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February 2015

Lesson Learning Report: Economic Empowerment of Jumiya people through Medicinal Plant Cultivation

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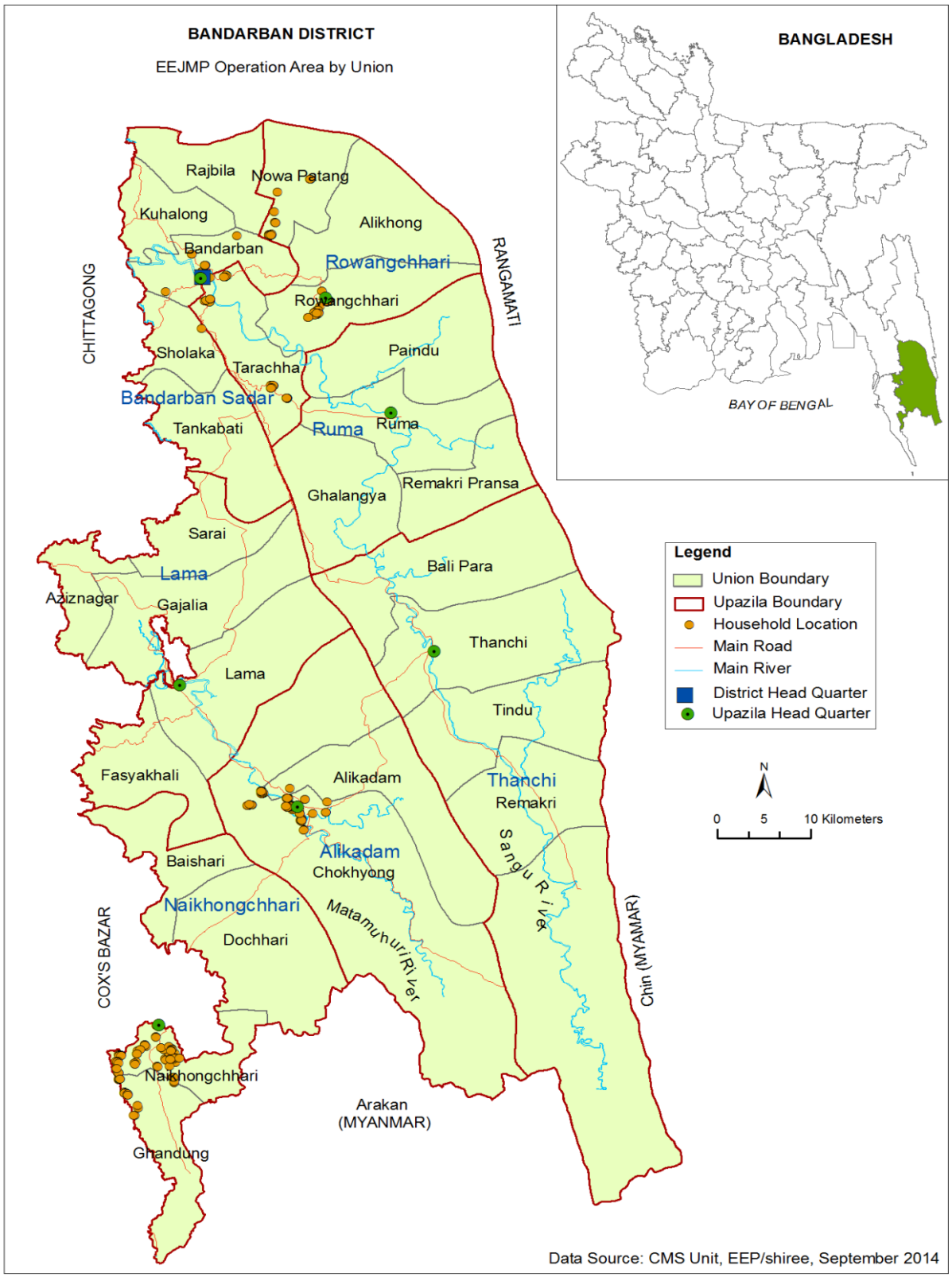

BANDARBAN DISTRICT
EEJMP Operation Area by Union
BANGLADESH
BAY OF BENGAL
Rajbila
Nowa Patang
Kuhalong
Alikhong
Bandarban
Rowangchhari
Rowangchhari
CHITTAGONG
RANGAMATI
Sholaka
Tarachha
Paindu
Bandarban Sadar
Tankabati
Ruma
Ruma
Ghalangya
Remakri Pransa
Sarai
Lama
Bali Para
Aziznagar
Gajalia
Thanchi
Lama
Tindu
Fasyakhali
Alikadam
Thanchi
Remakri
Sangu River
Alikadam
Baishari
Chokhyong
Naikhongchhari
Matamuhuri River
Dochhari
COX'S BAZAR
Chin (MYAMAR)
Naikhongchhari
Arakan
(MYANMAR)
Ghandung
Legend
Union Boundary
Upazila Boundary
Household Location
Main Road
Main River
District Head Quarter
Upazila Head Quarter
N
0
5
10 Kilometers
Data Source: CMS Unit, EEP/shiree, September 2014

List of Acronyms

BHDC – Bandarban Hill District Council
BHH – Beneficiary Household
BCSIR – Bangladesh Council of Scientific and Industrial Research
BFRI - Bangladesh Fisheries Research Institute
CF – Community Facilitator
CHT – Chittagong Hill Tracts
CHTDF – Chittagong Hill Tracts Development Facility
CMS – Change Monitoring System
DAC – Development Co-operation Directorate
DAE –Department of Agricultural Extension
DC – District Commissioner
DfID – Department of International Development
DLS – Department of Livestock Services
DRR – Disaster Risk Reduction
ECo-Development - Ethnic Community Development Organisation
EEJMP – Economic Empowerment of Jumiya People through Medicinal Plant Cultivation
EEP – Economic Empowerment of the Poorest / Shiree
FGD – Focus Group Discussion
GoB – Government of Bangladesh
HIES – Household Income and Expenditure Survey
IAP – Independent Assessment Panel
IC – Inter Corporation
ICIMOD – International Centre for Integrated Mountain Development
IF – Innovation Fund
IGA – Income Generating Activities
KII – Key Informant Interview
LLR – Lesson Learning Report
MDG – Millennium Development Goal
M&E – Monitoring and Evaluation
MFI – Microfinance Institution
MOEF – Ministry of Environment and Forest
MOHFW – Ministry of Health and Family Affair
MOU – Memorandum of Understanding
NGO –Non-Governmental Organisation
OECD – Organisation for Economic Co-operation and Development
SALT – Sloping Agricultural Land Technology
SDC – Swiss Agency for Development and Cooperation
SDG – Sustainable Development Goals
SAAOs – Sub-Assistant Agriculture Officers
SWOT analysis – Strengths Weaknesses Opportunities Threats analysis
TOR – Terms of Reference
TOT – Training on Trainers
UNDP – United Nations Development Programme
WHO – World Health Organization

Executive Summary

The project Economic Empowerment of Jumiya People through Medicinal Plant Cultivation (EEJMP) was selected as part of the Innovation Fund Round Four projects of the Economic Empowerment of the Poorest (EEP)/Shiree programme, supported by Department for International Development (DfID), the Swiss Development Cooperation (SDC) and the Government of Bangladesh (GoB). The project aimed to lift 750 indigenous households in Bandarban Hill district out of extreme poverty, in line with EEP/Shiree programme approach to lift one million people out of extreme poverty. The main purpose of this Lesson Learning Report is to indentify key factors contributing to performance and to summarise lessons learnt throughout the projec. The data collection was conducted through review of project documents, purposively selected key informant interviews (KIIs) with stakeholders, site visits and observations, independent endline survey, semi-structured focus group discussions (FGDs), case studies collection and life history collection. This triangulation of data ensures that consistent findings are supported by credible evidence.

Findings

Relevance

The outputs of EEJMP project are relevant in the context of local and national priorities to lift the extreme poor out of poverty. The focus on the commercial cultivation of medicinal plants as alternative livelihoods is relevant as jhum cultivation is becoming economically and environmentally unsustainable.

Appropriateness

The intervention is culturally appropriate as adivasi have traditionally relied on traditional healers who use medicinal plants as the first point of health care, despite the declining rate of use in recent decades. The concept was well accepted by beneficiaries, communities and local government representatives. Moreover, the project's outputs are particularly appropriate given previous government institutions' incentives to encourage usage and cultivation of medicinal plants as a sustainable livelihood option have, in the past, failed due to lack of large-scale buyers.

The design of the project limits the extent to which beneficiary households (BHHs) have the option to choose their own Income Generating Activities (IGAs) and the means in which the intervention is delivered. The second year BHHs received exactly the same selection of medicinal plants, despite the learning from first year BHHs where it was found that certain types of medicinal plants were not as suitable to be cultivated in the Chittagong Hill Tracts (CHT) region. The design, implementation and monitoring and evaluation (M&E) stages of the project also did not properly consider gender, environment and disaster risk reduction.

Effectiveness

The project has made contribution to the introduction of commercial medicinal plants as an alternative income source to jhum cultivation in the CHT region. The project allows BHHs to diversify their income sources away from the labour-intensive shifting jhum cultivation.

Endline shows that there has been a significant decrease in the proportion of households' heads relying solely on jhum cultivation from 98% to 75% by the end of the project. Given that tradition and custom is still the main driver of farmer's choice, this result is noteworthy.

ECo-Development was able to source seven local and national buyers, including two major national medicinal plants' buyers. It was harder to find large and permanent buyers for certain medicinal plant, such as Kalmegh and the price fluctuation made BHHs even more dependent on ECo-Development's role as a facilitator or mediator. The current marketing channel relies on ECo-Development's upazila offices as collection points for buyers. Although this approach was effective during the project period, it poses serious issue of sustainability beyond the project period.

Efficiency

The revolving fund model allowed the cost of direct asset delivery to remain low at BDT 21,308 per beneficiary. This is because first year BHHs who received BDT 39,250 from the project funded the second year BHHs' asset delivery through cash and in kind. The efficiency of the model is, however, highly dependent on how effective the management is in managing the implementation and monitoring of this complex model. The risk for second year BHHs is high when there is poor monitoring and documentation. Moreover, as was the case in this project, first year BHHs' production yield came lower than expected due to natural disaster and so an additional amount of BDT 526,000 was spent from the project to ensure equal distribution of asset delivery to second year BHHs. The socio-economic status of first year and second year BHHs vary significantly, with 15% difference in graduation rate, BDT 2,632 difference in income improvements and BDT 118,934 difference in assets improvements from baseline to endline.

Impact

BHHs interviewed in FGDs and Change Monitoring System (CMS) 5 attributed changes to their lives to economic empowerment. Most attributed significant changes in their lives to the fact that: they are now able to diversify their income, and that their children are now educated. Graduation analysis based on EEP/Shiree multidimensional index shows that on average 87.5% of BHHs have graduated out of extreme poverty. At the end of the project, endline shows that assets mean have increased significantly from BDT 2,971 at baseline to BDT 188,002 at endline; households' income mean has increased from BDT 2,167 to BDT 12,135 at endline; 95% of households have crossed over the extreme poverty line based on 35.5 BDT/pp/pd at endline; and 69% of households at endline now consume food from five or more food groups at least once in the last week, compared to 31% at baseline. It is important to note that there is a significant difference in assets ownership value between male and female headed households with female headed households owning BDT 81,492 less at endline.

