing the prevalence indicator 'Decision Making and Implementation' on page 311, and in Tables 5.5.1 and 5.5.2.

The overall findings and observations show that, though both GOs and NGOs claimed that they provided sufficient flexibility to participants in the name of Participatory Forestry, projects were mostly underpinned by top-down ideology and thus managed. NGOs did provide comparatively more flexibility than GOs. However, it was also observed that the greater flexibility provided by NGOs resulted in cultivation of soil-damaging and erosion-enhancing species banana in the hill slopes by Jabarang NGO farmers, yet this was an isolated case and cannot be generalised.

Incentives

FD participants were given a definite piece of government land to live on and practice farming for their livelihood. Each family was provided

with a thatched house for living, seeds, seedlings and cutting as farm inputs. Additionally, they were offered the opportunity to work on FD PF farms during plantation work and given subsequent maintenance work as paid labour. All the benefits arising out of farming production were allocated to the participants. Moreover, in the nearby settlements, participants were given work as paid labour in FD forestry plantations. As an incentive to maintain and guard FD forest, participants also received a fixed share of intermediate and final harvesting. CHTDB participants were provided with thatched housing and land for living and small-scale farming. Cooking utensils were also given to the participants. A major portion of CHTDB projects' forestry land was utilised for rubber plantation, where participants were allowed to work as paid labour, as well as sharing in the benefits for the rubber latex collected. NGOs also provided incentives in the form of seeds, seedlings, cutting, etc. In this way, different forms of incentives encouraged farmers to settle and participate in PF farming practices.

However, with very few exceptions, these incentives were provided at one time. To sustain the interest of the participants, incentives should not be occasional, but should be continued on a need basis by surveying the participants' needs regularly.

Prevalence indicators

The nature of participation was assessed by the prevalence indicators i) Decision Making and Implementation, ii) Monitoring and Evaluation and iii) Benefit Sharing.

Decision Making and Implementation

All the 9 PF projects studied were found to be planned and administered by the respective agencies. Guidelines for the selection of beneficiaries and site were prescribed by the agencies concerned. There was some room for choice of species by the participants, but the silvicultural technologies were prescribed by the agencies. Technological guidelines were found to be similar for all agencies, which was actually technology developed by the Forest Department, with only the mode of implementation differing between agencies. Decision making and implementation responsibilities in the 9 study villages of CHT are shown from the PF agency perspective and participants' view in Table 5.5.1 and 5.5.2 respectively.

It was found that for operational and management tasks, benefit sharing, and monitoring and evaluation, both the PF agencies and farmers identified that discussions occurred prior to making decisions. However, final decisions were highly dominated by the concerned PF agencies. Overall, NGOs were found to be most flexible, followed by

FD and then CHTDB. Additionally, agency personnel' and participants' perspectives varied in almost all categories. However, the configuration of this variation was found to be of low significance. Hence, from the low level variation of views about the decision making and implementation of the above-mentioned tasks, it is evident that there was at least partial participation established between the PF agencies and their participants. Nonetheless, due to the obvious dominance over deciding factors from the PF agency side, participation in decision making and implementation in all CHT PF projects studied was found to be very limited.

Table 5.5.1: Organizations' Views of Prescriptions about Degree of Participation in Major Decisions Related to Management and Operational Tasks.

Activities		Management Tasks (Organizations' Views) (%)					
		FD		CHTDB		NGO	
		Decision Making by Project Agency	Decision Making by Participants	Decision Making by Project Agency	Decision Making by Participants	Decision Making by Project Agency	Decision Making by Participants
1	Site Selection	97.50	2.50	100.00	00.00	13.33	86.66
2	Planning and Decision about what to Plant	76.25	23.75	100.00	00.00	60.00	40.00
3	Organising Planting Operation	82.50	17.50	50.00	00.00	33.33	66.66
4	Managing Plantation	50.00	50.00	75.00	25.00	10.00	90.00
5	Distributing the Produce after Harvesting	125.00	00.00	80.00	20.00	00.00	100.00
6	Marketing	95.00	5.00	90.00	10.00	00.00	100.00
		Operational Tasks (Organizations' Views) (%)					
1	Nursery Raising	90.00	10.00	100.00	00.00	11.66	88.33
2	Land Protection	90.00	10.00	100.00	00.00	00.00	100.00
3	Watering	70.00	30.00	50.00	50.00	00.00	100.00
4	Weeding	70.00	30.00	50.00	50.00	6.66	93.33
5	Fertilising	80.00	20.00	90.00	10.00	33.33	66.66
6	Crop Protection	37.50	62.50	50.00	50.00	26.66	93.33
7	Extraction	75.00	25.00	100.00	00.00	00.00	100.00
		Participatory Benefit and Assessment (Organizations' Views) (%)					
1	Benefit Sharing	100.00	00.00	80.00	20.00	00.00	100.00
2	Monitoring & Evaluation	100.00	00.00	100.00	00.00	16.66	83.33

Table 5.5.2: Participants' Views of Prescriptions about Degree of Participation in Major Decisions Related to Management and Operational Tasks

Activities		Management Tasks (Participants' Views) (%)					
		FD		CHTDB		NGO	
		Decision Making by Project Agency	Decision Making by Participants	Decision Making by Project Agency	Decision Making by Participants	Decision Making by Project Agency	Decision Making by Participants
1	Site Selection	100.00	00.00	100.00	00.00	00.00	100.00
2	Planning and Decision about what to Plant	61.25	38.75	100.00	00.00	60.00	40.00
3	Organising Planting Operation	92.50	7.50	90.00	10.00	46.66	53.33
4	Managing Plantation	97.50	32.50	100.00	00.00	00.00	100.00
5	Distributing the Produce after Harvesting	70.00	30.00	100.00	00.00	00.00	100.00
6	Marketing	62.50	37.50	100.00	00.00	00.00	100.00
		Operational Tasks (Participants' Views) (%)					
1	Nursery Raising	100.00	00.00	100.00	00.00	6.66	93.33
2	Land Protection	00.00	100.00	100.00	00.00	00.00	100.00
3	Watering	15.00	100.00	75.00	25.00	6.66	93.33
4	Weeding	90.00	10.00	55.00	45.00	6.00	93.33
5	Fertilising	100.00	00.00	90.00	10.00	33.33	66.66
6	Crop Protection	75.00	25.00	25.00	75.00	00.00	100.00
7	Extraction	30.00	70.00	75.00	25.00	00.00	100.00
		Participatory Benefit and Assessment (Participants' Views) (%)					
1	Benefit Sharing	100.00	00.00	50.00	50.00	00.00	100.00
2	Monitoring & Evaluation	100.00	00.00	60.00	40.00	23.33	76.66

Monitoring and Evaluation

Monitoring and Evaluation (M&E) was the responsibility of the participating agencies in all projects studied, with the responsibilities solely vested to project personnel. Participants had hardly any voice about the appraisal about project activities. During questioning,

participants repeatedly commented that M&E was the work of the project officer and that they do not know anything about it.

Local FD and CHTDB officials kept some documents recording M&E, but they were not well maintained. On the other hand, NGO personnel were found to have well-maintained M&E records, with huge volumes of writings and recordings. However, during field study, our observations and participant' comments inferred that NGOs placed more emphasis on writing than of working in the field. Based on the above facts, it may be acknowledged that both GO and NGO PF agencies kept the prevalence indicator 'Monitoring and Evaluation' as their sole responsibility.

Benefit Sharing

The sharing of project benefits by participants and the participating agencies was the most attractive feature of PF interventions studied. In FD cases, a percentage of the benefits which arose from farming practices on project lands were given to the participants. For instance, in the plantation raised in the areas near settlements, FD started by allotting a 2.5 percent share of the final harvest to the participants. This share increased in subsequent projects, to the point where participants in FD Forestry Sector Project will receive 30 percent of final harvest. Land tenure was provided in FD village Longodu the other three villages received leased deeds, with two of them now in the process of obtaining tenure rights (the last village, Babupara, is in a reserved forest and the participants were primarily forest villagers). Decisions about the amount of benefits that would be shared were kept as the sole authority of the FD and declared in the project documents. The respective participants were not consulted by FD or allowed to participate in decision making before the commencement of the projects. Views in this regard from both the PF agency and respective participants, counted as percentages, as shown in Tables 5.5.1 and 5.5.2, also confirm this.

In CHTDB projects, benefit sharing was established for rubber latex production. In the remaining land provided by CHTDB PF agencies, participants were encouraged to practice farming with full benefits allocated to them. Land tenure was provided for residents of the older CHTDB village Gasbow. Participants of the second village studied were yet to receive lease deeds, in response to which they expressed anger during questionnaire surveys. Project personnel confirmed with CHTDB office records that lease deeds had in fact been finalised and would be handed over soon, and ultimately participants would be

provided with land tenure. However, similar to FD projects, decisions about benefit sharing were solely made by CHTDB and the respective participants were not consulted or allowed to participate in decision making before the commencement of the projects. CHTDB personnel and project participants' perspectives in relation to this are shown in Tables 5.5.1 and 5.5.2.

In the case of NGOs, all the benefits arising out of farming practices were for the participants. Participants were provided with similar kinds of incentives as those in GO projects, minus the land tenure aspects as they already possessed tenure rights, with an exception in Jabarang village. NGO participants were also provided with the composed fertiliser-making techniques and tools, and materials help as required. Both PF agencies and the respective participants opined that decision making for benefit sharing was done by the participants, but in reality NGO PF agencies' role in this regard was also countable.

PF Achievements

Economic Welfare, Social Upliftment and Good Governance form the key criteria for evaluating the achievements of PF projects studied (refer to 'Framework of the Study' in Chapter 4). These determining indicators were employed in assessing the impacts of PF on poverty reduction and participation. The achievements and performances of PF interventions in CHT in achieving economic and social welfare through poverty reduction and participation were explored in this study by employing these indicators and also incorporating other related issues and topics (see Chapter 4).

Economic welfare

i. Income, Employment and Associated Opportunities

GO participants, who were mainly involved in shifting cultivation, were found to be quite poor. NGOs selected participants in long-established villages and allotted *jhum* lands; the majority of them were also poor. Due to PF interventions, participants' main source of income is from farming. The other major source was income from wage labour, either in government plantations or nearby areas. Comparing the average annual income of PF project participants studied with their incomes before PF interventions revealed an overall more than trebling (3.69) of participants' income. This consisted of a doubling of income for NGO participants (2.43), quadrupling of income for FD participants (4.14) and a seven-scale increase in income for CHTDB participants (7.74), as shown in Table 5.3.2. Moreover, all three components of

Farm Income were found to be significant (see Tables 5.3.10 and 5.3.11). Likewise, the three sub-components under Forest Income were also found to be significant (see Tables 5.3.15 and 5.3.16). However, the low levels of Farm Income earned by the majority of participants mean that there is still the possibility of increasing earnings from farm practices. Agro-forestry income was commonly high in both GO and NGO cases.

In the field, it was observed that participants have an inherent wish to receive incentives from the projects in the form of grants. During our observational visits, interviews and questionnaires, participants expressed their wish to get more financial support from project agencies. This desire was present in the majority of participants, as lack of funds played a major role in restricting many of them from initiating more efforts to boost their incomes.

As from variation analysis, naturally there was significant component-wise as well as total income variation among beneficiary types. The component-wise farming income showed that the majority of FD, CHTDB and NGO participants could earn much more if they themselves make adequate efforts and the PF agencies take necessary steps to accelerate earning. Hence, it may be concluded that there are still opportunities to enhance PF participants' income and employment. This indicates that the PF practices in CHT studied contributed somewhat to the economic welfare of the participants.

The construction of houses, schools, religious institutions, water and sanitation facilities were carried out by the intervening agencies. Roads and communication networks were also found to be in existence, though not uniformly in all cases, and also not according to requirements that would facilitate the marketing of farm products or lead to enjoyment of community facilities, social wellbeing, education and entertainment. Though such facilities are provided to a considerable extent, there is ample scope to improve transport and communication infrastructure in the future. However, it is likely that with the increase of economic upliftment, such demands and requirements will also increase.

ii. *Environmental Sustainability*

All the GO and NGO participants, key informants and inhabitants from surrounding areas told us that there was once lush green vegetation throughout CHT. Particularly the older people confirmed this, claiming themselves as eye-witnesses, and also from what they heard from their parents and grandparents. Due to a gradual increase in population, plus

insurgency, illegal logging and trafficking of forest produce, the situation in CHT has gradually deteriorated, and as a result most USF lands have become barren. GO and NGO PF interventions in CHT attempted to revitalise such barren hills by planting forest and fruits species and permitting agricultural practices in combination with forestry, forming agro-forestry practices in the comparatively low hills and plain areas. As a result, such areas targeted by PF interventions now look visibly green.

PF practices in CHT tended to place more emphasis on forest management than watershed management. In reality, for appropriate environmental development, the hilly region should be approached with a combination of appropriate Forest and Watershed Management based on location, topography, soil and water. This places emphasis on selecting and identifying micro-watersheds that are managed for a sound environmental situation by involving local people. Consequently, although almost all the intervened areas of FD, CHTDB and NGO PF villages look visibly green, in view of the above watershed issues, PF environmental achievements may be considered partial.

Participants were asked about the environmental improvements achieved from PF intervention in CHT, categorizing the improvements as 'well,' 'moderate,' 'less,' and 'as before.' Their opinions are shown in Figure 5.4.1. Of the 58 study participants, 5, 22, 30, and 1, evaluated the environment as 'well improved,' 'moderately improved,' 'less improved,' and 'as before,' respectively, based on their general expectations. Thus, it can be inferred that the project area environment improved compared to the previous situation. However, most participants commented that the improvement was lower than their expectations. This was due to the fact that they consider the environment in a macro-state, taking the systems and the surroundings as a whole. Though the micro-environment of the PF villages improved, coverage of the total area under PF was very low. Thus, a majority of participants categorised it in the 'less improved' category.

Through this PF project evaluation process, the farmers are now more aware about the effects of deforestation on land and the natural resources of the locality. The participants who were earlier involved in illegal logging and trafficking of forest produce gave up such unsocial practices, though it was observed that some villagers have encroached on government land and continue to keep it in their possession (particularly seen in Kibukpara village of CHTDB).