Sustainability

There were a few key factors that have been considered in this report that are perceived to have a major influence on the extent of impact sustained by the project. Positively, 97% of households' heads are now self-employed, moving away from irregular paid worker at baseline; more than 70% of households now have three or more sources of income; 91% of BHHs now save with an average savings of BDT 13,783; and 53% of BHHs are now receiving some type of safety nets, up from 2% at baseline. However, there remain critical sustainability

factors impacting BHHs ability to protect their gains beyond the project period. These are: the current marketing channel model has failed to put emphasis on the importance of capacity building of BHHs and marketing network to manage value chain beyond production, quality sorting, storage and collection of products; there is still a heavy reliance on ECo-Development for storage and buyers' dealing; and the closure of the resource centre meant that there is no avenue for BHHs to increase awareness of medicinal plants and to obtain good quality raw materials. Moreover, the issue of lack of land ownership meant that BHHs are unlikely to move away fully from jhum cultivation.

Lessons Learned

The project highlights a good potential of medicinal plants commercial cultivation in the CHT region, as there is sufficient demand for the products and these are culturally appropriate to be cultivated in the region. It provides the extreme poor an alternative source of income when adequate capital and training are provided. The project could have collaborated more with State and Non-State actors to influence policy making, particularly in terms of the economic and environmental benefits of medicinal plants versus jhum cultivation, the issue of land ownership and sustainable resource management, and to increase the health awareness benefits of medicinal plants, while working alongside with other initiatives to improve modern health services for the benefits of the extreme poor. The project flags the importance of sustainability element inclusion at all stages of the project; when these are not considered adequately, it can easily reverse the gains made by the BHHs.

Recommendations for National Government

1. Simplify process to obtain permanent registration of land tenure ownership for the extreme poor indigenous community which will lead the way to a more sustainable resource management in the CHT region.
2. Extend institutional services such as financial services, extension services and training to reach extreme poor households.
3. Increase the extent of research on scientific investigation of medicinal plants between BFRI, BARI, BCSIR and universities to inform the importance of medicinal plants, its benefits and conservation.
4. Include as part of extension services of DAE the creation of a longer term platform of resource centre learning in each Upazila in the CHT region to increase health benefits awareness of traditional medicinal plants.
5. Include medicinal plants seeds and cuttings distributions by BADC to allow farmers' access to good quality medicinal plants' raw materials.

Section 1 Background, Purpose and Methodology

1.1. Background

The Economic Empowerment of the Poorest (EEP)/*Shiree* is a partnership between UK Aid from the Department for International Development (DfID), the Swiss Development Cooperation (SDC) and the Government of Bangladesh (GoB). This report details the lessons learned from the project 'Economic Empowerment of Jumiya people through Medicinal Plant Cultivation' (EEJMP) implemented by ECo-Development from October 2011 – September 2014. This project aimed to lift 750 indigenous households in Bandarban Hill district out of extreme poverty, in line with EEP/Shiree programme approach to lift one million people out of extreme poverty.

The project was selected by an Independent Assessment Panel (IAP) and forms part of the Innovation Fund (IF) Round Four projects of EEP/Shiree. The main theme for IF Round Four projects is to achieve **sustainable impacts** in the lives of the most vulnerable and socially excluded groups: women, the elderly, the disabled and adivasis. Eight Non-Government Organisations (NGOs) projects were selected of which the total value of contracts was £2,452,233 covering 7,600 beneficiaries.

1.2. Purpose

The main purpose of this Lesson Learning Report (LLR) is to encapsulate lessons learnt throughout the project that captures the perspectives of its stakeholders. The report also benchmarks findings against project outcomes outlined in the Logical Framework and follows DAC Principles for Evaluation of Development Assistance (1991).

The objective of the report is to:

- identify the key factors contributing to performance, including initial project design, project management, delivery, and re-direction of the project following EEP/Shiree inception review and innovation review at implementation stage;
- highlight lessons (positive and negative) about what works and does not work when implementing the innovation to lift the extreme poor out of poverty in Bangladesh;
- define the extent of the impact (positive and negative) that is likely to be sustained by the project, and any approaches/tools that were useful in management and delivery of components of the programme;
- identify recommendations for: (not in any particular order)
    1. The project team as a baseline information for future initiatives
    2. Other NGOs and development practitioners to share, promote and influence good practices, scale up what works and learned from what did not work
    3. Government of Bangladesh's to influence future policy for the betterment of the extreme poor

1.3. Methodology

The overall methodology is based on a participatory approach using both quantitative and qualitative data detailed below. The report further utilises an approach that focuses on the contributions to change, rather than directly attributing all results to the project's activities, as change is not linear and is a culmination of multiple factors (UNDP, 2014: 18).

The data collection was conducted through review of project documents, purposively selected key informant interviews (KIIs) with stakeholders, site visits and observations, independent endline survey, semi-structured focus group discussions (FGDs), case studies collection and life history collection. This triangulation of data ensures that consistent findings are supported by credible evidence. Key Methods used in this report are as follows:

1. Review of Documentation

Internal and External documents were reviewed, including: project memorandum, contract agreement, inception report, project activities log, monthly, quarterly reports and self-review reports, other Monitoring and Evaluation (M&E) reports outside of EEP/Shiree Change Monitoring System (CMS), financial statements, internal and audit report, EEP/Shiree field reports, Change Monitoring System (CMS) 1 (baseline), CMS 2 (real-time monthly snapshot), and CMS 4 (participatory review), EEP/Shiree quarterly and annual reports, and Independent Assessment Panel (IAP) selection report. External documents reviewed are listed in the reference section. Key documents around the themes of indigenous adivasis community, medicinal plants in Bangladesh and sustainable livelihood issues in the Chittagong Hills Tracts (CHT) were reviewed to further understand the context of remote indigenous communities living in the CHT region.

2. Initial Field Trip and Stakeholder Interviews

The first field trip took place on 22nd June 2014 and an FGD was conducted with 7 beneficiaries in Ujibhitor village (a Marma community) in Bandarban. ECo-Development Executive Director, Project Manager and M&E officer presented an update on the project progress and self-review learning. Observations were debriefed with the project team above and field report was shared.

3. Second Field Trip, KIIs, FGDs and Reflection session with Project Team

The second field trip took place from 24th – 26th September 2014 and covers 3 FGDs purposively selected in Rowangchhari, Naikhongchhari and Ali Kadam Upazilas (all Marma communities) with 90% beneficiaries households (BHHs) coverage. The BHHs have been purposively selected based on several common indicators in CMS 2, such as income, government safety nets, assets and confidence about the future. Each FGD took two to three hours and was conducted by: EEP/Shiree Senior Programme Manager and Associate Programme Manager, translated by a non-EEP/Shiree project member. Selected KIIs have been conducted with the UP Chairman from Nowa Paton Union (Rowangchhari), Agriculture officer from Department of Agriculture Extension (DAE) and one of the bigger buyers of Kalmegh medicinal plant in Paduwa market. A Reflection Session with ECo-Development project team was conducted on the 24th September 2014 with the Executive Director, Project Manager, M&E Officer, Marketing and Purchasing Officer, Accountant and three Community Facilitators.

4. Formal Surveys – Endline to Baseline Survey

Both baseline and endline survey were conducted to collect standardised and comparable information from 64 randomly selected households. The endline survey seeks to establish the efficiency and effectiveness of these innovation modalities in uplifting people from extreme poverty by comparing and assessing the socio-economic changes of the project beneficiaries towards the end of the intervention with their condition before beginning project activities.

Data collection & Method: The baseline survey used a multi-module questionnaire on household socio-economic conditions, including assets, expenditure, income, loans/savings, food security and empowerment. The endline survey questionnaire contains additional modules specific to the innovation. Field work for the baseline survey was conducted in February - April 2012 and the endline survey was conducted in September 2014. Field teams at baseline comprised of eight field organizer and data was checked by four project staff, and at endline the field team consisted of six trained enumerators, two research associates from EEP/Shiree scale fund projects as auditors and the process was monitored by two Monitoring and Evaluation (M&E) staff of EEP/Shiree CMS unit. Data for both surveys was collected using paper based pre-tested questionnaires. Data entry for the baseline was done by project staff using online database developed by EEP/Shiree, while endline data entry was done by one research associate from scale fund NGO with oversight from CMS unit.

Sample: The baseline survey was conducted for all beneficiaries before beginning project activities, totalling 750 BHHs. The endline survey was conducted on a random sample of 64 households using cluster stratified sampling by location (district to village and para level).

Graduation from extreme poverty (Annex 6) is based on an index of multi-dimensional socio-economic indicators from which a household is deemed 'graduated' if one meets a set number of indicators (which differs according to rural and urban settings). The index is primarily used to ascertain the intervention impact and shortcomings, monitor sustainability or resilience and give a practical meaning to the concept of extreme poverty eradication as 100% graduation.

Limitations of this report:

- No economic and environmental analysis was performed on the impact of medicinal plants cultivation versus jhum cultivation.
- Endline sample was not stratified by year one and year two nor by male and female headed households split.
- Endline data may contain seasonal variations, for example: August is the harvest season of chillies, maize, leafy vegetable, cucumber from the jhum field and September (endline) was the harvest season of jhum paddy.
- The split of income between agriculture and medicinal plants cannot be obtained from the endline survey as the survey asked for BHHs income in the 'previous month' when there was no income in the last month from medicinal plants. Therefore, extrapolation of monthly income for yearly income will not be a fair representation.
- Any significant differences between baseline and endline cannot be attributed entirely to the project, unless we assume that the project was the only factor influencing any changes in key indicators over time, which is highly unlikely.

1.4. Format of the Lesson Learning Report (LLR)

A similar process has been followed during the preparation of each IF Round Four LLR. The report is presented in five sections. **Section One** provides a background on the purpose and methodology of the report. **Section Two** gives a brief introduction to the project context and content, the main innovation, theory of change and Strength Weaknesses Opportunities Threats (SWOT) analysis. **Section Three** details the findings against Development Co-operation Directorate (DAC) evaluation principles of relevance, appropriateness, effectiveness, efficiency and sustainability. **Section Four** concludes the findings on performance and lessons learned on

the innovation. **Section Five** provide recommendations for different stakeholders. In all cases the report has been shared with the concerned NGO, feedback has been received and appropriate adjustments made.

1.5. Lesson Learning Team

The Lesson Learning Team consisted of Sutapa Paul (Senior Programmes Manager, EEP/Shiree) who assisted the second field visit, Masud Rana (Senior Programmes Manager, EEP/Shiree) as programme manager in charge, Evelyn Wonosaputra (Associate Programmes Manager, EEP/Shiree) as report writer, and Abdul Jabber Jufry (Senior Monitoring and Evaluation manager, EEP/Shiree) who was responsible for the endline survey data collection and analysis. EEP/Shiree Lesson Learning Team is thankful for the all round support provided by Aungsathwi Marma (Executive Director, ECo-Development), Thun Hla Khine (Project Manager, ECo-Development) and all of ECo-Development/EEP/Shiree team members.