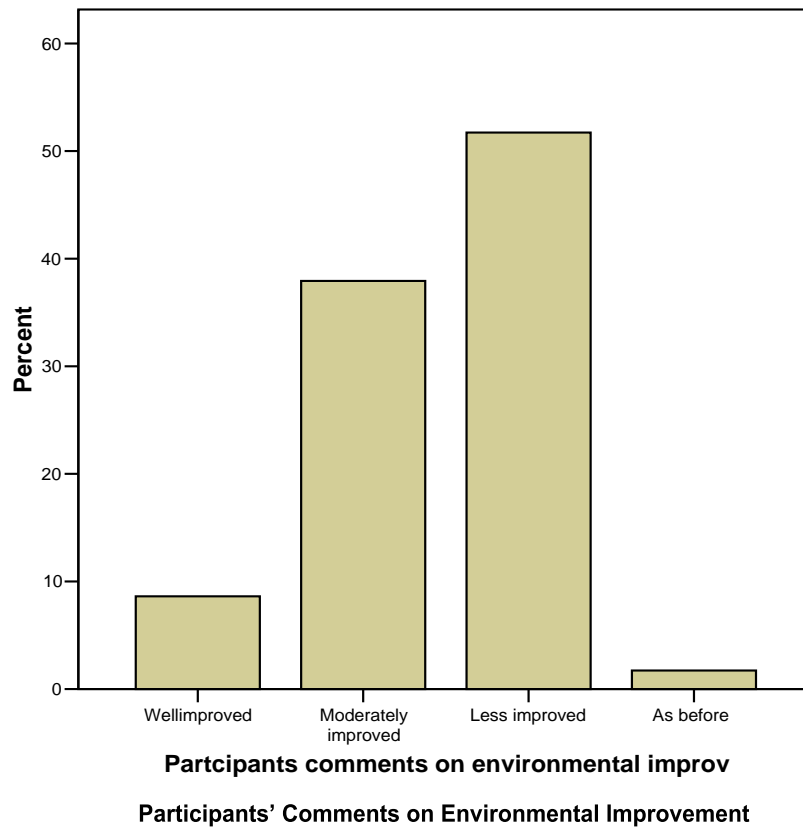


Figure 5.5.1: Participants' Comments Regarding Environmental Improvement

Figure 5.5.1 demonstrates that notable variations exist among the participants' comments about environmental improvement. This indicates the differences in awareness about the need for environmental improvement and sustainability in the locality for their better living conditions as well as total improvement in a developmental context.

The majority of participants commented that agro-forestry practices are the most acceptable cropping system in generating green space, reducing soil erosion and providing food for their livelihood. A few participants expressed that due to the shade from trees planted, their agri-production has reduced. They also opined that in such hilly lands, agro-forestry practices provide the most appropriate crop production system, but in steep slopes plantation of pure forest is desirable.

Infrastructure developments, particularly roads for commuting, have provided notable benefits to PF participants. However, on the other hand, illegal loggers also benefitted from commuting access to perform such unwanted activities in nearby government forests. This is particularly true in FD and CHTDB cases, as plantations were raised nearby PF villages. Observations showed that some of those plantations, where participants were involved as beneficiaries (under

benefit sharing agreements), have degraded as a result of illegal logging.

Social Development

i. Human Capital Development

GO and NGO interventions included training as a part of their development initiatives to make the participating farmers skilled in their farming work as well as supply them with related knowledge. In FD cases, participants of Alotila village received training for three days in 1994 on “Nursery Raising and Plantation Techniques”. Likewise, Babupara participants also received a three-day “Nursery Raising and Plantation Techniques” training. Longodu participants received training on “Nursery Raising and Plantation Techniques” for seven days in 1987-88 at the Forestry Development and Training Centre, Kaptai. In Banafulpara village, no training was arranged. Participants passed affirmative comments about the training. They also commented that their main attraction was the financial incentive (daily allowance), free t-shirt and umbrella that were provided by FD in connection with the trainings.

In case of CHTDB Kibukpara and Gasbow villages, participants received seven and ten days training respectively on plantation raising techniques, including rubber latex tapping. Training venues were in village localities in Khagrachari. Participants’ opinions were similar to those of FD.

In NGO cases, Dulochari participants received two days training on “Sustainable Management of Village Common Forests,” three days training on “Community Organizing and Strengthening,” 2 days training on “Organizational Aspects of Village Common Forests” and 1 day training on “Land Rights and Gender Equity of Village Common Forest Management in CHT,” during the period 2002-03. Additionally, Caritas provided a four-day training in 1998 on “Plantation Raising Techniques and Compost Fertiliser Preparation” in a local school. Jabarang also gave training to their participants on “Sustainable Cultivation in the Hills” and “Compost Fertiliser Preparation.” Participants’ comments about training were similar to the comments of FD and CHTDB participants.

All the participants opined that their awareness about Forestry and Agro-forestry increased substantially and the skills they developed through training played a vital role in enhancing their incomes through improved farming practices.

ii. *Social Capital and Inclusion*

In all PF interventions studied, participants' overall living conditions improved significantly. The expenses they incurred for education of their children, health, entertainment and festivals as well as their food intake significantly increased, exhibiting the improvement of their living conditions in the course of time. Participants were asked about any social upliftment they experienced due to PF intervention in CHT, categorising the improvements as 'well,' 'moderate,' 'less' and 'as before,' with their opinions are shown in Figure 5.6.2. Out of the 58 participants, 10, 35, 12, and 1 responded that their social condition was 'well improved,' 'moderately improved,' 'less improved' and 'as before' respectively, based on their general impressions about their social improvement. It can, therefore, be inferred that participants' social circumstances substantially improved through PF projects.

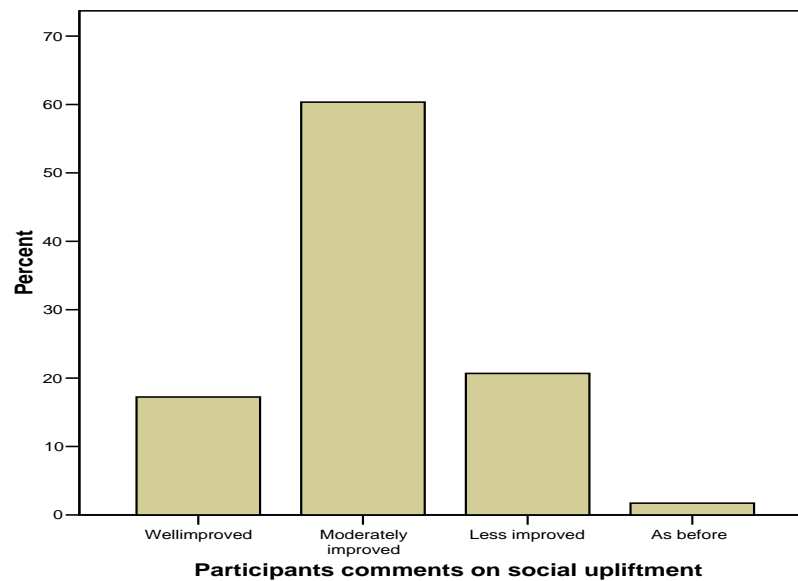


Figure 5.5.2: Participants' Comments Regarding Social Upliftment

Figure 5.5.2 shows that though variation exists among the participants' comments on social improvement, 98 percent of the participants felt a boost to their social situation due to PF interventions. This indicates notable social upliftment of PF participants studied. The overall findings confirmed an increasing trend in social spending of all GO and NGO participants due to PF interventions (see 'Social Expenditure' on pp.298-307).

FD and CHTDB participants received built houses during project periods and were found to be maintaining the quality of their homes. Even participants of older villages also maintained the same. In NGO cases, the status and quality of participants' houses improved. Though NGO participants previously cherished a sense of recognition and

esteem to some extent, they now feel that the same have highly increased via home improvements. GO participants, as they were mainly landless *jhumias* prior to PF intervention, did not possess such sense of recognition and esteem earlier, but they now proudly assert that change. This rise of their status was recognised by peers and people from other villages through participants' more frequent hosting of friends and relatives in their homes and their visit to the relatives' homes and outside villages. In addition, participants' improved social standing was confirmed via increased invitations to socio-cultural and religious events, the willingness of families from outside villages to establish marriage relationships with their families and as their access to public and private offices and other formal quarters became easier.

All the participants commented that they were selected either through a linkage to local forest staff, local *Union Parishad* leader, traditional leader, headman, or *karbari*. Thus, here patronage played a major part in PF participant selection.

In all the PF villages, one participant was nominated as village leader or *karbari*. The leader acted as the head of a local institution comprising all the PF participants of the village. The majority of opinions extracted from participants, as well as field observations, evidenced that the local leadership did not function properly as per participant requirements. Even worse, relatively poor participants sometimes fell under patronage of the *karbaries*. Other farmers were found to be maintaining regular contact with local *karbaries* in order to access and exploit advantages from the headmen. Some influences from the PF agency personnel may have fuelled this patronage effect, manifesting patronage relations and influences in the study areas.

Collectively, the PF village participants gained status as small groups of notable political power in voting in local government elections, and thus received increased attention from local political leadership.

In hills having a rocky layer, which rendered manual drilling almost impossible, tube-wells were non-existent. Therefore, participants depended upon surface water and small water reservoirs in valleys, relying on these unsafe water sources for drinking, cooking and other domestic uses. All participants demanded better arrangements for safe water sources, requesting tube wells, ring wells or any other water source based on their suitability in specific locations. Participants particularly emphasised the need for safe drinking water and improved sanitation. In most PF villages, schools and temples were in existence,

having been constructed by the PF agencies or out of the generosity of another NGO. In villages where such facilities were not yet provided, participants appealed for the same. For example, FD village Banafulpara requested two tube wells or ring wells, re-excavation of the existing pond, construction of a temple and a school for their children's education.

Good Governance

i. Participation and Involvement

All the GO and NGO farmers were involved in PF practices, which is an indication of their desire to participate in this regard. They participated in operational and management tasks, in accordance with the flexibility and limitations thereof (see Tables 5.5.1 and 5.5.2). Additionally, in all the forestry-related components of operational and management tasks, PF agencies controlled and regulated participation.

Therefore, overall participation was partial, and in some cases, such as site selection, decisions regarding benefit sharing, monitoring and evaluation, etc., participation was minimal. However, participation was visible in plantation raising and maintenance, agri-crop production and livestock rearing. It can be summarised that during project periods, farmers participated to execute the decisions imposed on them by PF agencies, with some item-wise flexibility in relation to specific tasks.

All participants responded to questionnaires by saying that they were fully involved in plantation raising activities. They also commented that they changed species composition according to their preferences, which were usually based on their eagerness for economically productive species. However, participants were somewhat aware about the environmental needs of location based, ecologically sustainable species. In meetings with project agency personnel, only a few well-off farmers spoke out, and the majority played a passive role, depending on the well-off farmers' advice and instructions. Therefore, viable interactions of farmers with PF agency personnel were mainly based on the voices of a few farmers, who did not represent the whole village. Hence, though the PF agencies started participation meetings with all the participants in the early stage of projects, they were progressively dominated by wealthier farmers.

Participants expressed their satisfaction about participation during the project period. However, they expressed their dissatisfaction that after the end of the project period, there was nobody to look out for them.

Women's participation in the formal meetings was minimal. However, to some extent they shared decision making with their husbands in the case of species selection, crop production, maintenance, harvesting of agri-crops and fruit, marketing and social decisions. Hence, the partial participation that was observed in PF villages was also male-dominated participation.

The physical goals for the projects were mostly achieved in respect to providing land for settlement, distribution of seedlings and other planting materials, plots for plantation and building of houses and other infrastructure. Farmers' investment in tree planting was negligible, except that they invested in the gradual conversion of land into forestry, agro-forestry and agriculture zones based upon their preference for profitable species. This particularly happened in the comparatively old GO projects of FD and CHTDB.

ii. *Observance of Contracts and Agreements*

GO PF agencies, FD and CHTDB, gave participants government land on which to settle. Among the four FD interventions studied, settlement under the Forestry Sector Project was in Reserved Forest and in the remaining three earlier projects in USF land. There was no scope for providing land tenure in the reserved forest and therefore, only tree and crop tenure agreements with the participants were signed and handed over to the participants. Settlement in the USF land provided scope to provide land tenure, and so many participants had already been provided with land tenure (two FD and one CHTDB village participants). However, providing land tenure rights took a long time, as repeated attempts were made to resolve bureaucratic and procedural limitations and complications, in addition to lack of inter-agency coordination, etc. Tree and crop tenure agreements that also provided land use rights were signed and handed over to all the FD PF participants. Participants of CHTDB village Kibukpara had not yet received their crop tenure agreements at the time of study. The participants expressed dissatisfaction due to delays in handover of these agreements. The Manager of CHTDB explained that it was late due to a procedural delay, but it is in process and will be handed over soon. Looking at the situation overall indicates government intention to provide land tenure to all participants except in the reserved forests.

In NGO cases, target participants with prior land tenure needed agreements for benefits, and in this regard, timely assistance was provided by NGO PF agencies. In Jabarang village, land was provided through the traditional method of allotting land for *jhuming*. Farmers

occupying such land for a long time need government policy-level decisions to be made about how the tenure aspect will be dealt with in the future.

iii. Administration, Technical Design, Extension Services & Bureaucracy

PF is quite different in theme and style compared to traditional forestry practices implemented by government forestry staff. It is also different in respect to the traditional *jhuming* practices of the CHT people. Therefore, PF agency staff who earlier got training in policing forestry methods needed appropriate training to orient themselves in line with the current extension approach to forestry. New recruits should also be properly trained with this in mind. For PF projects, traditionally trained foresters were engaged and therefore, they could not serve with full devotion as community developers. However, training of government foresters to adapt themselves into PF-oriented foresters has already begun via recent PF interventions in the country, including those in CHT.

NGO PF agencies engaged personnel as community forestry developers, but the numbers of staff allocated to PF projects, considering their diversified work in microcredit and other programmes, were found to be inadequate. Furthermore, NGO PF personnel were observed to be mostly preparing paperwork rather than spending time in the field. The majority of participants opined that the funds allotted for project activities were inadequate and should be increased. Moreover, government fund allocation and release procedure should be simplified to avoid delays that hamper timely execution of the scheduled work.

In every PF village studied, local institutions were arranged by PF agencies mostly on a nomination basis. Influential farmers were taken as members, and therefore, the nominated *karbari* of the village became the main and, in almost all the cases, lone focal point for maintaining day to day activities as well as addressing any other matters. Poor participants knew about the committees set up, but did not have a voice to communicate anything without the consent of the *karbari*. Hence, in reality, the desired meetings between farmers and PF agencies were in most cases the meeting of a few influential farmers with one or two concerned project staff. In this way, local institutional meetings were occasional and were actually the gathering and discussion of a few farmers only.

Occasionally, extension activities such as PF awareness programmes were conducted by the PF agencies. All PF agencies provided forestry-related training to participants. However, trainings were only delivered once for each village, for about three days on average. No further or refresher trainings were arranged. PF research activities were very insignificant and occasional. General evolutionary documentation in the form of reporting was observed, but in-depth studies were almost absent.

iv. Election of Leadership

Rather than leaders in PF villages being elected, it was predominantly a process of selection. Leadership selection in FD villages was done once during the inception of PF projects. Similarly, in CHTDB and NGO cases, selection was given preference, and voting for village committee formation was irregular and mainly influenced by the influential farmers in association with the desires of the PF agency staff.

Summary, Implications, and Clues on Improvement

Introduction

The present state of PF in Bangladesh is the achievement of a long line of successive efforts towards goal-oriented implementation of PF project interventions in the country. Both GO and NGO initiatives have played vital roles behind the success achieved so far. According to Huq and Alim (1995: 1), tree growing in rural areas started in 1970 in about 50 countries of the world, including Bangladesh. From mid-1970, the Bangladesh Forest Department initiated programmes for tree growing in rural areas and on degraded and marginal government lands, which gradually developed through several different projects, morphing into PF as we know it today. Similar to other countries in the South-East Asian region, in Bangladesh, PF has become the most important forestry strategy for minimising degradation in existing forests and encouraging sustainable development of forest resources. The method of involving people in tree planting, particularly rural people and those living in and around forests, has varied, depending on the systems, surroundings and associated factors in each locality.

Specifically, the approaches PF project agencies used to involve people in plain land areas and hilly areas of Bangladesh were found to be quite different. In the plain land areas, PF was generally practiced on roadsides, marginal lands, and degraded and encroached forest lands by providing tree tenure to the participants. In hilly areas, particularly in CHT, both land and tree tenure were provided to participants by allotting specific amounts of land for PF practices. The major causes for the different ways of involving people in PF in plain lands and hilly areas were due to land scarcity and the high population density in plains. On the other hand, in CHT, people were nomadic, and practiced *jhum* in the vast USF lands which created opportunities for formulating PF rehabilitation projects. Moreover, another sharp difference in PF practices in plain lands and hills was also discovered. In plain lands, though FD started PF projects carrying out all the activities as a whole, they gradually involved NGOs to share PF work by delegating specific tasks and responsibilities to NGOs. On the other hand, in CHT, GO agencies (FD and CHTDB) initiated PF programmes, but still today NGOs are not involved in GO PF

activities. Regardless, NGOs are carrying out PF programmes in CHT in separate initiatives by targeting long-established village people and people who were allotted *jhumlands* through the traditional way of allotting lands for *jhuming* by local headman, and who have been occupying the same lands for several years at a time. It is pertinent to mention here that nomadic *jhuming* practices were not identified in the low hill areas of CHT, particularly in the low hill-dwelling Chakma, Marma and Tripura communities. Observations showed that nomadic *jhuming* is still practiced by the high hill-dwelling communities of CHT, even in the high hill reserved forests where people access land by encroaching or other means. Until present, PF practices have only covered the low hill areas of CHT. High hill areas are yet to be involved. Out of the low hill dwellers, Chakma, Marma and Tripura communities were found to be the most involved, though Chakma community involvement was comparatively less. Again, in all the low hill areas, traditional *jhuming* practices were found to be almost absent. In lieu, a combination of traditional and improved *jhuming* practices, which may be called “improved *jhuming*,” were found to be practiced in almost all the low hill areas. Moreover, in all the GO and NGO PF villages, similar improved practices were found. It may be that the impact of improved farming practices in the PF villages is the result of the present improved *jhuming* that was found to have spread in the low hill dwelling areas. Our present study deals with these PF projects of FD and CHTDB, as well as NGO PF projects in CHT. Hence, the implications of the empirical findings of this research study are our main concern in this chapter and therefore are dealt with here. Accordingly, in line with the findings stated in chapter five, the functional and policy-level implications have been attempted to be noted and summarised, based on the overall findings of this research study. Finally, the key findings and associated recommendations for the continuity and advancement of PF practices in CHT have been presented.

General and Crosscutting Issues

Gender balance in participant selection

All the PF villages, irrespective of beneficiary category, were male dominated. This was because, in all the cases, husbands were selected as participants. Though a few female-headed households were found, each of the women actually became the head of their household after their husbands' death, with one exception where the husband was a disabled person. The established selection criteria was to select male family members as participants in all the GO and NGO PF villages in

CHT, particularly while selecting Chakma, Marma and Tripura participants. Again, Chakma, Marma, Tripura communities are male dominated, which may be an inherent reason for this strategy of selecting male participants only. In contrast, field observations and findings showed that female household members played vital roles in farming practices. It was also found that, in the majority of cases, in household decision-making, both husband and wife discuss the matter and make decisions together. However, in cases where couples failed to make joint decisions, the husband imposed his decision on his wife and that was treated as final. It is mentionable here that in recent plain land area PF programmes, considering the gender issue in PF participation and recognising the positive role of women's participation in PF practices, both husband and wife were taken as joint participants. It may be opined that the gender issue has not been given importance in PF programmes in CHT. Hence, it is necessary to decide whether the gender issue will be given prominence in formulating future PF projects for CHT people. In order to do so, adjustment of the PF practices and programmes in line with the indigenous traditions and culture of each community is needed. To find out the ways and means to incorporate the gender issue, there is a need for in-depth studies. This can be done by taking locality- and indigenous community-wide pilot projects alongside carrying out field research on this issue and related affairs as well as running awareness campaigns by providing training on gender issues and their role in farming development. This can be carried out via both public and private initiatives. Therefore, in formulating future PF projects and programmes for indigenous communities in CHT, whether the gender issue will be given preference and women participants will be selected or not is an important consideration, and may be incorporated into future policy guidelines and measures should be taken accordingly.

Community consideration in participant selection

Members of indigenous communities were found to be living in harmony in PF villages, indicating that participant selection was made irrespective of community consideration. However, in mixed-community PF villages, the presence of minority indigenous community members was found to be insignificant, with the majority of community members to some extent reflecting the population of the wider locality, along with the harmonious existence amongst indigenous communities. One exception was that the Chakmas were found to be less prevalent in PF villages, even in Rangamati district where their population is higher. As can be expected, the Marma

community member participants were found to be more in number in Bandarban, and Tripura community member participants more in Khagrachari. Chakmas, though having a higher population in Rangamati, were found to be participating in less number. Therefore, whether the present selection procedure will be continued or not may be a determining factor. If continued, the Chakma community participation may be considerably less compared to the other two communities. Additionally, the fact that areas with mixed community participation were found to be in harmony may be due to the presence of an insignificant number of members of one community within another community. Using the present selection procedure, there is a chance of selecting a significant number of participants from two or more communities in one particular village. If such a selection occurs in the future, whether the present harmony will continue or not may be a topic for investigation. The reasons for lower Chakma community participation should be explored. Selective community participation may be required to ensure more Chakma and/or other community participation. These factors raise many socio-culturally influenced labelling issues that should be addressed accordingly. There is a need for in-depth studies, mainly to find out ways and means of formulating a guideline for future PF practices in CHT. Particularly, in-depth studies may be required in selected identified areas. Therefore, policy level decisions to ensure harmony of mixed community based participation, by emphasizing locally-based proportionate community population as the basis for participant selection, may be adapted. However, future continuity of such policy decisions would depend on the findings of the above-mentioned related cognisable research studies.

Religious harmony

The participants were selected irrespective of religious consideration. Mixed community participation in villages encompassed mixed religious participation due to the fact that all the participants from the Chakma and Marma communities were Buddhists and those of the Tripura community were Hindus. Their existence was found to be in harmony, indicating inter-religious as well as inter-ethnic harmonious relationships. It may be noted that all the participants were found to have strong beliefs as enshrined in the respective ancient Hindu and Buddhist religions. No participants of the Christian faith were found among the Chakma, Marma and Tripura PF participants, which is an indication that they kept their respective beliefs so firmly that others failed to influence their beliefs, even though this hilly region

experienced more than one century of colonial rule. Hence, any activity that influences their beliefs should be strongly avoided. Therefore, inter-religious and inter-ethnic harmonious relationships as evidenced by this study should form an important basis for any future PF program in this region.

Participant age criteria

There was no specific criterion about the age of participants in all GO and NGO cases. However, workable proved to be a beneficial guide, although variation among the types of beneficiaries was evident in the field. This was due to some functional level relaxation implemented by the NGOs in selecting older farmers. This indicates that there was no fixed selection criterion about the age of participants at the functional level, yet all the participating agencies gave priority to selecting middle-aged farmers. Unfortunately, findings reveal that the majority of the participants did not put sufficient endeavour into farming practices, which resulted in comparatively lower levels of income generation. However, if a specific age was fixed in the selection criteria, obviously younger and more workable farmers would have the opportunity to be selected. To meet this need, a specific age class would have to be decided upon by mounting age-based farming studies to determine an optimum workable age range for farmers. However, this may have negative impacts also, as comparatively older farmers are generally found to be more experienced in cultivation and may hold the power to influence young people not to get involved in PF practices in the future. Therefore, whether this present system of participant selection will require any modification or not may be an issue for further study. If not, setting goals for comparatively more productive farming by selecting young farmers and counteracting any possible negative impacts should be determined at the policy level. Possible negative factors and their impacts as well as the appropriate remedial measures may be another avenue for further studies.

Family size

In regards to family size, most of the participants were found to be aware about the importance of keeping family size reasonably small. However, they also desired more children to be engaged in future farming as they believe that more children mean more labour and more opportunity to increase family income. Older farmers were found to be comparatively less educated, and less educated farmers were found to have small and medium sized families. Hence, raising social consciousness as a part of PF interventions through an awareness campaign may encourage family planning by participants. Currently,

the desire for more children to increase family income still exists. Hence, provisions for educating farmers and their children in general, as well as enhancing their capacity to search and adopt new avenues for income generation alongside appropriate farming, may be undertaken at the functional level. For this, formal and/or informal training and educational programmes for the farmers should be undertaken by establishing schools in or near villages for educating their children. Therefore, policy level decisions should be adapted to include adequate steps for spreading education amongst the villagers as an instrument for family planning. Further PF programmes will therefore have more of an awareness focus and would also establish linkages with service providers, particularly those active in the education sector and miscellaneous income generating and developing sectors.

Expanding PF practices in high hills

Observations during this study confirmed that PF initiatives covered mostly the low hill dwelling communities, as among the high hill dwellers only Mru and Bawm were found involved in PF practices, and in Bandarban only. The other high hill dwelling communities were not covered by any GO or NGO PF initiatives and most of them are still practicing traditional *jhuming* in high hills, thereby adversely affecting the natural forest, soil and water resources to a great extent. This study covered Chakma, Marma and Tripura communities who are mainly low hill dwelling people. However, involvement of other communities in the future, comprising both low and high hill dwellers, is a necessity for sustainable land-based resource management in this region. For this, the integration of Forest Management and Watershed Management is recommended, particularly for high hill areas. In order to assess to what extent and how precisely this can be adapted and executed, further studies and pilot-level implementations are needed. However, this is a complex and far-reaching issue and should be addressed accordingly. Therefore, further expansion of PF activities in this region should incorporate this important issue by involving local communities and considering local topographic factors and sound environmental land management by placing emphasis on micro-watershed management issues, suitably combined with appropriate socio-cultural and livelihood strategies.

Land Tenure

Land Tenure is an important aspect of any PF program as forestry practices are long-term due to the long gestation period of trees. In CHT, PF programmes have been implemented on both government and

private lands. Government agencies implemented programmatic interventions with the objective of settling nomadic *jhumia* farmers on USF lands, and very recently on degraded reserved forests also. Meanwhile, NGOs were found to be implementing PF programmes in already long-established villages with one exception. One NGO (Jabarang) was found to be taking participants who were those farmers that had been allowed to practice *jhuming* on Government lands by the respective headman of the locality. These lands were given for *jhuming* as a part of an ongoing traditional system which is a long time practice in this hilly region. The objective of the NGO Jabarang was to involve those *jhumias* in continuous farming practices in the same lands through PF interventions. Thus, both government and private lands were found in use for PF in CHT, obviously covering respective leaseholds or private property land tenure accordingly. Government agencies provided users with rights to lands by giving settlements for residing and carrying out farming practices as an initial pathway to provide land tenure to the participants, where possible. Providing land tenure needed involvement of other agencies, particularly the Revenue Department and coordinating service providing agencies. Government intention to provide land tenure to the participants of successful PF villages was already proved by providing leasehold land tenure to the two FD villages and one CHTDB village as well and that of others that are in process. In a notable contrast, after receiving leasehold land tenure from the revenue department, the FD Alotila PF village farmed giving importance to the forestry component, while FD Longodu PF village farmed giving high priority to agriculture, thus gradually converting forest lands into agricultural lands. Moreover, in NGO PF villages, where private land holders are participants, farmers were found to be more interested in agriculture than forestry. In another case, participants in Kibukpara CHTDB PF village expressed dissatisfaction due to the delay in signing and handover of land user right agreement deeds to participants, which in turn ultimately delayed the possibility of them obtaining land tenure from the Revenue Department. As forestry should be given proper importance by adopting it as a non negotiable determinant in PF practices, appropriate locality-based, in-depth studies may be needed for decision-making to provide land tenure to the respective locality. In order to process and finalize the demandable and possible cases in time, NGOs can play a vital role in communicating with the related departments, including the Forest and Revenue Departments, as well as by providing advocacy services. Therefore, amicable or situation-based settlement of land tenure should be included in future policy initiatives. As many

government departments are involved in settling land tenure, it is a necessary to provide timely logistic, administrative, advocacy help and services to the participants of PF programmes.

GO and NGO linkages

Unlike in plain land PF practices, in CHT, GOs and NGOs are involved in completely separate and independent initiatives. In the plains, GO and NGO linkages, denoting specific work and responsibilities (group formation, social mobilization, stakeholder empowerment, awareness campaigns, etc.) may be regarded as successful attempts in successive project interventions (Thana Afforestation and Nursery Development Project, Coastal Green Belt Project, Forestry Sector Project, etc.). The establishment of such types of GO and NGO linkages in GO PF practices in CHT may enhance the activities of PF programmes and increase the intensity of participation to accelerate success in the future. This is suggested because of the lower level participation by both the GOs and NGOs within the said existing system (see the section on participation in Chapter 5). Besides, GO agencies may start PF practices in rural CHT areas, targeting private land holders and also establishing suitable mechanisms to link with NGOs. GO and NGO joint participation in PF practices in CHT may be a strong tool for future PF development in CHT. These issues involve many related themes such as land holdings, leasehold and private property land tenure aspects and related rights and privileges of land holders, traditional ways and customs of CHT people, community-based ethnic patronage effects in establishing such linkages, and acceptability by the local and regional institutional leaders. These topics may be elaborated and so can be included in further studies. This will help in establishing locality-based, appropriate linkages and in identifying indicators for ensuring effective participation. Therefore, the establishment of GO and NGO linkages by involving NGOs in social mobilisation activities is necessary in order to enhance participation for achieving greater success in PF programmes and this may be an important policy initiative in the future.