Section 2 Introduction to Project Context and Content

2.1. Context

The Chittagong Hill Tracts (CHT) is home to eleven indigenous groups with their own language, religion and culture. The uneven hilly terrains, remoteness of the villages and political instability have seriously impacted the economic development of the region. Illiteracy, little education (only eight percent of CHT people completed primary education (CHTDF 2009)), high rate morbidity and health shocks are common among the indigenous people (*Jumiyas*).

The extreme poor living in the CHT region have traditionally solely depended on jhum or shifting cultivation for their livelihoods. Jhum cultivation is where the hill land, allocated by a headman[1], is cultivated on a rotational basis through the process of slashing and burning. This process is labour intensive as it requires slashing, land preparation, sowing, weeding and harvesting. In the last few decades, the yield production and soil fertility have been severely affected due to repeated use of the land within short fallow period of three to five years[2]. This high dependence of Jhum cultivation for the extreme poor families meant that they are prone to food insecurities for many months in a year, particularly in the Bangla calendar month of *Asharh* (June-July) and *Shrabon* (July-Aug).

Existing health facilities in the CHT region are inadequate and the extreme poor do not have timely access to such facilities due to their socio-economic condition and remote locations. Due to this reason, there is a noticeable shift over last two decades. The extreme poor now seek after medicinal sellers when they are sick due to distance and affordability, at the high risk of misdiagnoses. They are also shifting away from local healers who often rely on medicinal plants

[1]A Mauza headman has administrative power to access land of up to five acres for jhum cultivation in each family (rules 34(a)(i) of CHT Regulations 1990). The role of a headman in the transfer of land is an ancestral right managed through customary law, and is also implied in CHT Regulation 1990 rules 39 where the District Commissioner needs to consult Chiefs "on important matters affecting the administration of the CHT".

[2] Many studies have found that this changing usage of jhum land, due to population increase, poses risk for sustainable production (Nath, T.K Inoue, M and Chakma, S, 2011:137).

for treatment (EEP/Shiree Working Paper No. 18:11). This ethno-medicinal plants knowledge is depleting at alarming rate in the last two decades and Bangladesh is at risk of total loss of this rich knowledge (Kadir, MF et al. 2014:496).

2.2. Main Innovations

The project Economic Empowerment of Jumiya people through Medicinal Plant Cultivation (EEJMP) aimed to lift 750 indigenous households in Bandarban Hill district out of extreme poverty through the following innovation:

- Commercial cultivation of medicinal plants, particularly Basak, Kalmegh, Ashwagandha, Simul and Turmeric as alternative profitable means of their livelihoods (technical innovation)
- Developing sustainable network and market linkage with medicinal plants' local and national buyers (process innovation)

Bangladesh is rich in traditional medicinal practices due to its heterogeneous ecologic condition such as fertile land and warm climate. However, medicinal plants are being used as a secondary resource and many perceives it not to be a viable livelihood source. The medicinal sector in Bangladesh is worth US$14 million with local supply comprised of 70% of the quantity and 40% of value and that demand is on the rise (Dixie et al. 2003 quoted in Chowdhury, MSH and Koike, M 2010). Careful and sustainable approach of cultivating medicinal plants can create opportunity for local development and can play a significant role in conserving local biodiversity (Guo and Long 1998 quoted in Chowdhury, MSH and Koike, M 2010).

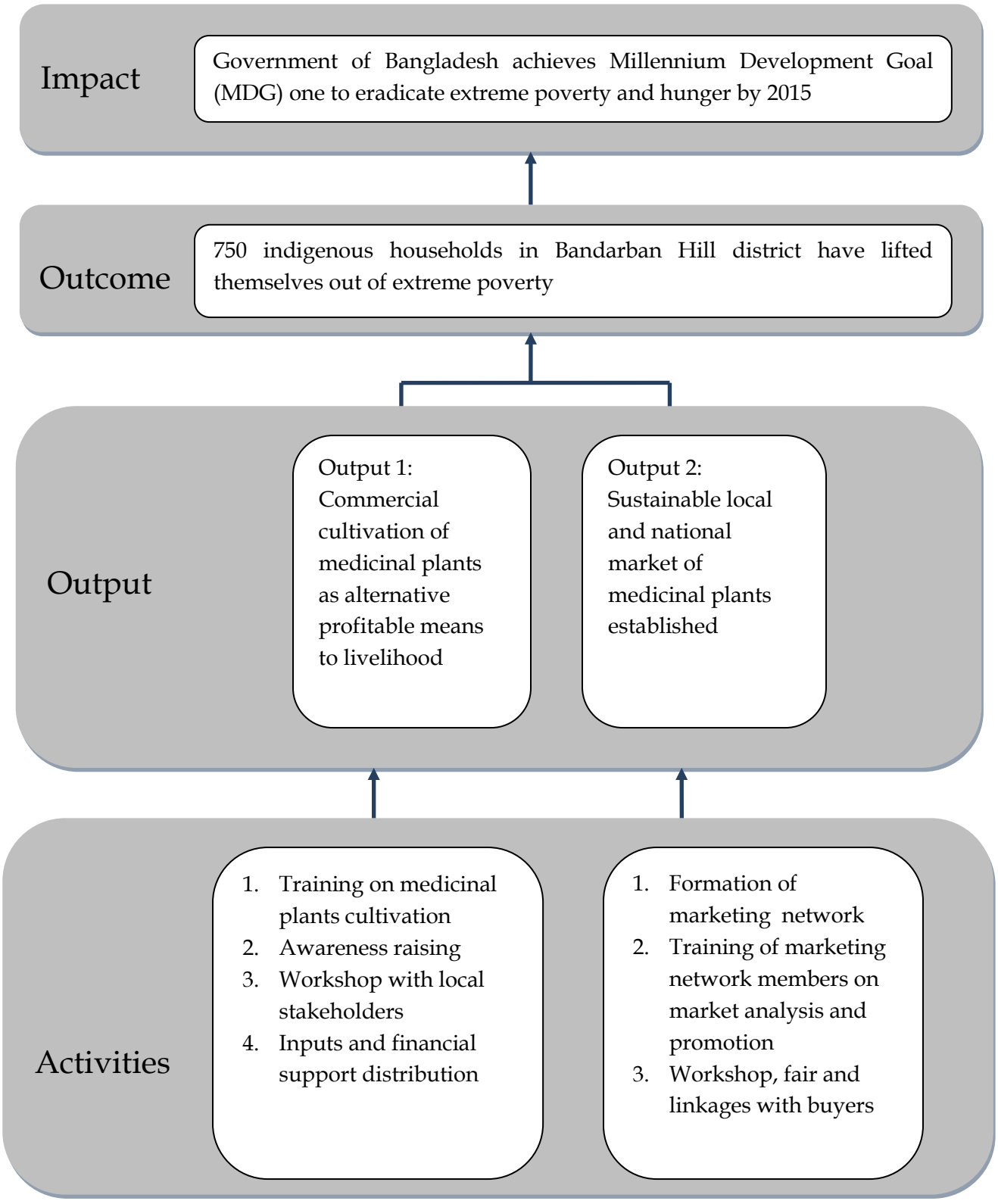
This project is considered an innovation as medicinal cultivation on a commercial scale is not widespread in the CHT region despite the demand due to a variety of reasons including lack of knowledge, skills, technical support, capital and undeveloped market. EEJMP was the first project in the CHT region that promotes medicinal plant cultivation as alternative profitable livelihoods for the extreme poor. ECo-Development has prior experience in medicinal plant cultivation through a pilot sub-project 'Promoting Livelihood through Income and Employment' funded by International Centre for Integrated Mountain Development (ICIMOD) and United Nations Development Programme (UNDP-CHTDF) targeting 400 households in 2008. As a result, ECo-Development has the competitive advantage of an established network with local *Baidyas* (traditional healers) and wholesalers.

The means by which the project implements the innovation involves:

1. Revolving the fund from first year beneficiaries (400 BHHs) to second year beneficiaries (350 BHHs), in cash and kind, from their first and second year harvests[3];
2. Delivering direct delivery to BHHs through a bank account; and
3. Establishing beneficiaries' marketing networks to manage collection of products and communicate with local and national buyers.

[3] Further explanation of the revolving fund model is included in section 2.5.

2.3. Theory of Change



Assumptions: No major external factors (environmental and political disturbance) impacting project implementation

2.4 Strength Weakness Opportunities Threats (SWOT) Analysis

The SWOT analysis below lists the internal and external factors that influence the achievements of the outputs and outcomes of the project.

Internal	**Strengths** • Strong management leadership • First to market: one of the few NGOs[4] engaged in commercial cultivation of medicinal plants • Existing links and partnerships with local *Baidyas* and wholesalers (MOU with Square Pharmaceutical signed in 2010 for Basak and Kalmegh) • National NGO who has been working in the CHT region since 2000	**Weaknesses** • High project staff turnover • Language barrier, illiteracy, weak business acumen and capacity (of beneficiaries) • Market linkage established reinforces dependency on the NGO • Inadequate storage facilities at village and upazila level
External	**Opportunities** • Income diversification • Expansion of commercial cultivation of medicinal plants (e.g. as middle man) • Increased public awareness and support on usage of medicinal plants • Influence policy-making relating to sustainable resource management	**Threats** • Businesses owned by BHHs unable to compete with more powerful market actors • Susceptibility to shocks (health, natural disaster) • Political instability • Lack of infrastructure limiting market access

2.5 Beneficiaries Selection, Asset Delivery, Revolving Fund and Budgeted and Actual Expenditures

Beneficiaries Selection The project targets the extreme poor families in Bandarban district (in four Upazila) who have met the following essential criteria:

- Household income less than BDT 2,500 per month
- Landless or possesses not more than three acres of hilly land
- Productive resources not more than BDT 4,000
- No access to or member of financial networks or Microfinance Institutions (MFIs)
- Have food security for three to four months from jhum cultivation[5]

[4] In other districts, Natore Oshidhi Songhatan (Natore), Pajurico (Khagrachari) and Ashika (Rangamati) are some of the organizations engaged with medicinal plants cultivation.

A Participatory process was undertaken in December 2011 to select BHHs through community's focus groups discussions and meetings with local leaders. Collection of households' data by Community Facilitators (CFs) was then verified by EEP/Shiree. Following the above criteria, 750 beneficiary households (BHHs) selection was made in Bandarban, Rowangchhari, Ali Kadam and Naikhongchhari Upazila of Bandarban district.

Asset Delivery

As each medicinal plant will require up to eight to ten months of cultivation, EEJMP provides short-term support of poultry rearing and vegetable seedlings. Simultaneously, medicinal plants training and monthly awareness raising sessions were provided. Distribution of medicinal plants was provided by ECo-Development through tender process, whilst the vegetables seedlings were purchased through beneficiaries purchasing committee.

A summary of EEJMP's project intervention and asset delivery per beneficiary is as follows:

Asset Delivery	First year beneficiaries	
	Total Unit(s)	Value (BDT)
Basak (sampling)	3000	6,000
Kalmegh (kg)	1	4,000
Ashwagandha (kg)	0.5	2,000
Simul (kg)	1	150
Turmeric (kg)	100	4,000
Maintenance, Jungle cutting, fertilizers, land preparation and transportation		15,000
Total Medicinal Plants Cultivation		**31,150**
Cucumber/Marpa	20g	100
Bean	50g	50
Sweet gourd	50g	100
Brinjal	100g	500
Green chilli	100g	150
Puishak	50g	50
Lady finger	100	50
Banana	60	600
Preservation		1,500
Total Vegetables cultivation		**3,100**
Chickens	10 piece	2,000
Pigeons	10 piece	1,500
Input assistance		1,500
Total Poultries rearing		**5,000**
	Total	**39,250**

Figure 1: Asset delivery per beneficiary

[5] Food security in the hill tracts is defined to have two meals in a day and consumption of meat or fish at least once a week.

Revolving Fund Model

The Revolving Fund model was chosen to cover more BHHs as return on investments from the first year BHHs (400 BHHs) will be revolved to cover asset delivery for second year BHHs (350 BHHs). ECo-Development will be responsible for the management of the revolving fund.

The Revolving Fund model in EEJMP project is as follows:

- Each of the first year BHHs receive medicinal plants cultivation from ECo-Development worth BDT 31,150. On top of these, they also received vegetables cultivation (BDT 3,100) and poultries (BDT 5,000) as short-term support (Figure 1).
- At the end of the year (first harvest), first year BHHs (400 BHHs) return 75% of the investment they received from the project in cash and/or kind (for example, cash from their savings, labour, seeds and cuttings) to the second year beneficiaries (350 BHHs), equivalent to BDT 29,437.
- The remaining 25% of the investment, equivalent to BDT 9,813, will need to be provided to the second year BHHs from first year BHHs at second harvest.
- Each of the first year BHHs will deposit 20% of their first year profits as savings into a nominated bank account as a requirement (to encourage savings so that they would have adequate funds for second year BHHs). This figure is based on the amount of sales from asset provided by the project, including medicinal plants, vegetables and poultries.
- The second year BHHs will be, where possible, selected within the same village of first year BHHs by ECo-Development (using the same selection criteria) and verified by EEP/Shiree.
- Second year BHHs do not have to refund their investment.

Budgeted and actual expenditure

The three years operation was budgeted to cost BDT 34,669,960 with 75% to be spent for direct and indirect (i.e. training) benefits for BHHs (and 25% for administration, human resources and management costs). The actual cost came to BDT 34,745,246 with 48% of the cost spent for direct and indirect benefits for BHHs. The major variance is due to:

- The number of BHHs was increased from 400 to 750, but at a lower cost per BHH than originally budgeted. The lower cost was driven by: the revolving fund model, reduction in nursery costs, and inclusion of short-term intervention such as poultries and vegetables gardening support instead of power pump and deep tube well.
- BDT 4 million was attributed to management intern international salary as agreed with EEP/Shiree, and additional M&E staff, research officers and doubling of CFs from four to eight people.

Detail of financial overview can be found in Annex 2.

Section 3 Findings against Evaluation Criteria

3.1. Relevance

Relevance is concerned with assessing whether the project is in line with national and local priorities and refers to the overall outcomes and impacts.

The project meets Government of Bangladesh (GoB)'s commitment to Millennium Development Goal (MDG) target one and GoB's commitment (Budget Speech 2014-15) to eliminate extreme poverty by 2018 (Muhith, AMA 2014:33). This project supports EEP/Shiree mandate to lift one million people living in extreme poverty in Bangladesh who are facing unique geographical, economic, political and social context[6]. EEJMP project is directly targeting the indigenous communities of Bangladesh and broadly aligns with the goals of Peace Accord agreement in 1997 that recognises the distinct ethnicity and special status of the tribes and indigenous people of the CHT. The signing of CHT Peace Accord was considered a milestone to stop the decades of political conflict, violence, and exploitation of the indigenous people (Jumiya) or frequently identified as Adivasi (original inhabitant) and to facilitate socio-economic development.

The CHT area is susceptible to climate changes as the overall temperatures have been increasing over the past ten years. Land-based livelihood strategies are being impacted due to poor land fertility, lack of water supply for irrigation, and heavy rain during monsoon season. Jhum cultivation is becoming an unsustainable livelihood means as the fallow period is reduced to 3-5 years[7]. This is an insufficient period as nothing is being done to improve the nutritional status of the degraded land. Therefore, finding alternatives to shifting jhum cultivation that can provide sustainable livelihoods to lift the extreme poor out of poverty, when done in a large scale, can have a groundbreaking positive impact in the CHT region.

3.2. Appropriateness

Appropriateness considers cultural acceptance and feasibility of activities or method of delivery and evaluates whether the project design and implementation is acceptable and feasible within the local context.

The medicinal plant cultivation as an *alternative*[8] source of income was well accepted by the beneficiaries, communities and local government representatives despite the initial reservation as to how these plants can be cultivated and marketed. BHHs in Naikhongchhari interviewed explained that EEJMP project team cleared their initial reservation through detailed explanation from the beginning of the project, whilst for others; they were already familiar with the long tradition of indigenous herbal medicaments. In the first stakeholder workshop conducted in

[6] The project has gone through a rigorous selection process by the Independent Assessment Panel (IAP) in the Innovation Fund Round Four of EEP/Shiree, including capacity assessment, evaluation of proposals and programme memorandum for recommendation to the National Steering Committee prior to approval and contract signing.

[7] Borggaard, Gafur and Petersen (2003) found that with an estimated output of USD 360 against an input of USD 380 ha/year, jhum cultivation is no longer financially sound. Rasul and Gopal (2006) supports this finding and further add with the average cost of soil nutrient depletion is BDT 7,883 ha/year, which is environmentally unsustainable in the long term.

[8] Indigenous communities in the CHT region have traditionally relied heavily on jhum cultivation as their main source of income for food security.

July 2012, the Divisional Forest Officer and Deputy Director of Agriculture Department, Upazila Nirbahi Officer and Deputy Commissioner also lent their support and were excited about the prospect of medicinal plants cultivation in the region. Bangladesh government institutions have provided training courses and motivational programmes to encourage usage of medicinal plants in the past but have not resulted in activities viable for livelihood due to lack of large-scale buyers (Maniruzzaman, Mahmud and Ahmed 2008:21).

The current State and Non-State effort to increase access and quality of health services in the CHT region[9] is not undermined by this project. This is because thus far, the extreme poor in the CHT district are still relying on self-medication, unqualified medicine sellers, traditional healers and religious charmers as their first point of contact for health issues due to inaccessibility and poor health facilities (Shiree Working Paper 18).

There was, however, little consultation with BHHs at design, inception and implementation stages as to the *model* of intervention. Each beneficiary for year one and year two was given the same selection of medicinal plants; this is despite the learning from year one production that some medicinal plants are less suitable in the CHT region (Annex 4). EEJMP project continues to provide the same level of intervention for year two BHHs, which was driven by the revolving fund model included in the project design. Furthermore, the design of the project meant that BHHs did not have the option to choose their own Income Generating Activities (IGAs) and the means in which the intervention was delivered.

Gender

The project had not considered gender aspect both at project design and implementation stages despite the original proposal submitted to IAP assuring women's participation and empowerment. Notwithstanding the common perception that adivasi women are more empowered, this is often mistaken for their mobility[10]. EEJMP had (only) 6% of its main beneficiaries as women[11] and women's empowerment indicator used in the graduation index (Annex 6) shows a marginal improvement to 41% from 15% at baseline[12]. Although endline shows that 60-80% of women have major decision-making power over a range of issues such as children education and everyday expenditures, 10-13% says they still have small decision-making power on purchase or sale of land and on buying or selling of large assets. Unuching (CMS 5) reiterates the importance of decision-making power "I have gained a lot of experience since the intervention of the project, notably working as treasurer at the medicinal plant cultivator groups, communication, and negotiation with buyers, which was very important for me." The marketing network group has 27 members; all of whom are male. EEJMP project

[9] For example, UNDP CHTDF project works with the GoB to increase coverage of satellite clinics, increasing the network of Community Health Services Workers and increasing the quality of Community Health Services.

[10] Women are heavily engaged in jhum cultivation, collecting woods and other necessities from the forest, wholly responsible for household activities and maintaining the homestead medicinal plantations in the locality (Khan and Rashid 2006:41). These activities significantly increased women's burden but is not often translated to decision-making power (Dhali 2008).

[11] Findings from EEP/Shiree programme indicate that giving ownership of assets to women often leads to an increase in their decision-making power and overall empowerment.

[12] Note that this indicator is based on 12 questions at baseline and 18 questions at endline, only 4 of which are comparable (for example, influence on purchase of land is asked at endline but not baseline).

could have empowered more women if the innovation had been more female-friendly with a focus to increase their confidence and by encouraging women's ownership of the IGAs to increase their decision-making power within the households and in the community

Environment

ECo-Development has not considered in the design, implementation and particularly M&E of the EEJMP project to evaluate whether there are any positive or negative environmental impacts of medicinal plants in the CHT region, particularly the impact of medicinal plants on land degradation versus jhum cultivation.[13] No publicity materials, economic and environmental analysis have been incorporated in any stages of the project. Evidence-based analysis on the environmental impact of medicinal plants cultivation, as part of the project design, could have an advantage to more strongly influence policy making.

Disaster Risk Reduction

The project did not appropriately consider the high risk of natural disasters in the local area at design and implementation stage. The heavy rainfall, flash floods, soil erosion and landslide had affected almost all of EEJMP's first year BHHs in 2012. 75 BHHs had between 40 to 80% of their plots damaged in Ali Kadam and Naikhongchhari upazila of Bandarban. Despite the initial success of germination rate of the medicinal plants, the heavy rainfall and surface runoff and erosion caused Simul, Ashwagandha and Kalmegh and other crops such as vegetables and banana to be destroyed. The project design included a contingency plan as part of its risk reduction strategy which was not available at the time of the incidence. After a series of discussions with EEP/Shiree, approximately BDT 600,000 was spent for additional winter vegetables, Ashwagandha and Kalmegh inputs, for those beneficiaries whose plots were affected. The high number of natural disaster events in certain areas of the CHT region highlights the susceptibility of losing gains made by the extreme poor.

3.3. Effectiveness

Effectiveness measures the extent to which the project or activities achieve their purpose, or whether this can be expected to happen on the basis of the outputs.