Inter-sectoral coordination

Studies revealed that coordination among GO and NGOs in PF practices was almost absent. All the agencies were found to be doing their own activities independently. Even necessary communication and coordination among the FD, CHTDB and other related GO agencies such as the Revenue Department; Agriculture, Livestock and Fisheries

Department, and soil and water conserving bodies were found to be inadequate.

Land-based development interventions would by necessity involve many agencies; therefore, strong linkages and inter-sector coordination are a must for both GO and NGO agencies.

Economic Upliftment

Income of the respondents

The average annual income of FD, CHTDB and NGO participants was found to be high, compared to their income before their involvement in PF practices. This income was generated from farming practices that include forestry, agro-forestry, agricultural practices and livestock rearing as well as off farm activities, mainly wage labour. This increased income generation showed similarity as well as variation among the participants in each village, which ultimately exhibited the componential similarity and variation among the types of beneficiaries. This indicates that participants did not place similar endeavour in generating their respective incomes. Again, beneficiary types' income levels showed that the majority of the participants obtained lower to middle level income. The higher level income gained by some participants demonstrated the possibility of higher levels of income generation. In order to shed light on this issue and find out the factors that caused comparatively lower income generation by the majority of PF participants in CHT, though possibilities of greater income generation exist, further study is necessary.

Farmers' total income comprises both farm income and off-farm income. Farm income was the major contributor to the total income. Therefore, for the sake of the economic well-being of the participants, farming practices providing and nourishing favourable factors that help to generate high levels of income to all participants should be incorporated, and measures should be taken accordingly. However, off-farm income generating sources should be developed and new sources should be explored through different income generating service providing agencies. If required, coordination between and/or among the service providing agencies may be established and developed.

Land and farming intensity

Intensive farming practice provides proportionate income. The intensity farming and adaption of suitable farming practices is an important factor that explains farming income and hence total income. In PF practice in CHT, the farming intensity found varied, which is

why the total farm income and component-wise income also varied. Income earned from the forestry component showed variation between CHTDB and NGO participants. The FD PF forestry farming component showed similarity with that of NGOs, but varied with that of CHTDB. Meanwhile, the FD PF agriculture farming component showed similarity with CHTDB, but variation with NGOs. In the case of livestock income, no variation was found among the beneficiaries. Thus, similarity as well as variation was found among the income components amongst beneficiary types, indicating similarity and variation in intensity of componential farming practices. This reflects the need to help and guide those participants that are using comparatively less intensive farming practices. For this, participant-wise needs as well as PF objectives and goal-oriented determination of componential priorities should be undertaken for future guidance and promotional activities.

Moreover, participants' average annual income increased significantly as compared to their income before PF interventions. This increased income was also found to vary according to beneficiary type. GO participants' income increased more than double that of NGO participants. FD and CHTDB targeted comparatively much poorer participants than NGOs. Amongst NGO participants, the comparatively poorer participants obtained a greater increase in farm income. Hence, it may be opined that poor farmers were found to be placing greater endeavour in farming practices that resulted in more intensive farming practices and thereby generated higher incomes. Therefore, these findings as established by this study, can be a basis for future PF practices in identifying and targeting those participants who may need help, guidance, supervision and control for future PF income generation through improved farming production.

Relationship characteristics between lands and total income did not show a proportionate significant increasing trend of income with the increase of land holdings, while that between farm income and total income showed significant proportionate increasing trends. This indicates that it was the intensity of farming practices, and not the lands, which was the main contributor to the total income of participants. This finding established the fact that the intensity of farming practices played a major role in income generation. Consequently, in formulating future PF project programmes, this finding will provide a basis for determining how much land should be allotted to each participant in order to achieve intensive farming as well as assist more participants in situations of land scarcity that may

happen in localities where interested PF participants are more in number. Intensification of farming practices will need to incorporate training, inputs, incentives, as well as proper guidance, supervision and technical help. Lands that are not currently under optimum farming practices should be brought under suitable farming by using surplus family labour and other suitable inputs.

Farming income

The contribution of farm income to the total income of participants was actually the contribution of the incomes derived from different components (Forestry, Agro-forestry, Agriculture, and Livestock). Incomes of all the farming components were found to be significantly contributing to the total farm income. This indicated that land-based income played a very significant role. Again, the majority of farming component-wise income was found at lower levels for all types of beneficiaries. Higher level incomes generated by some participants indicated the possibilities of higher level income generation in all the components if appropriate inputs are provided in a timely manner. This confirmed the necessity to study how to involve all participants in higher income generating farming practices. There is a need to carry out studies to understand the participants' farming and livelihood needs, as well as related social factors and possible remedial measures. Therefore, in formulating future PF projects, the present system of giving importance to all the components of farming practices should be continued with appropriate initiatives to involve all the participants to earn higher levels of income. Farmers need to adapt improved agronomy and other management practices. GO and NGOs can help build farmers' capacity through training and demonstration sessions to be organized locally by mobilising capable resource persons.

Forestry income

Forestry income was found to be significant among all types of beneficiaries. However, variations were evident among the three types of beneficiaries, when categorised by tree component income, which influenced variations in total forest income. FD PF tree component showed similarity with NGOs, but variation with CHTDB. FD PF fruit and bamboo components showed no variation with CHTDB or NGOs. In fact, the bamboo component was found so insignificant that it could not be recognised under the variation aspect. Tree income varied significantly and thereby caused significant variation in total forest income based on the farming practices. Our findings show that it was

the high income generating rubber trees in CHTDB villages that caused the variation. This is an indication of the importance of appropriate species selection for goal-oriented income generation. Though quick income generating species will not be suitable in all locations, most of the participants seek immediate returns. However, though many timber-producing species that have long gestation period can provide a large income at one time, due to day to day needs, poor farmers wish to plant fruit trees and other short time span income generating species. These species may not be suitable for all places depending on land configuration. Moreover, villagers can benefit from intermittent tree harvesting in order to meet their expenses including emergency needs for marriage and illness. Therefore, only economic and short time span income generating species are not a good solution. Yet, participants were found to be very fond of economic trees whose market values are high, such as teak, gamar and many fruit trees. All GO and NGO PF agencies permitted the planting of economic trees considering the wishes of the participants. The planting of trees based on ecological considerations was almost absent in all PF villages. However, in hilly areas like CHT, it is a necessity to plant species based on ecological considerations for erosion control as well as overall ecosystem environment improvement.

Therefore, as a non-negotiable determinant in PF practices, and considering the importance of soil and water conservation in such hilly areas as in CHT, forestry practices or tree growing must be continued with appropriate emphasis given to tree species. Locality-based, site specific mixed species tree planting models comprising ecological and economic short, medium and long time harvestable species as well as fruit species that adapt well with agro-species should be developed. For this, in-depth technical studies considering ecology, soils, local conditions, terrain, as well as human requirements and related socio-economic dimensional studies should be undertaken. Awareness generation and adaptive campaigns, training as well as implementing functional necessities should be addressed accordingly. In such cases, a basket of possible species that are found ecologically suitable in CHT can be prepared. Local consultations will then be held with participants who will make choices among the species that are included in the basket and will be placed in the models. As such, flexibility should be accommodated in the models.

Income from bamboo

Among the three components of forestry income, the trees and fruit income was found to be highly significant, but the income from

bamboo was found to be comparatively very low. This is because bamboo cultivation was so small in amount that it could not generate substantial income. However, bamboo is actually a short time span income generating minor forest product. Moreover, bamboo cultivation is easy and this hilly region can suitably support bamboo cultivation. In some areas it may not be possible to grow bamboo on a separate land, but small scale sporadic bamboo planting in and around homesteads can be employed for bamboo production. Moreover, improved technology of bamboo cultivation covering small lands areas has already been developed. Hence, awareness generation about bamboo propagation, capacity building for improved nursery practices, clump management and bamboo processing should be included in future programmes.

Agriculture and Livestock income

Income from agriculture and livestock were also found to be significantly contributing to the total farm income. Income-based analysis inferred that there is scope for increasing income from these two components, if the participants could place appropriate endeavour in intensifying these practices. In the present system of PF practices, there was no direct involvement of the Agriculture, Livestock or Fisheries Departments. These departments can be engaged in an integrated form to help and guide the participants in related capacity building as well as goods and services providing agencies.

Farming components

Farmers' livelihood needs demand adequate production from all the farming components. PF practices should obviously continue tree growing, but reasonable emphasis should also be given to other components. PF practices in CHT, have given importance to all components and it has resulted in significant income contribution from all the components. Hence, PF practices played a vital role in generating land-based income. Therefore, future land-based interventions should provide adequate resources by giving emphasis to all of the components.

Off-farm incom

Besides farming income, participants tried to earn from other sources, including working as wage labour in the nearby *jhuming* fields, small timber business, temporary services, and rickshaw pulling. But only 7 persons out of 58 were engaged in such activities and this indicated that participants were in search of other income sources along with their farm income generating practices. But most of them did not find other sources except labouring in neighbouring *jhum* lands. Therefore, off-farm income generating opportunities should be created by carrying

out alternative income generating activities by mobilizing both GO and NGO resources.

Expenditures of the Respondents

All the GO and NGO PF participants were found to be incurring various expenditures that included farming expenses as well as many social expenditures such as expenses for education, health, clothes, entertainment, festivals, etc., along with their livelihood expenses. The source of income for such expenses was mainly farming. Participants' off-farm income was also found to make an added contribution to these expenses. It is mentionable here that before the emergence of the PF projects, FD and CHTDB participants' main earning source was working as wage labour and therefore, with this small income they were struggling to support their livelihood. At that time, the farming expenses and social expenses may be counted as negligible. Then, NGO participants were practicing farming and covering social expenses on a small scale that has now increased a significant amount due to PF project interventions.

Participants' average annual incomes were found to significantly contribute to the total expenses that included the various abovementioned expenses. In this study, expenses were grouped as farming expenditure, food expenditure and social expenditure. Farm income was found to significantly contribute to all the expenditure components. From this, it may be opined that, on average, the farming income of the participants was found in to make a significant contribution to all the three components of expenditures that ultimately contributed to the increased total expenditure of the participants. The off-farm income added contributions to those same already significant componential expenses. Although, counted on a beneficiary type basis, expenditure levels of all the three components showed that the majority participants from FD, CHTDB and NGO PF villages incurred lower levels of expenditure. However, an incurrence of higher levels of expenses by some participants indicated the possibilities of that for other participants also. It was found that comparatively higher levels of expenses were incurred by those participants whose incomes were comparatively more. Both the expenditure and income pattern showed that those who incurred more expenses in farming earned proportionately more income. Hence, this is an indication of the necessity to adapt appropriate measures to enhance the income of the participants whose incomes were comparatively low, so that they will

be able to incur more expenses for generating more income that will be a source of more expenditure for better livelihood, and to enhance better social contacts along with better farming practices.

Again, both similarity and variation were evident among the FD, CHTDB and NGO PF beneficiaries. Moreover, those who earned more were found to incur more expenses. Participants incurred the above-mentioned componential expenses with more or less similar intensity depending on their respective incomes. This indicates that they were aware about the needs of incurring expenses in diversity for better livelihood and for that they need more income generation. Though farm incomes of the participants were found to be main contributors to the various expenses, there was no demonstrated initiative taken by PF agencies for proper marketing of farm products. Therefore, better quality inputs in proper quantities are needed for enhancing farm outputs that can be sold at proper prices, with improved post harvesting practices and proper marketing. This may require strengthening both backward and forward linkages to the farm production system. Off-farm income generation opportunities may be categorised as complementary and supplementary activities.

Farm Expenditure

Collective expenditure for forestry, agriculture and livestock practices form the farm expenditure found in FD, CHTDB and NGO PF villages in CHT. In forestry practices, a major portion of the farmers' expenditure was fruit production. All the three components of farming practices were found in significant proportion to the total farm expenditure. Priority given to fruit species, agriculture and livestock rearing is an indication of participants' inherent wish to earn money in a short span of time. This indicated the need of awareness generation for environmental contribution of forest species that also can contribute a large amount of income at a time after tree maturity period. Again, characteristics of each farming component according to the type of beneficiaries showed significant variation in agriculture expenditure of NGO participants with that of FD and CHTDB. Variation patterns showed that NGO participants were found to be comparatively more interested in agriculture than that of forestry. Regardless, no significant variation was found between forestry and livestock expenses. It may be that the short time span income generating wishes of the participants had been comparatively more exposed by the NGO participants as they had land tenure security and rights in the form of private property land tenure. Though similarity and variation was seen among the types of PF beneficiaries, there was a common phenomenon in that the majority

of the participants in all categories incurred lower levels of expenses in all the components of farming practices indicating a need to initiate measures for increasing the financial capacity of the farmers concerned so that they can incur more costs for increased income generation. Relationship characteristics among the three farming components indicated a tendency towards forestry, more often in the form of agro-forestry, of CHT people, along with the production of general food items as needed for their livelihood. Therefore, measures should be taken to address low level investments in farming components. Low level investments in forestry practices, including plantations of commercial tree species and bamboo need to be addressed by removing land tenure insecurity by assigning government lands such as forest lands and other *khas* lands, but also providing forest finance by mobilising resources from government sources and other microfinance institutions. On the basis of suitability, this may take the form of public-private partnerships, if the situation demands. This may be an avenue for further studies and may be included in further policy initiatives.

Forestry expenditure

Inclination towards forestry practices by CHT people has been reflected in PF villages. As a non-negotiable determinant in PF practices, participants incurred expenses for trees, fruits and bamboo production, which form the forestry componential expenditure. Relationship characteristics showed that among the three components, fruit expenditure was found to be the most significant, while that of the other two (tree and bamboo) was found to be insignificant. This indicated that participants incurred forestry expenditure mainly for fruit trees, placing comparatively less emphasis on timber trees and bamboos. Again, individual expenditure levels for trees, fruits and bamboos showed lower levels, indicating the need of awareness campaigns and capacity building activities for componential basis forestry need based expenditure incurrence in tree growing and maintenance. Moreover, GO participants were found slightly more interested in fruit trees than NGO participants, and bamboo cultivation did not form a common practice. Appropriate steps to address bamboo plantation are required.