Output 1: Commercial cultivation of medicinal plants as alternative profitable means to livelihood

EEJMP project has, to a certain degree, been effective in terms of introducing medicinal plants commercial cultivation in the CHT region as alternative source of income to jhum cultivation. Providing alternative sources of income through medicinal plants allows extreme poor households to reinvest their income to cultivate other crops such as vegetables and/or rice in leased lands. Endline survey shows that in spite of the fact that majority of BHHs are still relying on jhum cultivation by the end of the project, there has been a significant decrease in the proportion of households head relying solely on jhum cultivation from 98% to 75% at the end of

[13] Shifting jhum cultivation in recent years has degraded land productivity, causes forest product impoverishment, flash floods and affects drainage condition in rivers and deep basins (Rahman, Rahman, Sunderland 2012:151). 17% of soil resources in the hill districts have deteriorated between 1964 and 1985, and topsoil erosion ranges from 100 to 120 tons per ha annually (Farid et. al. quoted in Ministry of Environment & Forest 2001:31).

the project. Discussions with BHHs in the focus groups indicate that BHHs prefer other alternatives to jhum cultivation because it is time consuming and labour intensive, with a negative impact on the well being of the children as parents return from the jhum field very late at night. This is a positive shift given that tradition and custom is still the main driver of farmer's choice in jhum cultivation (Rahman, Rahman and Sunderland 2012:153).

Output 2: Sustainable local and national market of medicinal plants established

The extent to which EEJMP was able to establish linkages with local and national medicinal plant buyers can be considered somewhat effective, after taking into account the vast challenges involved. Market linkage is also one of the main reasons why previous GoB's programmes have failed to result in viable livelihood. During the stakeholder workshops, many of the GoB representatives[14] in their speeches mentioned the importance of market linkages. This is due to the non-existent commercial selling in the CHT region despite the high demand for medicinal plants. By the end of the project, EEJMP managed to facilitate linkages with two local buyers and five national buyers including Hamdard Laboratories and Square Pharmaceutical[15], but fall short of its logframe target of 20 agreements, which increases the risk to the BHHs. Some of the challenges include: the tendency of middlemen to gain profits, difficulties to create permanent buyers particularly for Kalmegh and difficulties to ensure participation from major pharmaceuticals companies in the workshops. EEJMP project team also had some challenges in dealing with many small buyers particularly for products with fluctuating market price such as Kalmegh. Despite these challenges, EEJMP was able to build networks with a few buyers, although much more could have been done given the big market opportunity of medicinal plants in Bangladesh.

The current marketing channel (Figure 2) provides a one-stop shop for buyers to collect products and settle payments. However, this current model relies heavily on ECo-Development's office and project team to manage the marketing side of the value chain. Although this is an effective method while ECo-Development is around, the sustainability of this method is highly questionable. More will be discussed under section 3.6 sustainability.

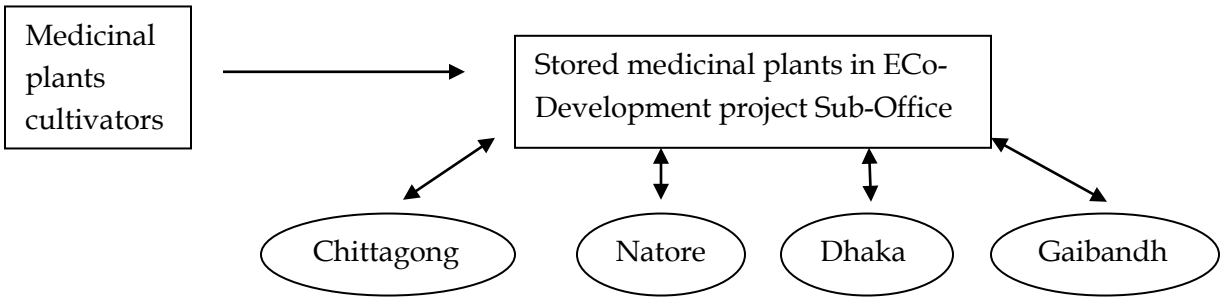


Figure 2: EEJMP's Marketing Channel Source: ECo-Development Annual Report 2013

Progress and achievements against log frame targets can be found in Annex 3.

[14] Agricultural Officer, Upazila Nirbahi Officer in Stakeholder workshop in March 2013 and Divisional Forest Officer, Deputy Director of Agriculture Department, Upazila Nirbahi Officer in Stakeholder workshop in July 2012

[15] The number one pharmaceutical leader in Bangladesh since 1985

3.4. Efficiency

Efficiency measures how economically inputs (funds, expertise, time) have been converted into outputs.

One of the main means to deliver the project innovation was through the revolving fund model, which was found to be efficient regardless of the logistical complexity and initial disinclination by first year BHHs. The average direct delivery cost comes to an average of BDT 21,308 per beneficiary. The revolving fund model allowed EEJMP project to reduce the total cost of direct delivery per beneficiary. The first year BHHs were provided asset delivery equivalent to BDT 39,250 each (Figure 1) and assets delivery for second year BHHs was funded by the first year BHHs. EEJMP, however, had to provide additional funding to second year BHHs due to lower than estimated production yield by first year BHHs due to natural disasters. Budget and actual cost comparison shows that EEJMP needed to provide additional BDT 526,000 for purchase of Kalmegh and Ashwagandha seedlings, which was nonetheless lower than the expected provision of 50 out of 400 beneficiaries or 19 lakh[16]. This allows second year BHHs to receive approximately the same amount of seedlings and cuttings as first year BHHs.

Despite the revolving fund model was able to efficiently deliver the project's intervention, the effectiveness of the model was highly dependent on the management. The revolving fund model was complex to administer and monitor and it poses higher risks to subsequent year BHHs due to natural disasters and/or poor monitoring. For instance, interview with second year BHHs found that cash has not been transferred through a bank account as they did not yet have a bank account at the time of transfer. This poses increased risk as monitoring needs to be done manually by CFs. Documentations have not been sighted by EEP/Shiree on each transfer made by year one BHHs to year two BHHs, therefore it cannot be said for certain, despite the claim made by the project team, that second year BHHs did receive exactly the same amount of asset transfers as the first year BHHs.

A closer look to the socio-economic well-being of first and second year BHHs at the end of the project shows a surprisingly noticeable difference. Comparison between endline and baseline shows that first year BHHs have gained BDT 10,667 improvements in income, whilst second year BHHs had a lower increase at BDT 8,035. Even more alarmingly, in terms of assets, first year BHHs had increased their assets value by BDT 216,623, whilst the second year BHHs had a much lower increase at BDT 97,689. Graduation rate between first and second year BHHs also differs significantly (91% for first year and 76% for second year beneficiaries). Graduation details are included in Section 3.5. This finding was supported by interviews with second year BHHs at FGDs who self-define themselves to be at a lower step (*shiree*) than first year BHHs in terms of their progress out of extreme poverty. They reiterated the fact that the project was "too little of a time but we believe if we continue in the long term and work hard we will be continue to do better". In this aspect, the revolving fund model in EEJMP project does raise a question on whether the efficiency gain from a revolving fund justify the fact that it leaves second year BHHs lesser time within the project to graduate out of extreme poverty.

[16] BDT 19,000,000

Value for money

One way to consider efficiency is to look at it as part of Value for Money (VfM), which is about maximizing the impact on each pound spent. It is important to note that the concept of value for money goes over and beyond efficiency: "it is about getting the right balance between three things – economy, efficiency and effectiveness – and it needs to be assessed as a whole" (Jackson 2012). Selected EEP/Shiree VfM indicators have been utilised below to evaluate whether EEJMP project has a good value for money for funders.

EEP/Shiree Value for money indicators - EEJMP	
Fees to Total Expenditure	4%
Cost per beneficiary	BDT 46,326 or £393
Direct Delivery Percentage	46%
Number of BHHs per field worker	94
BHH Direct Delivery Spend	BDT 21,308
Cost per graduate	BDT 52,945

Figure 3: EEP/Shiree Value for money indicators – EEJMP project

EEJMP project, as part of the Innovation Fund Rounds, has a smaller scale budget by comparison to Scale Fund projects. EEP/Shiree worked closely with EEJMP project from the beginning to set and revise budgets on a yearly basis. In terms of direct delivery, EEJMP faired lower than other projects in the Innovation Fund Round Four (ranging 51% - 69%); however, at the bidding stage there was no requirement that the direct deliver has to be 50% and above[17]. Nonetheless, if indirect delivery (awareness raising meeting and training) was included and international management intern expenditure was excluded, the percentage would go up to 55%, which would be a fairer comparison for EEJMP project. The total cost per beneficiary at £393 is still higher than the average contract (not actual) cost of Innovation Fund Round Four at £323.

Human Resources

Considering the remoteness of the CHT region, ECo-Development was able to efficiently utilize their staff members; particularly the CFs. CFs played an integral role in almost every aspect of the project, from conducting the initial assessment, managing the approval process for procurement, providing medicinal plants and other monthly training, CMS 2 monitoring to facilitating access to government safety nets. One of the feedbacks from EEJMP staff members to EEP/Shiree, however, was that staff salaries should commensurate with workload. This indicates investment in human resources in the EEJMP project was not adequate. EEJMP project also has a very high staff turnover which impeded project implementation.

[17] Two of the VfM indicators used for scoring in the scaling out of additional 48,800 households in September 2013 was a unit cost of **£200 per** beneficiary household and **50%** of the budget spending is for **direct delivery** to BHHs (Internal report *Review of NGO Applications for further Scaling Out to 48,000 Households for the EEP/Shiree Project* 30th September 2013 by David Smith). However, the 50% direct delivery benchmark was meant especially for the scale funds projects with the inclusion of nutrition and additional BHHs. Moreover, the cost per beneficiary household cannot be compared with scale fund projects as overhead cost would be spread across a much higher number of BHHs.

3.5. Impact

Impact refers to measured changes in human development and people's well-being brought by the project, indirectly or directly, intended or unintended.

Beneficiaries interviewed in the FGDs mainly attributed changes in their life to increase in income and economic empowerment leading to their ability to reinvest in other productive assets such as livestock. Children are now going to school and improved hygiene and water practices helped reduce health problems. As Aung Ching's wife (CMS 5) said "we both worked hard to cultivate medicinal and vegetables along with traditional crops. The project support helped us to increase our income opportunities to buy more food and educate our children."

Case Study of Redase Marma (39)

Mr Redase received support from EEJMP project in 2012 (second year beneficiary). Prior to joining the project, he lives in a dilapidated house with his wife and son in Bandarban sadar union. He was hardly able to maintain his family expenditures from his income working as day labourer in the jhum field. He had no productive assets. Within a few months of receiving support from EEJMP project, he started selling 1200 kg worth of cucumber, bean, lady's fingers and brinjal and BDT 64,000 worth of Kalmegh, Simul, Turmeric and Basak from his jhum field. The number of chicken has increased to 48 from 8. He had consumed 10 chickens and sold 27kg worth BDT 12,000. The project helped him to open a bank account with Grameen bank and he has saved BDT 35,000 to date. In his leisure time, he retails local products at Megla Parjaton area as another source of income. He explained that he is no longer an extreme poor and wish to see his child be an educated person who can help him and his wife in old age. His son is now studying in class two.