Again, the relationship characteristics also confirm the inherent preference of the participants for short time span income generating species, as indicated by the greater emphasis on fruits, lower emphasis on trees and negligible emphasis on bamboo. However, the majority of participants did not know about the importance of bamboo as a short

time span income generating species. It is also relevant to mention here that timber tree species require less expenditure for maintenance and, therefore, low expenditure incurred for forest trees cannot be taken as a generalised view, thus ignoring the forestry loving tendency of the CHT people. It was inferred that although forest land use was found prominent, major investment activities were devoted to the planting of fruit-bearing species. This trend can be capitalised upon by including fruit trees that yield timber as well (e.g. *Artocarpus*). Storage and processing of fruits locally would help add value to farmers' incomes and local employment in fruit processing activities. Bamboo value chain activities including improving nursery practices (e.g. *clum* cutting), improved *clum* management and bamboo product development and marketing can be initiated both by GO and NGOs.

Social expenditure

Social upliftment of the participants was noted by its componential (Education, Health, Clothes, Entertainment and Festival) expenses. It was found that all the componential expenses were significant in relation to the total social expenditure, indicating that all the social components were given due consideration by the participants. This is an indication of social awareness building and development among the participants, and an achievement of PF intervention. Statistical analysis of social expenditure in the three categories (FD, CHTDB, and NGO) shows that there are no significant variations where education and health are concerned. The main reason for this interesting finding relates to the farmers' increased emphasis on basic needs facilities provided to their children for good health and education. However, variations in the social expenses of uniform, entertainment and festivals is explained based on the fact that poor farmers are not able to meet those non-basic needs, as most of their income is already spent on meeting health and education related expenditure.

Any future development project should, therefore, have provisions for improved facilities for health and education as a part of the project package.

Participation

In all the three categories (FD, CHTDB, and NGO) of intervention, the word participation was found anchored firmly with an umbrella-like covering the overall activities as well. However, in reality, what was found was a form of partial participation. Yet, the trend of such participation is found to be generally progressive in nature in PF interventions implemented over the course of time. This view is based

on the collective comments of the overall findings and observations channelled through the following opportunity and prevalence indicators.

Decentralization

All the FD, CHTDB and NGO PF projects were mainly based on a top-down approach. Major decisions were imposed from the top, and at the functional level, some implementing decisions were discussed with the participants. However, it was not such that PF projects may be counted as decentralized. There was a visible trend towards decentralization, particularly as the functional decisions were seen to be gradually anchoring in the course of time, but still not at an overall satisfactory level. Decision-making requires a combination of knowledge and empowerment of the decision makers so that the possibility of making wrong or inappropriate decisions is minimised. Therefore, adequate devolution of decision-making power to proper project stakeholders and implementers is needed for effective and efficient implementation. This may require capacity building and empowerment by employing relevant processes and systems that will enable not only proper decisions, but also their implementation for achieving planned outputs and results. Further studies can be undertaken in this regard.

Linkages

All the PF villages were found to be situated near to the respective PF agencies' local office. Yet, linkages established between the participants and the participating agencies were found to be irregular. Though irregular, links were comparatively more frequent during the project period, but after the end of the project, the linkages became occasional. Hence, flows of information between the farmers and the PF agency personnel, even between the project personnel of local offices and the central offices, were found to be irregular also. Therefore, appropriate linkages between participating agencies and participants should be established. This may require studying existing mechanisms for communication and further improving the same by putting in place processes and systems that will enable both verbal and non-verbal forms of communication, thereby facilitating achievement of project objectives.

Flexibility

All GO and NGO PF projects were found to be centrally designed. However, partial flexibility was provided in regards to some implementing items. In comparison, NGO PF projects provided more flexibility than those of GOs. Amongst the GOs, FD provided more

flexibility than CHTDB. In all cases, the flexibility provided was found to be mainly in relation to agriculture inputs, implementing stages for cultivation, harvesting and marketing. To provide appropriate flexibility for a PF project, bottom-up planning and decision-making in consultation with local stakeholders would enable participants the flexibility to adapt to the changing and complex field situation that characterises both the biophysical and socio-economic environment within which project participants and implementing agencies operate. Thus, within budget constraints and project guidelines as designed by management, local level plans should be developed through stakeholder consultation. This can be included in the project policy briefs.

Incentives

Incentives in the form of lands allotments, thatched houses, seeds, seedlings and cutting as farm inputs and temporary employment as wage labour, were provided to the farmers as a strategy to encourage them to settle and participate in PF projects. However, these incentives were mainly provided all at one time, with few exceptions. For the sake of keeping the interests of the participants in continuity, incentive providing should not be occasional, but should be continued, by carrying out need-based surveys on a regular basis. Economic incentives are necessary for sustaining the interests of project participants. Financial and institutional sustainability should therefore form an important part of any exit strategy.

Decision making

In designing PF projects, major decisions were taken by the PF agencies and imposed on the participants. Beneficiary targeting and the selection of sites were conducted according to the imposed top-down guidelines. Little flexibility was provided in regards to management tasks and, therefore, participatory decision-making was very partial. In operational tasks, similar technology to that developed by the FD was provided by the PF agencies. The mode of operation and management that differed in the agencies' interventions provided, to some extent, participatory decision making opportunities, but those were mainly concerning the operational tasks of silvicultural and agricultural activities. NGOs were found to have provided more participatory decision-making for such activities than GO agencies. However, participatory decision making is a must for PF projects for effective implementation and sustainable results that impact the wider local communities. Site and species selection should be made keeping in

view bio-physical suitability, and also the expressed preferences of project participants. Participatory access, protection and management of the assets created under the projects should be ensured. Equitable distribution of project benefits needs to be ensured by involving participants. Future PF programmes should be designed incorporating adequate provision for stakeholders' consultation in deciding required PF operational and management activities, and their execution at the functional level.

Developing and maintaining land-based resources, including trees, will require active participation of participants who may be encouraged to form local organizations and their capacity building should be provided as a key project activity, so that effective participatory decision-making can be ensured through stakeholders' active participation.

Monitoring and evaluation

Monitoring and Evaluation were found to be the sole responsibility of the PF agencies. Participation of the farmers in this respect was nil. Participants were even found to hold the view that it was not their job to be engaged in Monitoring and Evaluation. Therefore, participatory Monitoring and Evaluation mechanisms should be established and implemented, and mid-term corrections taken as and when needed.

Benefit sharing

In all the PF project interventions, benefit sharing was an attractive feature. Though, how much benefit would be provided was decided by the PF agencies and imposed on the participants. Although agreement deeds were provided they were also decided by the PF agencies concerned. Appropriate farmer participation requires consultation and agreement on decisions between the participants and PF agencies. Therefore, participatory benefit sharing agreements should be introduced. For this, generation and distribution of benefits should be transparent and accountable, for which a committee comprising participants should be formed and participatory benefit sharing agreements signed and implemented. Initial negotiations can be held with the participants for fixing and distributing benefits.

PF Achievements

PF projects in CHT were found to almost achieve their set objectives as assessed physically and qualitatively, taking into account the objectives of settled farming, greening the denuded hills, participants economic and social upliftment, etc. However, in-depth quantitative studies, particularly the PF components and upliftment-level basis

studies showed that there existed ample potential to achieve much more than what was achieved so far in relation to economic welfare, social upliftment and good governance, which ultimately impact on poverty reduction and participation in PF projects.

Economic Welfare

Participants' income was found to have increased manifold as compared to their previous income before the inception of the PF projects. Beneficiary type-based average annual income increase showed that comparatively poorer farmers tried more to uplift their economic conditions. Proper species selection, appropriate inputs, etc. also played vital role in income generation. Moreover, farming income was the main source of economic gain of the farmers. Therefore, knowledge-based improved farming should be enhanced for future PF practices and that should be supported with required assistance from the agency side in manifested forms and facilities.

Participants got opportunities to work in the PF agencies' plantation-raising work as wage labour, which provided them with temporary employment. Moreover, they themselves got the opportunity to work on their allotted lands. These activities generated working facilities to produce and sell inputs and outputs, thereby providing and generating employment or work opportunities in producing, collecting, storing and marketing of such products. Some people in and around PF villages also got the chance to work in such activities as a result of employment and associated opportunities generated by PF interventions in CHT. Further spread and development of PF practices in the future would obviously increase such benefits to a considerable extent.

The lands where PF practices were introduced were previously almost denuded. That these areas now look green is an indication of environmental improvement to a notable extent. The overall PF processes placed priority on Forest Management, though this hilly and undulating topographical region requires more emphatic Watershed Management as a basis for environmental development activities. This can be achieved by incorporating Forest Management and Watershed Management with appropriate technological- and management-based intervening methods and tools in PF. Moreover, the portion of CHT covered by PF projects so far is a very negligible as compared to the total area. Therefore, within PF villages, environmental sustainability may be counted as partial and, compared to the whole area of CHT, it is very partial. Thus, it is recommended that PF practices should introduce appropriate Participatory Watershed Management practices

in combination with appropriate knowledge based agro-forestry farming practices.

Social upliftment

All GO and NGO PF interventions in CHT impacted the participants' social development through individual as well as collective human capital development, social capital building and inclusion. All the participants received related training provided by the respective PF agencies, which contributed to developing the participants' skills in farming practices. The results of increased participant skills include awareness building and greater potential for income generation that ultimately help and inspire social capital building and inclusion. GO participants, as they were previously landless, did not have much sense of recognition and esteem which they now feel, and though the NGO participants sensed it earlier, this feeling has increased with their participation in PF. PF projects provided participants with increased status and recognition by providing them with land holding status and increased income, which provided the indirect benefits of social credibility and recognition.

Participants are now aware about wellbeing and healthy living needs. They are spending significant amount of their income to educate their children and for medical care. They are forming marriage relationships with their surrounding neighbours, and even with comparatively well-to-do people living outside the PF villages. Their visits to relatives' houses and relatives' visits to their homes increased markedly. They established linkages with the local leaders, achieved voting power, etc. During our field study, they demanded improved sanitation, better water facilities, schools for their children, improved medical care, etc., which is an indication of their awareness about social capital building and inclusion. Still, participants should receive guidance in line with their social improvement, due to weak local institutional set up and patronage effects. Comparatively poor participants generally fall under the influence of patronage effects by influential participants and leaders of the surrounding locality. Moreover, for collective social gain, PF perpetuity and to provide momentum as and when required, the indirect benefits of PF practices related to social improvement should be identified and evaluated, along with their systems and surrounding impacts, to guide future PF project formulation and spread PF activities in CHT.

Good governance

All the FD, CHTDB and NGO participants were involved in participation. Yet, for almost all the management tasks, decision

making was done with almost negligible flexibility to incorporate participants. However, comparatively more participatory flexibility was provided in regards to operational tasks. Decision making for how to maintain linkages between the PF agencies and participants, amongst the participants, incentives provided to the participants, benefit sharing, and training-related decisions were also carried out with minimal participation. Moreover, site selection, monitoring and evaluation were done by PF agencies in GO cases, and with partial discussion with participants in NGO cases. Hence, in all GO and NGO cases, participation was partial and a top-down approach was found to be dominant overall, with minor exceptions in species selection, agri-crop production and their maintenance, harvesting and marketing. In formulating future PF projects, bottom-up approaches should be incorporated and needs-based provision for incentives as well as adequate funding provisions should be supplied. Participatory indicators should be studied along with their impacts whilst considering the systems and surroundings as a whole.

Government intention to provide land tenure is a positive step towards participation. To this end, inter-departmental coordination should be enhanced to provide timely notification and agreement handover, etc. The intensity of training should be increased and, instead of two or three days of short field training once in a project period, provision can be made for refresher training for the participants, repeated at reasonable intervals of time. PF agency personnel should also be provided with repeated training in order to orient themselves as a community forestry development agent. Local institutions should be made more workable, with regular meeting arrangements made mandatory and participation of all in the meeting should be encouraged by minimising patronage effects. For this, functional-level decision guidelines should be incorporated in future PF project formulation in CHT.

Summary and Conclusions

Due to regressive policies and management measures, the forests of the Chittagong Hill Tracts (CHT) in Bangladesh have been alarmingly degraded. The vast Unclassified State Forests (USF) have been almost completely denuded, resulting in land degradation and constrained livelihoods of the forest-dwelling ethnic communities. In order to combat the loss of forest and to reorient the trend of degradation towards progressive succession, Participatory Forestry (PF) emerged in Bangladesh during the 1980s.

Based on a thorough empirical work, this study has attempted to explore and document the PF practices, and the individual and comparative performances, variations and relationships among and between the intervening government and non-government agencies, and the targeted ethnic communities in CHT. The research encompasses such aspects as general demographic issues, livelihood patterns and challenges, participation, poverty reduction, and inclusion.

In CHT, PF practices were initially employed, and have been continued, in the form of *jhumia* farmer rehabilitation on USF land by the government organizations (GOs) the Forest Department (FD) and Chittagong Hill Tracts Development Board (CHTDB). Non-government organizations (NGOs) have also practiced PF in projects targeting marginal *jhumia* farmers from long-established villages and *jhum* land holders under the traditional system of land allocation in CHT. Though these GO and NGO PF agencies possess their own technologies and management measures, their goals were commonly those of forestry development through PF farming practices for economic and social upliftment of the farmers and environmental development.

Methodological pluralism was employed in this study by collecting and analysing both qualitative and quantitative data. This multi-method approach incorporated reconnaissance, sampling survey, focus group discussions using questionnaires, key informant interviews and empirical observations in the nine villages studied. Demographic, socio-economic, environmental and participatory data, as well as data on silvicultural and technological aspects, was collected as primary data. Secondary data was collected from journals, books, articles, monographs, souvenirs and official documents and reports.

Forestry, agro-forestry, agriculture and livestock rearing were the common land uses in all GO and NGO PF villages studied. Land tenure was provided to some PF villages and that for some others is under progress. In GO villages, lands allotted for horticulture and agriculture were converted to forestry and agro-forestry, reflecting the same as preferred land uses. Meanwhile, NGO participants who had private land tenure and some GO participants who were land tenure holders were found to be practicing agriculture, giving it preference over forestry, which revealed the need to intensively examine the land tenure issue. In terms of synchronisation with the farmer's desires, forestry was the preferred topographically suitable land use, as participants exhibited the tendency to plant trees in the form of forestry or agro-forestry on whatever land was available to them.