Figure 4: Case study of Redase Marma, a second year beneficiary

Graduation Analysis

EEP/Shiree graduation index uses multi-dimensional socio-economic indicators from which a household is deemed 'graduated' if it meets a set number of indicators (Annex 6). Based on this index, 87.5% of BHHs have graduated from extreme poverty at the end of the project period (Figure 5).

Graduation Criteria	**Baseline %**			**Endline %**		
	Year 1	Year 2	Overall	Year 1	Year 2	Overall
Essential Criteria						
Food Coping (<2)=1, (>=2)=0	100	100	100	100	100	100
Supplementary Criteria						
PPPD Income (Cash+Kind) (Inflation adjusted- baseline 30.5 & endline 35.5 taka)	6	18	9	98	88	95
Number of jobs (>=2)	85	100	89	100	100	100
Cash savings (>=1000 taka)	0	0	0	89	71	84
Productive asset (>=10000 taka)	0	0	0	94	88	92

Graduation Criteria	Baseline %			Endline %		
Non-Productive asset number (>=4)	0	0	0	30	23	28
Food diversity (>=5)	0	12	3	74	53	69
Women & Social Empowerment (>=75% female answering positively)	13	18	15	43	35	41
Sources of safe water	40	41	41	51	41	48
Sanitary latrine	13	0	9	45	29	41
Access to any land	100	100	100	100	100	100
Graduation (Essential 1+ Supplementary 6)	**0**	**0**	**0**	**91.5**	**76.5**	**87.5**

Figure 5: EEJMP's graduation rate based on EEP/Shiree Multidimensional Graduation Index

Assets

There is a significant increase in the mean value of assets (both productive and non-productive) to BDT 188,002 (standard deviations for all of the measures outstanding) per household from BDT 2,971 at baseline (Figure 6). However, BDT 146,550 at endline falls under "other productive assets" of working equipment, which includes trees, turmeric, and ginger among others. There is also a significant difference in assets ownership value between male and female headed households with female headed households owning BDT 81,492 less at endline[18] (Figure 6).

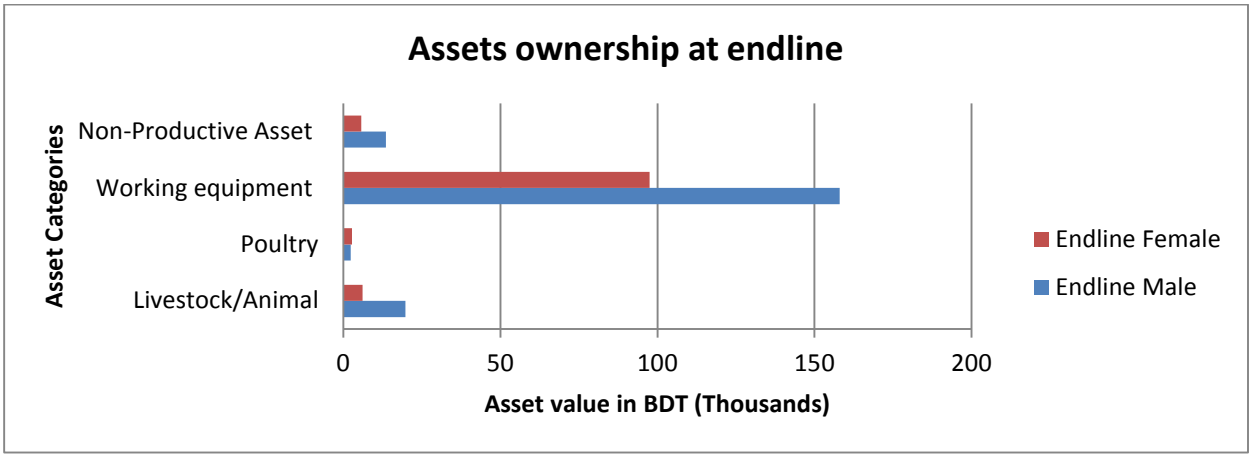


Figure 6: Asset ownership for male headed households and female headed households at Endline

Income

The monthly average mean income (cash and in-kind) per household has increased to BDT 12,135 at endline from BDT 2,167. This is above the national rural income of BDT 9,648 (Bangladesh Bureau of Statistics 2010:28). The extreme poverty threshold was defined based on income data from the Household Income and Expenditure Survey (HIES) 2010 report corresponding to the lowest 10%, calculated separately for urban and rural areas in taka per person per day (pppd). Taking into account annual inflation rates, the extreme poverty line was

[18] A similar trend is observed in other EEP/Shiree programme. CMS 3 survey 9 in March 2014 found that total assets (excluding shops) for female headed households were lower by BDT 6,064 and (including shops) by BDT 9,777 (Mascie-Taylor and Goto 2014:64)

30.5 BDT/pp/pd at baseline in 2012 and 35.5 BDT/pp/pd at endline in 2014. Based solely on this measure, 95% of households have crossed over the extreme poverty line, while 5% of households remain below. Similar trend with assets difference was found between male and female headed household with female headed household earning BDT41/pp/pd less[19] as seen in Table 7 below. While there was a gap between male and female headed households at baseline, the gap has widened at endline.

Income sources	**Baseline (BDT)**			**Endline (BDT)**		
	Male	Female	Total	Male	Female	Total
Income/household /month	2,179	2,042	2,168	12,345	10,105	12,135
Income/persons/month	562	677	573	2,966	4,205	3,082
Income/person/day	19	23	19	99	140	103

Figure 7: Income at baseline and endline split between male and female headed households

Expenditure

Average monthly expenditure per household has increased to BDT 10,119 from BDT 2,240 at baseline, slightly above the national rural expenditure per household of BDT 9,612 (Bangladesh Bureau of Statistics 2010:34). The main changes in expenditures were driven by food consumption, health and livestock rearing.

Food security

Due to the timing of when both baseline and endline surveys were conducted (i.e. at harvest and post-harvest time), none of the households reported facing any food coping strategy[20]. In terms of food diversity, 69% of households at endline consumed food from five or more food groups (fish fresh and dried, meat & poultry, pulse, vegetable, fruit, milk, and egg) at least once in the last week compared to 31% at baseline. Households are increasing their dietary diversity by eating more eggs (8% to 78%), milk (0% to 16%), meat (9% to 37%), pulse (30% to 92%) and fruit (16% to 83%). In contrast to assets and income, there is no significant difference between male and female headed households in terms of food diversity. FGDs with BHHs found that they believe they now have better nutrition as they consume more balance food diversity. Although one of the indicators of EEJMP log frame includes nutritional status such as BMI, anaemia and z-score, there was no means to validate this change.

Household Profile

The mean household size has increased to 4.34 from baseline mean household size of 4.22[21] and per capita house size increased to 79 square feet from 29 square feet at baseline. 69% of households' roof materials are now made of tin, whilst at baseline 64% of households' roof materials were made out of grass/straw/jutestick, which are the most common materials used

[19] CMS 3 survey 9 found that when both cash and kind income is included, there is minimal difference between female and male averaging 63.4/pp/pd (Mascie-Taylor and Goto 2014:70)

[20] At baseline this is because food security for three to four months from jhum cultivation is one of the beneficiary selection criteria.

[21]This is consistent with research across EEP/Shiree programme which shows that economic empowerment may lead to a 're-combination of families' that had become fragmented through severe traumatic poverty.

by the indigenous community in the CHT (CHTDF 2009:68). Considerable changes were found on access to electricity with 22% of households now have access to electricity (zero at baseline). Positive shift in defecation practice was also observed, with 41% of households now defecates in improved sanitation practices[22] where 91% used to defecate in the open at baseline. Only marginal increase was observed with regards to BHHs' access to improved sources to drinking-water[23] to 48% from 41% at baseline. CMS 2 showed that 40% of households took more than 30 minutes for water collection. Access to improved sources to drinking-water is one of the major challenges across the CHT region, which has a much lower access than the national rural figure of 95% (Bangladesh Bureau of Statistics 2010:22).

3.6. Sustainability

Sustainability assesses the likelihood of benefits to continue after funding has been withdrawn. The list of key resilience indicators which form the Innovation Fund Round Four' sustainability theme is included in Annex 5.

Income diversification

This diversification of income sources is a strong indicator of resilience as it increases the chance of BHHs to protect their gain[24]. At the end of the project, BHHs were able to hold a more stable income as 97% of households head now say that they are self-employed, whereby the same percentage of households were employed by others as irregular paid worker at baseline. More than 70% of households now have three or more sources of income, which was 20% at baseline. Beneficiaries interviewed in Rowangchhari indicated their preference to continue production of medicinal plants so that they would be able earn more income to lease more land for rice cultivation and livestock rearing.

Savings and access to loans

Savings and access to loans are two of the important indicators of BHHs' ability to protect their gains. Matin et al (2002) and Rutherford (2000) quoted in Jackman, Chowdhury and Chowdhury (2013) note down the reasons the poor saves: life-cycle needs, emergencies, opportunities and consumption smoothing. At endline, 91% of BHHs now save with an average savings amount of BDT 13,783 (50% of households surveyed have savings between BDT 1,001 – 10,000), which is much higher than the average indigenous households savings in the CHT region of BDT 2,647 (CHTDF 2009:101). Households save in a variety of places, mostly with themselves (57%), in a bank (40%) and NGOs (35%), with 35% of households saving in more than one place. While there has been an increase in cash savings, it is uncertain whether this is adequate to shift use away from sub-optimal coping strategies to deal with shocks.

The ability of BHHs to have access to financial services indicates a shift away from borrowing informally at exorbitant interest rates. 37.5% of BHHs had a loan at endline where it was 0% at

[22] As defined by Joint Monitoring Programme of UNICEF and WHO, it includes pit latrine with slab.
[23] As defined by Joint Monitoring Programme of UNICEF and WHO, it includes piped water into dwelling or yard/plot and tube well.
[24] EEP/Shiree theory of change lists a few indicators to self-sustaining momentum towards permanent graduation, one of which is diversification of income. Other indicators are investment in health and education, accumulation of savings, and increased engagement of families with local elites including government officials and politicians.

baseline. 66% of those who borrowed obtained finance with microfinance institute, CBO, Bank or GoB mainly for IGA purpose with interest rate between 12% - 24%. However, 29% of those who borrowed were borrowing informally at a high interest rate of 53%. Moreover, CMS 2 shows that of those who borrowed, 37.5% use it for health treatment and 37.5% for IGA expansion. These facts (i.e. BHHs were still borrowing for purposes other than productive assets and that 29% of BHHs at endline were borrowing at a high interest rates) indicate that some BHHs are still at risk of losing their gains.

Access to Government Support and Services

One of the sustainability strategies included in EEJMP project memorandum is to ensure effective collaboration between BHHs with local government, government line departments, NGOs and service providers to ensure necessary services are provided even after project phase-out. The experience of EEP/Shiree programme is that a mixed mode of intervention that includes social protection transfers provides the best option for a sustained route out of extreme poverty (Manifesto of the Extreme Poor).