Empirical studies showed that all the intervening agencies more or less met the project goals of income generation and increased forest cover. However, an attempt to perform in-depth componential exploration of such objectives pointed to only partial socio-economic upliftment and very partial participatory achievements. Moreover, performances among the organizations as well as their interrelationships showed that those partially achieved goals demonstrated both componential similarity and variability. These findings shed light on general and component-wise issues, pointing towards organizational requirements and means to planning further PF interventions in CHT.

Though social capital and inclusion were notably achieved, PF agencies generally regulated projects, with only a few influential farmers participating and governance activities inadequately addressed, resulting in a patronising influence over poor farmers. Thus, partial participation was observed overall, with irregular and occasional interaction between farmers and participating agencies, a predominantly top-down approach in management function, and minimal decentralising trends in functional decision-making were limited to only a few implementing issues. Comparatively more flexibility was provided in NGO than in GO project design, which was comparatively more in FD projects than those of CHTDB.

Major observations and findings

General Issues

- a. PF practices carried out in CHT mainly covered the low hill areas where hill dwelling communities and nomadic people continue *jhuming* particularly in the higher slopes.
- b. Of the 12 ethnic communities, 5 (Chakma, Marma, Tripura, Murong and Bawm) were predominantly found to be involved in PF practices.
- c. NGO involvement in GO interventions was absent and similarly GO intervention on private lands was absent, with GO interventions covering only government lands.
- d. GO and NGO linkages in PF activities were almost absent.
- e. Chakma community involvement in CHT PF practices was found to be less, in number of participants, as compared to Marma and Tripura.
- f. In selecting participants, both the GO and NGO PF agencies did not consider gender issues. The Chakma, Marma and Tripura communities are male dominated and so a gender balance needs to be maintained.

- g. The participation of women in decision-making in PF practices with respective agencies was almost absent as household decision-making was generally male dominated.
- h. Participant selection was made irrespective of community consideration, but locality-based proportionate harmonious community participation was observed. Mixed religious harmonious participation was observed.
- i. There were no definite age criteria informing participant selection. However, the participating agencies gave priority in selecting middle aged farmers.
- j. More aged and less educated farmers were found having larger family sizes. Social awareness through PF intervention encouraged family planning by the participants.
- k. Participants were aware about the importance of keeping family size reasonable. However, they have an inherent desire for more children because of the belief that more children mean more labour that can earn more income.
- l. Leasehold land tenure already provided by the GO agencies is the reflection of a government intention to provide secure land tenure to all the participants. The agreement signing and handover was delayed in most cases as providing land tenure to the participants is a complex activity that involves multiple agencies.

Income Generation

- a. Due to PF interventions, participants' income increased significantly as compared to a scenario without the projects. The increased incomes were due to improved farming practices and off-farm income mainly earned as wage labour.
- b. The majority of the participants' average annual income was found to fall in the lower to middle levels, but some exceptions of higher level income generation were noted. Variation in income exists among the types of beneficiaries due to not placing similar endeavour in generating farming income.
- c. Both similarity and variation were found among the farming componential incomes between the types of beneficiaries.
- d. Those farmers who were previously comparatively poor (GO farmers), were found giving to endeavour more in their farming practices, which resulted in comparatively more intensive farming by them.

- e. Increased landholdings did not automatically increase income proportionately. It was the intensity of farming practices that was the main contributor to income.
- f. All the land-based income generating components played significant roles in farming income generation.
- g. Farming component-wise income generation varied from lower to higher levels among the participating farmers, though the majority were fell in the lower income levels.
- h. Species selection played a vital role in forest income generation. Participants selected economic trees considering earlier return; the outcome of their inherent wish to earn quick money.
- i. Bamboo production was found to be insignificant mainly because of a lack of knowledge about the income generating opportunities and improved planting techniques of this minor forest produce.
- j. The possibility of increased income from agriculture and livestock practices was evidenced.
- k. Participants were found to be searching for other income sources along with farming practices.

Expenditure Patterns

- a. Participants incurred expenses in implementing farming, livelihood and social activities. Expenditure was found almost proportionate to the income of the respective participants. Incurrence of farming expenditure was a new item for GO participants and increased significantly by the NGO participants as compared to without project scenario.
- b. Those participants' who incurred expenses more in farming, earned more income.
- c. Farm income was the major contributor to the total income of the participant but majority incurred low level expenditure in farming and hence earned also in low levels.
- d. In general priorities were given to fruit trees, agricultural production and livestock rearing. Comparatively more expenditure was found in case of fruit production.
- e. Forestry loving tendency of CHT people were reflected by incurring significant amount of their expenditure in forestry but more preferably for fruits and other economic trees.

- f. NGO participants were found more interested in agriculture than that of forestry. GO participants were found interested in fruit trees than that of NGOs.
- g. There was no initiative taken from PF agencies for proper marketing of farm products.
- h. Social expenditure incurrence by the GO participants was mainly limited to health and dress before project interventions had been increased significantly and manifested as spread to education of their children, entertainments and festival issues. NGO participants being comparatively more well off than that of GO participants before the projected interventions were incurring all the social expenditure components on a small scale had also been increased significantly.
- i. All the components of social expenditures were given due consideration by the participants because of the social awareness developed among them. Participants gave emphasis on providing basic need facilities to their children for good health and education.
- j. After spending health and education related expenses with a similar emphasis, poor farmer's expenses were less in other social components as compared to the rich participants. They did not have such ability after spending health and education related expenses.

Participation

- a. Participation between the PF intervening agencies and the participants were found to be partial with a slow progressive trend along the course of time, as viewed through the opportunities and prevalence indicators of participation.
- b. Project management functions were not decentralized mainly due to the top-down approach. Functional decisions of some implementing issues were seen as tending towards decentralization.
- c. Establishment of necessary linkages was found to be irregular during the project period and occasional after the end of the project. The flow of information among the stakeholders and related offices was also irregular.
- d. Projects were centrally designed giving partial flexibility that was comparatively more in NGO projects, followed by FD and then CHTDB.
- e. Incentives were provided mainly at one time during the project period.

- f. Decision-making for both operational and management tasks was highly dominated by PF agencies. Decision-making opportunities for the participants were seen mainly in fruit and agricultural crop production, and their harvesting and marketing. NGOs were found to provide more flexibility than GO agencies.
- g. Monitoring and evaluation was found to be the pre-decided responsibility of PF agencies.
- h. Benefit sharing was decided by the PF agencies and imposed on the participants.

Achievements

- a. For physical and qualitative assessments, the projects set objectives of settled farming, greening the hills in PF villages, economic and social upliftment of the participants, involvement in participation, were mostly achieved. However, in-depth quantitative studies showed that achievements were partial and there were ample needs and opportunities to improve the same. Therefore, partial contributions to the economic welfare of the participants were achieved.
- b. Micro-environments in PF villages looked visibly green, but adequate and improved watershed management measures were minimal.
- c. Human capital development measures were generally undertaken by arranging once-off, short term training programmes during project periods, with a few exceptions in the case of NGO projects.
- d. Social capital and inclusion were notably attained. Improvement of participants' living conditions was visible through their expenditure on various social activities, establishment of marriage relations, more visits to relatives' homes, and contact strengthening with local leaders and institutions. Though participants were found to be aware about the need for an improved living environment, the influence of patronising over poor farmers was a visible scenario.
- e. PF agency controlled and regulated participation was seen. Visible interaction of farmers with the agencies was mainly by a few influential farmers. Male dominated partial participation was seen on the functional level, as women's participation in decision-making was minimal.
- f. Agreement signing and handover were delayed. Land tenure issues were not timely or properly addressed.

- g. Local institutions were formed and leaders were selected mainly on a nomination basis by influential people. Meeting arrangements were irregular and poor farmers attended voicelessly behind their respective patrons.
- h. PF interventions in CHT played a vital role in increasing the economic welfare and social upliftment of the participants, which reduced their poverty as well as encouraged land-based resource development. The annual income of participants increased manifold due to their participatory involvement in farming practices. The tree resources they already gained by forestry and agro-forestry plantations will provide them large income at one time after the gestation period, which will again play an immense role in mitigating their poverty in the future.

Key Recommendations

(Recommendations related to) General Issues:

- a. PF practices should spread to high hill areas by involving related communities. However, this should be done based on intensive studies and specially-designed projects with a motive to involve local people in sustainable land-based resource management in CHT. Conducting in-depth studies by incorporating topography, sound environmental management, socio-cultural issues and livelihood strategies of the communities would greatly help increase the efficiency of project implementation.
- b. In order to involve communities that are not yet involved in PF practices, locality-based special projects should be undertaken incorporating communities' specific tradition, culture and interest as much as possible, to match with the system and surrounding context.
- c. NGOs should be involved in group mobilisation and related activities in a similar way to how they were involved in plain land PF projects.
- d. GO agencies may start PF activities in rural CHT areas by establishing links with NGOs.
- e. GO PF projects should be undertaken by covering land surrounding homesteads and institutional planting in government as well as private lands of CHT, as is done in the plain lands.

- f. Effective GO and NGO links should be established through different linkage mechanisms, such as giving specific tasks, more visits to each others' offices, more meetings and interactions, etc.
- g. The reason for lower involvement of the Chakma community should be explored and adequate steps should be taken to involve and ensure their gainful participation.
- h. Whether the gender issue will be given preference and both husband and wife will be selected as joint participants in future PF programmes should be ascertained by performing in-depth locality, community tradition and culture based studies, formulating pilot projects and incorporating awareness training on gender issues.
- i. Training courses on gender issues in PF development should be undertaken for both PF agency personnel and participants.
- j. Locality-based proportionate mixed community participation should be continued in the near future. Pilot studies on the harmony of PF practices in the presence of a significant number of members of each ethnic community in each village should inform future policy.
- k. Activities influenced by participants' beliefs should be avoided.
- l. Present systems of participant selection without any definite age criteria should be continued. Studies should be undertaken to explore and identify factors that influence the selection of young and workable age farmers.
- m. As education influences family size and thereby family planning issues, formal and informal training and educational programmes should be undertaken for the participants and also for their children by establishing schools in or near villages. For this, proper linkages should be established with such service providers who are active in education sectors.
- n. Along with social awareness campaign for keeping family size reasonable through training and education, miscellaneous income generating opportunities should be explored by establishing linkages with development sector.
- a. PF agencies' roles to communicate with the related government departments responsible for providing land tenure should be strengthened. NGOs may be involved in communicating with the Forest and Land Revenue Departments as well as advocacy service providers.

Income Generation

- a. Farming income generating activities should be strengthened by nurturing favourable factors.
- b. Off-farm income opportunities should be developed and new income sources should be explored through different income-generating service providing agencies.
- c. Measures should be taken to encourage farmers to endeavour more to perform intensive farming practices in order to generate potential high levels of income. This can be achieved through quality input supply, provision of required technical assistance as well as attempts to increase farmer motivation and capacity.
- d. Those farmers practicing less-intensive farming should be identified for future help and guidance. For this, participant-wise need and goal oriented assessment of componential farming priorities should be undertaken.
- e. Both GO and NGO PF agencies should preferably target poor and needy farmers in future PF programmes. Those farmers who may need help, guidance, supervision and control should be identified and measures should be taken accordingly.
- f. The main criterion informing the amount of land allotted in the future should be ascertained on the basis of the participants' ability to carry out the desired level of intensive farming.
- g. The present system of giving importance to all the farming components should be continued.
- h. Component-wise low level income generating farmers should be targeted in order to increase their capacity to carry out more intensive farming.
- i. The species giving quick economic returns should be given preference along with the planting of ecologically suitable species, in accordance with site and local needs. For this, a basket of suggested trees (forest and fruit trees) should be provided from where farmers can choose species for planting. Awareness generation and adaptive campaigns for ecologically suitable species, training, etc., should be undertaken and be addressed accordingly. For suitable species selection by the farmers, such flexibility of choosing species should be incorporated in the project models.
- j. Small-scale bamboo cultivation in and around homesteads and also in specific suitable land areas can be performed. Awareness generation and training about improved technology of bamboo

nursery practices, clump management, cultivation, etc, should be conducted.

- k. Agriculture and livestock practices should be intensified via establishing links with the Agriculture and Livestock Departments in an integrated form by providing related capacity building training as well as goods and services.
- l. Off-farm income generating opportunities should be provided to the participants by mobilising available GO and NGO resources.

Expenditure Patter

- a. Expenditure incurrence in farming, livelihoods and social activities should be encouraged in future.
- b. Those participants who earned more were also found to spend more. Therefore, participant-wise, income-based expenditure should be properly addressed in order to involve participants in improved farming practices by providing genetically improved species as well as intensification of farming by adopting appropriate measures. Provision for the supply of a proper quantity of improved quality inputs and the selling of farm outputs at proper prices, improved post harvesting practices and proper marketing (by strengthening both forward and backward linkages to the farm production system) should be given appropriate attention, as well as catalysing off-farm income generating avenues as complementary and supplementary activities.
- c. Awareness generation about the benefit of certain expenditure for better lifestyle maintenance should be continued in the future, with PF agencies making initiatives, even after the end of projects. Such attempts may sustain the socialisation impacts of PF interventions and its probable manifestations.
- d. Componential priority expenditure incurring trends should be continued. Giving comparatively more priority to fruit species by GO participants and that of agriculture by the NGO participants should be guided by environmental adaptability based on topographical suitability.
- e. Measures should be taken to address the low level of investment by the majority of farmers. Targeting should be done by conducting yearly need-based surveys and financing them by mobilising available GO and NGO resources and microfinance institutions.
- f. Expenditure incurrence priority given to fruit species as compared to timber species should be given due attention. The trend of major

investment to be in fruit species can be capitalised upon by planting fruit species that yield timber as well. Fruit storage and processing facilities should be developed wherever needed.

- g. Awareness campaigns should be initiated to educate participants about the environmental needs of forest species, the lower expenditure required for their maintenance, their ability to contribute a large amount of income at one time after maturity, and their use in managing watershed, as a non-negotiable determinant in PF practices in CHT.
- h. Improved facilities for health and education should be provided in the future as part of the project package.
- i. Poor farmers should be encouraged to improve their economic conditions as well as allowing occasional subsidies in the form of incentives for participation in social activities other than health and education.

Participation

- a. Participation should be encouraged and strengthened by appropriately addressing the catalysing factors that enhance participation.
- b. Gradual decentralization of future PF projects via bottom-up approaches should be undertaken. This can be done by improving local governance by empowering local stakeholders and building their capacity to make managerial and technical decisions.
- c. Regular and adequate connections should be established among the project stakeholders, and the local and central offices of PF agencies. Both verbal and non-verbal communication processes and systems should be established by introducing study-based improved and rapid communication.
- d. Local level plans should be developed through stakeholder consultation. Adequate flexibility should be provided in project design so that specific local requirements can be addressed properly in the implementation of future PF projects.
- e. Adequate and regular incentives should be provided for sustaining the interests of the participants. This can be done by carrying out need-based surveys on at regular intervals.
- f. Participatory decision-making is a must for effective implementation and wider impact on local communities. Participatory access of the participants should be given due consideration in deciding all asset creation, protection management

and operational tasks, keeping in mind the bio-physical suitability. Such participation should be encouraged through the formation of community-based organizations and increasing participant capacity to develop and maintain such land-based resources including trees.

- g. Participatory monitoring and evaluation techniques should be adopted by establishing the appropriate operational mechanisms required for mid-term corrections as and when needed.
- h. Equitable distribution of project benefits needs to be ensured by actively involving participants. To fix and distribute benefits, initial negotiations can be held with the participants. Transparent and accountable distribution should be ensured for sustained involvement of the participants both during and beyond the project period.

Achievements

- a. Available and potential opportunities should be explored and widened, as well as appropriate measures undertaken to involve the participants in contributing their highest endeavour in achieving PF goals.
- b. Participants' self-employment in their respective farming work should be strengthened. Other employment and associated opportunities should be catalysed by various available means.
- c. Knowledge-based integration of forest management with a watershed management approach should be undertaken. Measures should be taken to identify micro-watersheds, taking into account the holistic contexts of the macro-watersheds of the region. Environmental awareness campaigns should be continued in a sustainable way.
- d. Refresher training should be introduced in the future and local institutions should be made capable of running and continuing the programmes even after the project period.
- e. Encouragement of participants' social upliftment should be continued in the future. Measures should be undertaken to minimise the negative effects of patronisation.
- f. Bottom-up approaches should be given preference to strengthen participation by incorporating gender issues in male dominated communities. PF agency personnel should be given frequent training in order to fully orient themselves towards community forestry. Participants should also be given continual training after reasonable intervals of time in order to sustain and enhance participation.

- g. Time schedules for agreement signing and handover should be framed for building the trust of the participants and ensuring effective participation. The complex issue of land tenure should be addressed properly based on land status and associated issues.
- h. Local institutions, their formation and activities should be under participatory advisory guidance, balancing the tradition and culture of the local communities with required awareness campaigns about the local institutions' roles in PF practices.
- i. Land-based resource management through PF farming practices should be continued to be nurtured in order to sustain the achieved poverty reduction of participants. Tree resources should be planted intensely with the objectives of earning a large amount of income at one time after the tree gestation period and environmental sustainability.

Recapitulation and Epilogue

Owing to regressive policies and management measures in the past, the forests of the Chittagong Hill Tracts (CHT) in Bangladesh have been alarmingly degraded. CHT is a unique mountainous location in the country where diverse ethnic communities live with nature as their prime means of livelihood. With the introduction of alienating measures, the rights and privileges of the forest dependent people were continuously ignored. The ultimate result was the degradation of forests and the surrounding environment. The vast Unclassified State Forests (USF) has been almost completely denuded, resulting in land degradation and constrained livelihoods of the forest dwelling communities. In order to combat the loss of forest and subsequent environmental degradation, as well as to reorient the trend of degradation towards its reverse in progressive succession, Participatory Forestry (PF) emerged.

In CHT, PF practices were initially employed, and have been continued, in the form of *jhumia* rehabilitation on USF land by the government organisations (GOs) the Forest Department (FD) and Chittagong Hill Tracts Development Board (CHTDB). Additionally, some non-government organisations (NGOs) have also practiced PF in separate project interventions targeting marginal *jhumia* farmers from long-established villages and *jhum* land holders under the traditional system of land allocation in CHT. Though these GO and NGO PF agencies possess their own technologies and management measures, their goals were commonly those of greenery development through PF farming practices for poverty reduction and participation, economic and social upliftment of the farmers and environmental development.

This study has attempted to explore and document the PF practices and the individual and comparative performances, variations and relationships among the FD, CHTDB and NGO PF practices. This encompasses research on general demographic issues and land use preferences shedding light on componential income generation and expenditure patterns as well as participation and achievements pointing to poverty reduction and participation. An attempt was made to gather information from which can be drawn future policy and functional-level recommendations and guided directives, based on the in-depth

empirical findings and impacts and implications of this report. With this end in view, this study begins with a review of trends in forest management towards forest degradation and alienation of forest dwelling people and an outline of the land and land use of Bangladesh with special reference to CHT and the means and nature of livelihood of the CHT people. The emergence and progress of PF in Bangladesh, a brief review of the PF practices and studies from global, regional and Bangladesh perspectives, along with a brief review of the project programmatic interventions in CHT and their goal-oriented objectives has been outlined; this information guided the formulation of the research framework and methodological considerations for this study.

This study was based on both the primary and secondary sources of information, adopting methodological pluralism combining qualitative and quantitative methods. Data was collected on different components of PF land use practices and participation, focusing on planned (researchable) issues, factors, determinants and indicators by using structured and unstructured questionnaire interviews and surveys, discussions with focus groups and key informants, along with observations of the systems and surroundings including participant observation, etc. Study projects and sites were determined based on PF agency-wise interventions and an attempt to cover the three districts of CHT so that the study covered the macro-level, considering the opportunities to observe in-depth componential performances. The Chakma, Marma and Tripura communities were selected due to their major involvement in PF activities and concentration in CHT.

Project interventions of the different PF agencies were mainly found to be single-organisation initiatives. Though management practices differed, land use components and operational tasks, including silvicultural and other related technical works, were found to be similar, with the exception of compost fertiliser production by NGO farmers. PF goals were also the same for all the intervening agencies, mainly focusing on socio-economic and participation issues via settled PF practices. Empirical studies showed that, in general, all the intervening agencies more or less obtained the project goals of income generation and increased forest cover. However, an attempt to perform in-depth componential exploration of such objectives pointed to only partial socio-economic upliftment and very partial participatory achievements. Moreover, performances among the organisations as well as their interrelationships, as explored under the different study issues based on the framework of the study, showed that those partially achieved goals demonstrated both componential similarity and

variability. These findings shed light on general and component-wise issues, pointing towards organisational requirements and means to planning further PF interventions in CHT.

All the PF interventions studied were independent in nature, with GO and NGO linkages, inter-sectoral coordination and the provision of necessary services shared amongst the organisations almost absent, and mainly covered the low hill areas of CHT when they did exist. Locality-based proportionate mixed-religion and mixed-ethnicity harmonious community participation was observed. The Chakma community involvement was found to be less compared to the Tripura and the Marma communities. Middle-aged workable *jhumia* farmers were given preference in participant selection by PF agencies. Gender issues were not considered in participant selection and household decision-making was found to be male-dominated.

Land tenure documents had been provided to some PF villages, and for some others the process was under progress. Forestry, agro-forestry, agriculture and livestock rearing were the common land uses in all the GO and NGO PF villages studied. In the GO villages, lands allotted for horticulture and agriculture were converted to forestry and agro-forestry, reflected the same as preferred land uses, with agro-forestry comparatively preferable to forestry. NGO participants who had private property land tenure and some GO participants who were land tenure holders were found to be practicing agriculture, giving it preference over forestry, which revealed the need to intensively examine the land tenure issue. In terms of synchronisation with the farmer's desires, forestry was the preferred topographically suitable land use in terms of situational suitability, as participants exhibited the tendency to plant trees in the form of forestry or agro-forestry on whatever form of land was available to them. Livestock rearing was also found to be a common practice. In general, forest management was the main focus of PF farming practices, while watershed management was given poor attention.

The income of all GO and NGO participants increased significantly compared to their incomes before PF projects. However, the income levels showed potential to increase earnings to notable extent via exploration of all the land-based income generation components individually and also in totality, analysing them for componential relativity and organisational variability. Intensity of farming practices was the main contributor to income, with variation among PF organisations due to participants not employing similar endeavour in

their farming practices. Comparatively poorer farmers were found to be making comparatively more effort, resulting in more intensive farming and thereby generating greater incomes. Knowledge-based species selection played a vital role in forest income generation and participants' intended to select economic trees though they were aware about the importance of ecological considerations of species selection. Along with farming, participants searched for other income sources, such as day labouring.

Participants expended their incomes on farming, livelihood and social activities. The majority of participants incurred low level expenditure for farming and thereby earned at low levels. As in the case of income generation, componential exploration of their expenditure patterns reflected the forestry-loving tendency of CHT people in their incurrence of forestry expenditure for fruit and other economic trees. General priority was given to fruit production followed by agriculture and then livestock. Contrastingly, GO participants were more interested in planting fruit trees and NGO participants in doing agriculture. There were no initiatives made by PF agencies for the marketing of farm products. The development of social awareness was indicated by participants' expenditure incurrence for health, education, dress, entertainment and festivals, which was mostly limited to health and dress expenditure on a small scale before project intervention. Priorities for expenditure were in health and education for all participants, with comparatively lower expenditure in other social components, especially by poorer farmers.

Partial participation with a slow progressive trend was observed overall, with irregular and occasional linkages, a predominantly top-down approach in management function, and minimal decentralising trends in functional decision-making limited to only a few implementing issues such as fruit and agricultural crop production and their harvesting and marketing. Comparatively more flexibility was provided in the project design in NGO than in GO projects, which was comparatively more in FD projects than those of CHTDB.

Regarding achievements, the objectives of settled farming, greenery development, socio-economic upliftment and involvement in participation were qualitatively observed to have been mostly achieved, but the quantitative assessments showed need and ample opportunity to improve the same, thereby indicating partial achievement of economic welfare of the participants. Though social

capital and inclusion were notably achieved, a patronising influence over poor farmers was visible. PF agencies generally regulated projects, with few influential farmers participating. Partial and male-dominated participation was observed. Governance activities were not properly addressed, as there was poor attention given to dealing with agreement signing, land tenure issues, the nomination basis for local institutional leadership formation which was biased by influential people, irregular meeting arrangements, etc.

Nevertheless, the tree resources the projects developed via forestry and agro-forestry plantations will play an immense role in poverty reduction in the future by providing participants with a large amount of income at once after harvesting upon maturity.

Accordingly, policy and functional level recommendations were made focusing on the impacts and implications of the above findings and observations in order to sustain and nurture future land-based resource management through PF farming practices in CHT. Notwithstanding the strategic and functional significance and topicality of the subject (PF) and the region (CHT), relevant research has been strikingly limited. This interesting area of study deserves greater attention from academics and practitioners alike.

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Index

A

afforestation, 19, 23, 28, 65, 69, 75, 93, 97, 102, 110, 112, 116, 119, 125, 126, 127, 128, 129, 130, 131, 132, 133, 135, 136, 141, 157, 329, 334

afforestation, 329

Afforestation, 112, 125, 129, 130, 131, 132, 159, 160, 161, 162, 270, 305, 320, 329

Agriculture, 30, 35, 65, 84, 91, 124, 125, 175, 185, 186, 198, 200, 223, 224, 225, 226, 227, 228, 229, 240, 241, 242, 270, 273, 275, 295, 307, 309, 310, 315, 316, 318, 319, 325, 326, 331

agro-forestry, 84, 86, 87, 93, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 124, 125, 127, 128, 129, 133, 135, 151, 152, 153, 162, 163, 165, 185, 193, 197, 212, 242, 253, 254, 259, 271, 278, 284, 286, 292, 301, 303, 331

asset, 102, 152, 153, 296, 331

awareness, 114, 142, 143, 144, 146, 148, 152, 153, 154, 164, 181, 182, 208, 216, 225, 234, 237, 238, 241, 243, 254, 255, 261, 265, 267, 270, 275, 277, 278, 279, 284, 288, 290, 293, 297, 298, 302, 331

B

Bamboo, 30, 57, 72, 86, 185, 186, 203, 205, 206, 207, 208, 209, 229, 230, 232, 233, 234, 235, 240, 279, 289, 331

Bandarban, 71, 80, 81, 82, 117, 118, 123, 126, 132, 135, 136, 140, 150, 158, 160, 162, 163, 164, 166, 175, 179, 187, 266, 268, 308, 331

Bangladesh, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 33, 34, 35, 36, 40, 41, 49, 56, 57, 59, 60, 61, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 79, 81, 82, 87, 89, 90, 91, 92, 93, 95, 96, 98, 99, 101, 102, 103, 104, 105, 107, 108, 109, 110, 111, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 132, 140, 143, 149, 150, 151, 161, 162, 165, 167, 169, 175, 177, 187, 263, 285, 299, 300, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 331

basic needs, 20, 22, 35, 69, 279, 331

benefit sharing, 23, 28, 92, 93, 99, 114, 125, 126, 128, 131, 134, 135, 141, 148, 154, 184, 247, 250, 251, 255, 258, 282, 285, 331

bottom-up, 69, 123, 281, 285, 296, 331

Bureaucracy, 31, 155, 260, 331

C

campaigns, 110, 117, 225, 241, 242, 265, 270, 274, 278, 294, 296, 297, 298, 331

capacity building, 69, 97, 114, 231, 275, 278, 280, 282, 295, 331

Caritas, 117, 143, 144, 158, 159, 160, 164, 172, 231, 255, 332

Chakma, 19, 25, 32, 75, 77, 78, 79, 80, 81, 82, 83, 87, 158, 161, 163, 164, 169, 178, 179, 180, 181, 185, 187, 188, 264, 265, 266, 268, 287, 293, 300, 301, 311, 321, 323, 332

Chittagong Hill tracts, 128, 311, 332

Chittagong Hill Tracts Development Board (CHTDB), 157, 286, 299, 332

Chittagong Hill Tracts Development Board (CHTDB), 157, 299

commercialisation, 21, 27, 28, 42, 46, 63, 64, 65, 88, 89, 98, 107, 332

communication, 47, 55, 82, 92, 97, 101, 106, 116, 118, 145, 147, 155, 252, 270, 280, 296, 332

community, 20, 21, 22, 23, 24, 27, 32, 34, 37, 38, 39, 40, 41, 45, 51, 56, 59, 60, 61, 62, 67, 75, 77, 78, 80, 81, 82, 84, 88, 89, 92, 93, 96, 97, 98, 99, 100, 101, 104, 109, 110, 111, 113, 114, 117, 118, 122, 142, 151, 161, 162, 164, 175, 179, 180, 187, 188, 189, 252, 260, 264, 265, 266, 270, 285, 287, 288, 293, 297, 301, 332

conflict, 19, 27, 40, 61, 96, 107, 128, 332

conservancy, 46, 49, 50, 54, 332

conservation, 19, 38, 39, 47, 62, 64, 67, 73, 88, 94, 105, 114, 119, 121, 124, 204, 274, 332

consultation, 113, 134, 161, 235, 281, 282, 296, 332

correlation, 194, 201, 204, 207, 217, 218, 219, 227, 232, 233, 236, 237, 332
 Cultivation, 48, 82, 118, 120, 122, 123, 146, 147, 159, 164, 255, 317, 321, 323, 332
 culture, 25, 34, 36, 37, 47, 51, 75, 77, 79, 89, 94, 122, 141, 172, 187, 243, 265, 292, 293, 298, 332