There has been visible progress which shows that more households now have access to safety nets and they are also more confident in demanding essential public services. Endline (Figure 8) shows that 53% of BHHs are now receiving some type of safety nets, up from 2% at baseline and is above the 2010 rural level of 30% (Bangladesh Bureau of Statistics 2010:129). CMS 2 supports a similar finding showing 54% are now enrolled in safety nets but only 25% are enrolled and **receiving.** Aung Ching (CMS 5) said he had built a strong relationship with political leaders in the village that enable him access to government safety nets. Majority of BHHs interviewed in FGDs were also confident to raise issues to UP Chairmen.

Type of Safety Nets	Baseline	Endline
	%	%
Not Receiving	98	47
Cash for Education	2	30
Old Age Allowance	-	6
Disable Allowance	-	3
VGD	-	14
At least one safety net	-	45
Two safety net	-	8

Figure 8: Access to safety nets

EEJMP also facilitated linkage with Department of Agricultural Extension (DAE) whose mission is to provide extension services to all categories of farmers to promote sustainable agricultural and socio-economic development[25]. One group interviewed has attended the Krishi Mela (farmers' demonstration) at upazila level, while others have not. Only a few BHHs have access to Krishi card which entitle them access to bank loan but in reality access to loan often depends on farmers (and NGOs) relationship with DAE. Political unrest is also causing mobility issues hampering BHHs mobility to obtain income. Aung Ching (CMS 5) said that during political

[25] DAE mandate to service only farmers owning more than 1.5 acres of land will leave many extreme poor outside of the programme.

protest or hartal, she received lower price for her vegetable cultivation and had to throw away some as she had been unable to sell in the market.

The extent to which local governments can provide full coverage of social protection and support to the extreme poor is lamentably limited. Interview with UP Chairman in Rowangchhari upazila highlights some of the critical challenges that local governments face in providing sufficient support to the extreme poor despite good intentions. Some of the challenges include insufficient funding from the central government despite a bottom-up budget submitted based on the local needs, allotment of budget is not transparent and that revenue allocated to the hill is often lesser by proportion to allotment to the plain land, limited funding from local tax revenue, and lack of human resources capacity (and compensation) to perform activities currently done by NGOs. These challenges require a longer term institutional changes and reform of the public service.

Market development of medicinal plants

The importance of capacity building of BHHs and marketing network has not been given the attention it required in the project implementation. EEJMP project design listed some of the marketing networks' role to include evaluating the price of medicinal plants, market analysis and liaison with buyers. The logframe also lists out a target of five marketing networks to be established within the project period. At the end of the project; however, there was only one marketing network and the ability of this group to independently lead the marketing strategy and activities for all of the 750 BHHs in the long-run is improbable. EEJMP has not focused on developing the capacity of the marketing network to manage value chain beyond production, quality sorting, storage and collection of products. Interview with a proprietor in Paduwa market found that transportation and payment have been wholly managed by EEJMP project team and no dealing has ever been made with the marketing network. Although EEP/Shiree observation suggests that language barrier is still a major challenge in building effective market linkage in the CHT region, interview with BHHs found that they have the confidence to deal with buyers directly, as they have dealt with other crops' buyers. This lack of marketing network capacity has a flow on effect to the other BHHs. Monthly EEJMP reports to EEP/Shiree indicate that communication between the marketing network and other BHHs needed to be improved.

Although not all beneficiaries have the same selling means, those that relied on the project office for storage and collection had a noteworthy concern regarding the future and reiterated that "we will abandon the medicinal cultivation if we cannot find ways to sell." The sustainability of the market channel is further compromised due to the lack of accessible storage or collection points' infrastructure that can be managed by the marketing network or BHHs independently after the project ends.

Resource centre

The Bandarban medicinal plant resources centre or nursery (from previous pilot project in 2008) was closed in early 2012 due to the need for Bandarban Hill District Council (BHDC) to expand their development activities as the land is owned by BHDC. This meant that going forward; there is one less avenue for outreach of medicinal plants and its health awareness. It also limits the extent to which one can obtain good quality raw materials particularly for certain types of seeds/saplings that are not easily accessible in the region. The proposal to IAP had this resource

centre as the one stop shop information service after the project phase out; however, beneficiaries interviewed were not aware of this resource centre, let alone being trained to run the centre.

Land ownership

The project design and implementation has not adequately addressed the key issue of land ownership and has relied on the customary rights each indigenous household has to obtain access to two acre (out of the five acre)[26] of lands from their respective Mouza headman. Land ownership is becoming more and more important in the CHT region as shifting jhum cultivation is no longer a financially and environmentally sustainable option. However, discussion with farmers revealed that in spite of being aware of the higher return from for example, agroforestry, it takes a relatively long period of time to provide return and farmers are reluctant to make such an investment when they do not have secure land use rights (Rasul and Thapa 2006:41). The endline shows that none of the BHHs owned homestead or cultivable land at the end of the project. Aung Ching said on land access: "if we have permanent land title for cultivating long-term fruits species and have greater access to traditional land for cultivation of jhum crops then we would gradually move out of poverty" (CMS 5). Many indigenous people are still deprived of their ownership rights over land as only some received *bandobasti* (land ownership) before these were suspended.

It has been observed that certain types of medicinal plants cultivation (such as Basak) does not affect the fertility of the soil where land can be repeatedly used for years, eliminating the need to shift land every few years. However, as economic and environmental analysis has not been conducted, this report cannot conclude the impact of medicinal plants on land productivity and soil deterioration. Nonetheless, it was observed that some BHHs are moving to temporary land lease and/or share cropping, mortgage or leasing cultivable land (Figure 9). The mean cultivable land used free of charge (which includes jhum cultivation) at endline has declined to 78 decimal from 182 decimal at baseline, while the mean temporary leased land has increased from 29 to 217 decimal at endline. Although BHHs interviewed in the FGDs mentioned they do not have any issue so far with extension of land lease, but as land resource becomes scarce, securing long term access to land will be a major issue in the future that impose a significant risk on the sustainable livelihood of the BHHs.

Land	Baseline (%)	Endline (%)
Homestead Land owned decimal	100	100
Cultivable land owned	0	0
Temporary lease land (homestead/cultivable/water bodies)	13	64
Permanent lease land (homestead/cultivable/water bodies)	8	27
Cultivable land share cropped, mortgage or lease?	33	74
Cultivable land used free of charge	74	61

Figure 9: Land ownership at baseline and endline

[26] 1 decimal is 1/100 acre and 1 acre is 4046.9 square meter

Section 4 Overall Conclusion on Performance and Lessons Learned

4.1. Overall Conclusion

This section provides an overall conclusion based on the interpretation of the above findings.

The main innovation which introduces medicinal plants cultivation on a commercial scale has the potential to be replicated and scaled up as it has proven to be successful in providing an alternative source of income to the extreme poor. Kalmegh and Basak have been found to be particularly suitable to be cultivated in the CHT hill region throughout the year, although Kalmegh has additional challenges such as: price fluctuation and difficulty to secure permanent buyers. Both varieties are easy to cultivate, require little maintenance and water requirements, can be suitably cultivated with other crops and have high market demand. Nonetheless, without economic and environmental analysis of medicinal plants and shifting jhum cultivation, this report cannot conclude that medicinal plants cultivation is a more economically and/or environmentally sustainable alternative livelihood source to jhum cultivation. This innovation is relevant in meeting both MDG target one and seven and it broadly aligns with the purpose of CHT Peace Accords to improve the socio-economic status of the indigenous communities in the CHT.

Endline survey provides quantitative evidence that the socio-economic status of the BHHs has improved and that the project is meeting its logframe targets such as households' income, assets, and expenditures with 87.5% of its BHHs graduating out of extreme poverty based on EEP/Shiree multidimensional index. Nutritional information is however unavailable and the project falls short on empowering women. There is strong evidence that indicates BHHs are now diversifying their income and are more accustomed to save, which are important indicators of resilience to shocks. Interview with BHHs, EEJMP project team, KIIs and EEP/Shiree observations found that BHHs are now more economically empowered and have the confidence to raise issues with government representatives. The wider community is made more aware of the opportunity of medicinal plants cultivation, although the rate of adoption is still fairly low.

In terms of efficiency of the project, despite the high direct delivery cost per BHH, EEJMP is able to reduce the total cost due to the revolving fund model. The model is complex to manage, and require good design, implementation and M&E to ensure that the following year BHHs are given equitable asset delivery and support to graduate out of extreme poverty. There is a significant gap on the socio-economic wellbeing found between first and second year BHHs and therefore it puts into question the effectiveness of the revolving fund model.

EEJMP project has not focused its activities to increase the capacity and leadership of the marketing network so that they are able to confidently market and sell the medicinal plants. Transportation, buyers' relationship building as well as storage were still heavily managed by EEJMP project team at the end of the project. This creates dependency on ECo-Development and threatens the sustainability of the project benefits. There was also a significant cost incurred due to landslides, flash floods and heavy rains, which affected the harvest rate of first year beneficiaries. This highlights the susceptibility of the medicinal plants to natural disaster; BHHs need to have sufficient cash and access to good raw materials to ensure sustainability of the cultivation, and the later is at risk due to the closure of the resource centre.

4.2. Lessons Learned

Organisation for Economic Co-operation and Development (OECD) defines lessons learned as "generalizations based on evaluation experiences with projects, programs or policies that abstract from the specific circumstance to broader situation" (DAC 2010). The following are lessons from EEJMP project that can be used in future context to improve project and programmes when replicated or scaled up.

Lesson 1:

Medicinal plants cultivation is culturally appropriate in the CHT region and can provide a good alternative source of income for the extreme poor when technical knowledge and initial capital is provided. Medicinal plants commercial cultivation has a good market opportunity in Bangladesh but farmers lack the knowledge, skills, technical support, and capital. To encourage commercial medicinal cultivation, these barriers need to be removed along with establishment of linkages with buyers. Picking the right medicinal plants most suitable to be cultivated in the CHT region is critical.

Lesson 2:

Revolving fund model, when structured and managed well at design, implementation and monitoring and evaluation stages, can be a cost-efficient way to deliver the project innovation. It is a complex model but can be scaled up with the premise that the later beneficiaries have an equal opportunity to graduate out of extreme poverty. Inclusion of a sustainability component at project design stage is critical to ensure there is an oversight by the project team or local government representative after the project ends. The model needs to be designed so that there is no element of inequity and monitoring is done rigorously throughout project implementation.

Lesson 3:

1. **The use of group bank accounts as a means to transfer assets reduces transaction costs and the risk of funds being misused.** It has lesser logistical complexity than individual bank accounts while still empowering beneficiaries to purchase their own assets.
2. **Individual bank account opening creates a way for financial inclusion, and as the extreme poor are often thought to be 'unbankable' the process in itself is empowering**. Along with awareness training on the importance of savings, households can become habituated to save, which increases their resilience to shocks.

EEJMP project team believes the use of group bank account worked well as a mean to procure assets as it reduces risk of money mismanagement. It is a more efficient way than assets being procured by the project as it reduces fraud risk and minimises additional cost such as value-added tax. More importantly, it provides more ownership to the BHHs to purchase the assets which is empowering for the extreme poor. The money transfer was managed by each beneficiary through a group mechanism; each group bank account has three beneficiaries' signatories.