D

Decentralization, 30, 244, 280, 306, 307, 332
 decision-making, 120, 154, 169, 245, 265, 269, 280, 281, 282, 287, 288, 291, 296, 301, 302, 332
 deforestation, 21, 22, 23, 33, 36, 72, 74, 91, 104, 107, 108, 119, 142, 148, 253, 332
 degradation, 19, 21, 29, 33, 34, 35, 89, 91, 98, 108, 109, 117, 119, 121, 129, 132, 146, 148, 149, 165, 173, 263, 285, 299, 300, 332
 determinant, 20, 30, 211, 241, 269, 274, 278, 296, 332
 distribution, 69, 71, 75, 81, 102, 108, 110, 111, 112, 114, 115, 117, 139, 180, 259, 282, 297, 332

E

economic upliftment, 91, 113, 128, 132, 135, 141, 142, 156, 195, 209, 212, 252, 287, 300, 302, 332
 Economic welfare, 24, 152, 251, 332
 economy, 56, 59, 78, 82, 83, 84, 88, 89, 103, 123, 332
 educational, 30, 153, 268, 293, 332
 effective people's participation, 19, 24, 98, 177, 332
 Empowerment, 27, 97, 104, 332
 Environmental development, 332
 Equity, 255, 332
 ervices, 20, 332
 ETHNIC COMMUNITIES, 332
Ethnicity, 82, 178, 181, 311, 327, 332
Evaluation, 30, 110, 247, 248, 249, 250, 282, 307, 308, 309, 310, 314, 316, 324, 325, 332

Exclusion, 323, 332

Expenditure, 29, 30, 152, 153, 154, 177, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 256, 277, 289, 295, 332, 333, 334
expenditure patterns, 224, 239, 299, 302, 332

F

Family, 161, 162, 175, 180, 182, 183, 267, 332
 Farm Expenditure, 30, 214, 218, 219, 223, 227, 228, 229, 240
 Farm Income, 30, 190, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 210, 217, 218, 219, 221, 235, 252, 332
Forest Act, 47, 51, 55, 60, 63, 70, 115, 307, 326, 332
 Forest Department, 26, 40, 45, 47, 49, 52, 54, 55, 57, 60, 65, 67, 69, 71, 73, 74, 88, 98, 99, 110, 114, 115, 124, 125, 127, 131, 132, 157, 159, 160, 161, 162, 166, 171, 175, 181, 183, 184, 186, 187, 190, 192, 193, 197, 198, 200, 204, 205, 206, 210, 213, 214, 217, 223, 224, 226, 230, 233, 236, 247, 263, 286, 299, 305, 307, 308, 309, 310, 311, 315, 317, 318, 320, 322, 324, 326, 332
 Forest dwellers, 20, 332
Forest Income, 204, 205, 207, 211, 252, 333
 Forest Management, 20, 33, 35, 36, 39, 40, 42, 49, 93, 176, 255, 268, 283, 306, 307, 309, 310, 311, 313, 316, 317, 318, 319, 321, 322, 324, 325, 333
Forest Policy, 23, 63, 64, 65, 67, 68, 69, 89, 99, 109, 132, 307, 308, 309, 312, 315, 316, 317, 319, 320, 321, 333
 Forest protection, 333
 Forest resources, 35, 42, 333
 Forest restoration, 333
 Forest use, 333
 Forestry development, 333
 Forestry Expenditure, 30, 222, 229, 234, 240
 Forestry income, 203, 273, 333
 Fuel wood, 333

G

gender, 29, 73, 121, 134, 173, 178, 179, 187, 265, 287, 293, 297, 333
 gestation, 96, 204, 230, 268, 274, 292, 298, 333
 good governance, 24, 151, 152, 283, 333

H

headman, 84, 172, 257, 264, 269, 333
 health, 24, 115, 116, 235, 237, 242, 243, 256, 276, 279, 290, 296, 302, 333
 Hill Forest, 20, 324, 333
 hill-dwelling, 82, 160, 179, 187, 264, 333
 hilly area, 19, 212, 333
 hilly region, 19, 121, 126, 241, 253, 266, 269, 275, 333

household, 61, 83, 86, 121, 127, 130, 136, 139, 154, 165, 166, 168, 169, 170, 178, 186, 212, 264, 288, 301, 333

I

Incentives, 30, 94, 244, 246, 281, 290, 333
 Income, 29, 30, 153, 155, 177, 188, 190, 192, 193, 194, 195, 196, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 217, 218, 219, 220, 221, 222, 235, 251, 252, 271, 272, 274, 275, 288, 294, 333
 income generation, 30, 116, 131, 139, 140, 143, 153, 188, 197, 199, 207, 211, 216, 225, 230, 234, 267, 268, 271, 272, 273, 274, 277, 278, 283, 284, 287, 288, 289, 299, 300, 301, 302, 333
 indicator, 35, 154, 246, 250, 333
 indigenous people, 66, 83, 84, 157, 177, 185, 227, 229, 237, 243, 333
 inequality, 102, 333
 institutions, 91, 95, 99, 100, 101, 102, 104, 106, 108, 112, 115, 149, 175, 252, 260, 278, 285, 291, 292, 295, 297, 298, 333
 interactions, 79, 124, 258, 293, 333
 intervention, 20, 22, 24, 41, 44, 49, 54, 61, 70, 71, 88, 89, 114, 132, 156, 157, 159, 189, 253, 256, 257, 279, 287, 288, 302, 333

J

Jabarang, 146, 147, 158, 159, 160, 164, 184, 211, 246, 251, 255, 259, 269, 333
jhum, 78, 83, 84, 85, 86, 87, 89, 120, 123, 126, 138, 144, 157, 164, 184, 185, 191, 246, 251, 263, 275, 286, 299, 333
jhuming, 22, 50, 52, 54, 83, 84, 85, 86, 89, 90, 118, 126, 135, 137, 138, 139, 142, 143, 144, 145, 146, 147, 163, 180, 184, 191, 259, 260, 264, 268, 269, 275, 287, 333

K

Khagrachari, 80, 81, 118, 126, 132, 137, 140, 146, 147, 158, 160, 161, 163, 164, 166, 179, 187, 255, 266, 308, 321, 327, 333

L

Land, 83, 85, 86, 89, 94, 95, 96, 110, 124, 125, 132, 136, 154, 158, 175, 176, 183, 184, 186, 194, 195, 196, 248, 249, 250, 255, 268, 271, 286, 291, 293, 298, 301, 310, 311, 312, 313, 315, 316, 318, 319, 321, 322, 323, 325, 326, 333
 Livelihood, 24, 118, 321, 333
 Livestock, 30, 124, 198, 200, 201, 202, 211, 223, 224, 226, 227, 228, 229, 240, 242, 270, 273, 275, 295, 301, 334
 locality, 23, 36, 42, 52, 95, 97, 98, 102, 113, 120, 130, 148, 167, 172, 173, 184, 253, 254, 263, 265, 269, 270, 284, 288, 292, 293, 334
 logging, 22, 33, 72, 73, 108, 253, 255, 334

M

Marma, 19, 25, 32, 75, 77, 78, 79, 80, 81, 82, 83, 87, 158, 161, 162, 163, 164, 169, 178, 179, 180, 181, 185, 187, 188, 264, 265, 266, 268, 287, 300, 301, 334
 Monitoring, 30, 247, 248, 249, 250, 282, 291, 309, 310, 334

N

natural resources, 19, 21, 27, 38, 74, 89, 105, 119, 253, 334
 NGO, 24, 28, 29, 31, 83, 97, 114, 115, 124, 141, 146, 150, 151, 152, 154, 157, 159,

- 160, 164, 166, 167, 168, 172, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 203, 204, 205, 206, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 222, 223, 224, 225, 226, 230, 231, 232, 233, 235, 236, 241, 243, 244, 245, 246, 248, 249, 250, 251, 252, 253, 255, 256, 258, 259, 260, 261, 299, 300, 301, 302
- O**
- Off-farm, 30, 190, 192, 193, 275, 277, 294, 295, 334
- Opportunities, 30, 103, 155, 251, 334
- ownership, 27, 46, 56, 62, 79, 86, 94, 96, 97, 98, 102, 120, 123, 183, 334
- P**
- Participation, 22, 29, 30, 92, 104, 112, 117, 128, 154, 155, 177, 244, 248, 249, 258, 279, 282, 290, 296, 306, 310, 311, 314, 317, 318, 319, 322, 323, 324, 325, 326, 327, 334
- Participatory Forestry, 19, 79, 91, 92, 95, 98, 108, 113, 151, 156, 176, 177, 245, 246, 285, 299, 313, 315, 317, 321, 325, 334
- Participatory Forestry (PF), 19, 91, 177, 299
- people's participation, 19, 23, 24, 26, 27, 29, 62, 64, 65, 66, 68, 69, 70, 79, 92, 93, 96, 97, 106, 109, 110, 120, 137, 147, 148, 325, 334
- people-oriented forestry, 33, 59, 68, 89, 135, 334
- plantation, 41, 43, 44, 51, 57, 58, 73, 74, 96, 105, 111, 112, 114, 116, 117, 124, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 143, 145, 150, 157, 163, 166, 185, 189, 247, 250, 254, 255, 258, 259, 278, 283, 334
- Policy, 61, 62, 63, 64, 65, 67, 68, 75, 98, 99, 106, 110, 118, 306, 313, 316, 317, 319, 320, 321, 323, 324, 325, 327, 334
- poverty alleviation, 69, 94, 99, 109, 334
- poverty reduction, vii, 19, 20, 24, 25, 26, 27, 29, 30, 31, 84, 91, 92, 93, 113, 120, 137, 146, 149, 150, 151, 152, 155, 156, 158, 165, 251, 283, 286, 298, 299, 303, 334
- Power, 101
- Power, 334
- Price, 173
- Price, 334
- Project, 30, 70, 81, 110, 111, 112, 113, 114, 117, 118, 121, 122, 125, 129, 132, 135, 137, 138, 140, 141, 142, 143, 144, 146, 149, 158, 159, 160, 162, 163, 164, 172, 183, 187, 192, 193, 194, 195, 196, 212, 248, 249, 250, 259, 270, 290, 300, 305, 306, 307, 308, 310, 312, 313, 315, 317, 318, 319, 320, 321, 322, 323, 324, 325, 334
- public forests, 51, 63, 73, 74, 75, 334
- R**
- Rangamati, 80, 81, 119, 126, 132, 137, 142, 158, 160, 161, 164, 166, 172, 175, 179, 187, 265, 305, 308, 320, 323, 334
- re-afforestation, 28
- rehabilitation, 70, 75, 83, 116, 126, 127, 128, 129, 130, 131, 132, 133, 135, 136, 151, 157, 161, 162, 163, 164, 173, 263, 286, 299, 334
- religion, 29, 36, 77, 81, 89, 178, 180, 188, 301, 334
- reservation, 35, 47, 50, 52, 334
- resource management, 19, 25, 31, 33, 40, 56, 94, 99, 114, 121, 142, 268, 292, 298, 303, 334
- rubber, 86, 108, 120, 122, 137, 138, 139, 140, 141, 163, 190, 192, 199, 205, 211, 230, 247, 250, 255, 274, 334
- rural development, 20, 23, 26, 69, 93, 95, 100, 102, 108, 149, 151, 165, 334
- S**
- Social Capital, 30, 155, 256, 334
- Social Expenditure, 30, 212, 213, 218, 219, 221, 222, 235, 237, 238, 239, 240
- Social forestry, 23, 334
- Social Relations, 101, 334
- social status, 26, 96, 102, 121, 152, 153, 173, 244, 334

- social upliftment, 24, 26, 30, 151, 152, 158, 235, 243, 244, 256, 282, 286, 291, 292, 297, 299, 334
- species, 41, 42, 51, 58, 60, 72, 73, 86, 87, 88, 103, 105, 106, 111, 112, 120, 127, 130, 131, 133, 134, 139, 144, 145, 147, 148, 162, 163, 165, 185, 199, 208, 211, 233, 241, 242, 246, 247, 253, 258, 259, 274, 277, 278, 281, 283, 285, 294, 295, 296, 302, 334
- stakeholder, 25, 113, 270, 281, 296, 335
- strategy, 24, 26, 33, 67, 75, 93, 95, 97, 109, 148, 149, 241, 263, 265, 281, 335
- sustainability, 20, 37, 39, 40, 74, 93, 104, 105, 109, 117, 123, 126, 137, 153, 254, 281, 283, 298, 335
- sustainable development, 69, 99, 109, 115, 121, 204, 263, 335
- T**
- Tayanga, 141, 158, 159, 160, 164, 335
- Teak, 43, 51, 58, 72, 127, 131, 133, 134, 162, 212, 314, 335
- technical assistance, 67, 113, 120, 125, 126, 130, 294, 335
- Tenure, 96, 110, 183, 184, 268, 310, 313, 316, 323, 335
- timber trees, 39, 54, 147, 240, 241, 242, 244, 278, 335
- timber trees., 240
- top-down, 61, 95, 113, 118, 245, 246, 280, 281, 285, 287, 290, 302, 335
- Topography, 123, 335
- tradition, 19, 34, 36, 37, 39, 42, 94, 178, 186, 187, 243, 292, 293, 298, 335
- transactions, 101, 103, 167, 335
- Tripura, 19, 25, 32, 75, 77, 79, 80, 81, 82, 83, 87, 158, 161, 162, 163, 169, 178, 179, 180, 181, 185, 187, 188, 189, 264, 265, 266, 268, 287, 300, 301, 325, 335
- V**
- variation, 37, 108, 148, 191, 198, 204, 205, 210, 211, 212, 213, 214, 217, 223, 224, 231, 235, 236, 241, 243, 244, 248, 252, 256, 267, 271, 272, 273, 277, 288, 301, 335
- VCM (Village Common Forest), 159, 335
- vegetation, 21, 34, 35, 56, 85, 86, 87, 129, 252, 335
- W**
- women's participation, 69, 121, 265, 291, 335
- wood, 22, 41, 44, 48, 64, 65, 68, 72, 73, 74, 106, 111, 112, 114, 124, 129, 132, 186, 203, 335