In the beginning, EEJMP had some problems in terms of opening an individual bank account due to meticulous requirements[27]. Some beneficiaries also live remotely and visiting a bank could take a day or more. Prior to BHHs withdrawing money and procuring assets, the CFs will need to authorise payments after receiving a weekly letter of demand. This significantly increases the administration workload of the CFs to authorise the transaction and monitor financial expenditure. This mode of asset delivery also imposes additional monitoring for the project team as the 'point of expenditure' is when money leaves BHHs accounts[28]. To reduce this complexity, in consultation with EEP/Shiree, the project team decided to pursue a group bank account which was more appropriate given the challenges faced.

By the end of the project, however, EEJMP successfully opened 618 bank accounts. At endline 40%of households surveyed now have savings in a bank account by comparison to CHT socio-economic baseline at 16% (CHTDF 2009:101). Majority of BHHs do not find any issue with communication/language and appreciated the security of saving their money in a bank account. This financial inclusion in itself is empowering for the extreme poor, this is in spite of some evidence that people stopped saving formally and invest in large assets instead after the end of a project (Montesquiou et al 2014:62).

Lesson 4:

Promoting a technical innovation requires communicating the right message to gain broader support, adoption rate and therefore longer term impact and sustainability. The project has not utilised its network of *baidyas* to promote the usage of medicinal plants as first-point health treatment nor has the medicinal plants cultivation been promoted on the ground of plant diversity, land degradation and climate change (i.e. environmentally sustainable livelihood alternative) to attract wider national and international publication and institutional support.

The extent to which the project had an impact in terms of increasing awareness of medicinal plants' benefits in the CHT region was nominal. Beneficiaries interviewed in the FGDs indicate that only a few of neighbouring community members have asked for the seeds or cuttings and started planting either for commercial purpose or personal usage. The adoption rate is still low and only six ayurvedic doctors have been linked through the project. EEJMP organised medicinal plant fair at district level and farmer field days' demonstration in Rowangchhari and Ali Kadam upazila to increase awareness where many government officials, private sectors and community members attended the events. As a result, ECo-Development received a few awards from the District Administration, Upazila Administration and Agriculture Department for its contribution towards promoting medicinal plant cultivation.

The project design has changed from the original proposal submitted to IAP where it no longer has its activities linked to strengthen healers association or training and sharing sessions to *baidyas* to increase awareness, skills and modernize traditional herbal medicine practice as first-contact health care. This is a big shortcoming as the extreme poor do not have access to modern health care due to cost and/or distance. In addition, there is currently limited formal institutions and limited research[29] on medicinal plants in Bangladesh to nurture and

[27] For instance, the bank imposes deposit of BDT 500 per bank account regulation as a minimum.

[28] This is because ECo-Development records its account on a cash basis.

[29] Despite one of Bangladesh Council of Scientific and Industrial Research (BCSIR)'s research area is medicinal plants, the research outcome is still limited.

disseminate knowledge on medicinal plants (Khan and Rashid 2006:38). EEJMP has not capitalised its *baidyas* network to increase awareness of medicinal plants to a (potentially) larger extent and reduce BHHs cost of misdiagnosis from self-medication or unqualified medicine sellers advice[30].

Lesson 5:

Considerable investment of effort, time and money in building the capacity of beneficiaries and marketing network is fundamental to their ability to sell medicinal plants in the CHT region post the project period. Adequate investment on training is required for BHHs to cultivate good yield production of medicinal plants and to encourage behavioural change over issues such as gender, hygiene and nutrition. There was limited structured capacity building training within the project design and implementation. Despite the one day market training provided, it puts an unrealistic assumption that BHHs, who are mostly illiterate with little or no education, would be able to have sound market and leadership skills without adequate, ongoing support and refresher training.

Apart from the training delivered to BHHs (indirect delivery), the total cost spent on medicinal plants training within this project was small (for instance, BDT 75,000 for external Training of Trainers (ToT)). The CFs provided feedback to EEP/Shiree on the need to increase refresher medicinal plants training to twice a year. For a CF new replacement, knowledge is passed on verbally from another CF and learning is done on the job. There was limited number of visits by medicinal experts throughout the project period due a relatively small number of medicinal plants experts in the CHT region. Given that commercial cultivation of medicinal plants in the CHT region is still a new concept, investment on action research and training to project staff members are likely to benefit BHHs favourably.

What is more noticeable is that the quality of monthly awareness sessions, agriculture, and livestock training has not received adequate attention in the project design and implementation. No training was provided on vegetables cultivation and livestock rearing, except ad-hoc support received from the Department of Livestock Services (DLS), and there was no dedicated EEJMP staff member allocated for agriculture or livestock. The awareness raising meeting, attended by both female and male members of the households is an excellent forum to cover behavioural change issues such as gender, hygiene, children education and nutrition as these issues pertains to be problematic in the CHT region. Nonetheless, it was found that the meetings mainly revolve around asset management and income generation as per the project design and no fix monthly agenda was provided by EEJMP management to CFs.

Lesson 6:

Targeting women as the main or lead beneficiary with software support is likely to increase women's empowerment and decision-making power. Economic empowerment of the household alone does not automatically translate to women's empowerment. One of the main lacking of the project is the lack of focus on women, which is shown in both the type of IGA (i.e.

[30] EEP/Shiree programme finds that health shocks is one of the major reasons one remains or falls into extreme poverty.

no flexibility to choose a female-friendly IGA, whether it is transformative or traditional) and the little number of women selected as main beneficiaries. EEP/Shiree wider programme learning shows that female headed households are one the most difficult groups to graduate out of extreme poverty and more support is required to graduate this group out of extreme poverty.

Lesson 7:

The ability of BHHs to protect their gains after the project period needs to be a core part of the design, implementation and M&E of the project. Although the main theme of Innovation Fund Round Four projects is sustainable graduation, this element is the weakest in this project. The sustainability of the market model established need to be considered earlier on from the project design; the sustainability of revolving fund model, particularly when one requires continuous funding or support (such as a business model or linkage with local government); access to good raw materials particularly when the seeds or cuttings are not widely available in the CHT region; and the sustainability of the gain for BHHs who are prone to natural disasters.

Section 5 Recommendations

This section will provide recommendations based on the findings and conclusions of this project.

5.1. Recommendations for National Government

1. Simplify process to obtain permanent registration of land tenure ownership for the extreme poor indigenous community which will lead the way to a more sustainable resource management in the CHT region.
2. Extend institutional services such as financial services, extension services and training from DAE to reach extreme poor households, particularly those living in the remote areas through collaboration with NGOs and other non-State stakeholders.
3. Increase the extent of research on scientific investigation of medicinal plants between Bangladesh Forest Research Institute (BFRI), Bangladesh Agriculture Research Institute (BARI), Bangladesh Council for Scientific and Industrial Research (BCSIR) and universities to inform the importance of medicinal plants, its benefits and conservation.
4. Include as part of extension services of DAE the creation of a longer term platform of resource centre learning in each Upazila in the CHT region to increase health benefits awareness of traditional medicinal plants, provide technical support and to increase market linkage with buyers.
5. Include medicinal plants seeds and cuttings distributions by Bangladesh Agricultural Development Corporation (BADC) to allow farmers' access to good quality medicinal plants' raw materials.

5.2. Recommendations for Non-Government Stakeholders for future replication or scale up

Recommendations for Lesson 1:

- Medicinal plants experts to be identified earlier in the project with clear Terms of Reference (TOR) and budget to ensure technical support throughout the project.
- Introduce more varieties of medicinal plants for cultivation and flexibility to adjust the project design based on the suitability of different plants in the CHT hill soils. Utilize action-based research in piloting different types of medicinal plants.

Recommendations for Lesson 2:

Revolving fund model needs to take into account: an accountable means to transfer funds, location proximity between the first and second year beneficiaries, sustainability of the model and the additional work required from the CFs.

- Factor at design and budgeting stage, an increase in the number of monitoring visits by CFs to convince and motivate BHHs to maximise their harvest so that they can have adequate input for second year BHHs.
- Ensure first year and second year BHHs are located within proximity to mitigate transfer and logistical costs.
- Take adequate care in explaining the revolving fund model to BHHs.
- Maintain good documentations and record to ensure that first year BHHs return the agreed percentage of their investment to the second year BHHs.
- Establish clear regulations on how to measure in kind (e.g. daily rate of labour for women and men, numbers of seedlings per plant, etc) and course of actions in case of natural disasters, migrations, etc.
- Sustainability strategy need to be developed well at design stage to expand the model beyond the project period, whether for the NGO itself to maintain (in which case additional overhead and management costs need to be factored in, which is beyond the present-day funding structure of donors) or to link with local government to maintain and monitor the process.

Recommendations for Lesson 3:

- Include financial literacy module, including providing information on the local savings products and loans option to encourage more savings in terms of frequency and amount, and discourage borrowing at high interest rates.

Recommendations for Lesson 4:

- Collection of evidence-based analysis on the environmental impact of medicinal plants cultivation throughout the project period is required to drive policy making towards a more environmentally sustainable livelihood alternatives in the CHT region, in line with Sustainable Development Goal (SDG) No. 15 to reverse land degradation and halt biodiversity loss. Evidence-based research of medicinal plants is currently lacking in the CHT region.

- Organize motivational and awareness raising campaigns regarding medicinal plants and their benefits at community level, and amongst the younger population with the involvement of community leaders and local community based organizations such as schools and religious organizations.
- Increase collaboration with other organizations involved in the medicinal plants cultivation and resource persons for action-based research activities to increase awareness, knowledge sharing and dissemination.
- Facilitate discussions with other stakeholders (State and non-State) to ensure intervention on health in the CHT region is not undermined and that both traditional healing and modern health facilities can work hand in hand to reach the extreme poor.
- Incorporate in the project design, capacity building of traditional healers or *baidyas* so that they are able to provide first-contact health advice utilizing relevant modernized traditional herbal medicine.

Recommendations for Lesson 5:

- Include in the project design and implementation a well structured capacity building and leadership training module for the extreme poor households and the marketing networks to increase their confidence and negotiation skills to deal with buyers. The module should also include a component on how to address language barriers. A considerable budget should be allocated for these 'indirect benefits' and away from the traditional evaluation of 'direct benefit' ratio.
- Include structured social topic such as gender, nutrition, health, hygiene and environmental issues in monthly awareness raising meeting to cultivate longer term behavioural change.

Recommendations for Lesson 6:

- Provide additional tailored support for disadvantaged groups such as female headed households and households with a disability family member to enable them to better engage in the cultivation, harvesting and selling of medicinal plants.
- As part of the project design, increase the number of women as main beneficiaries and increase inclusion of women in project activities conducive in increasing their decision-making power and confidence (for example, as members of treasury, purchasing committee or marketing network), whilst providing gender-sensitive software supports[31].
- Incorporate flexibility in the project design on the selection of IGAs through households micro-plans taking into account beneficiaries capacity and preference (for example, some female headed households may prefer more livestock than medicinal plants due to mobility issue).

Recommendations for Lesson 7:

- Incorporate at the design stage, a co-operative model where appropriate so that beneficiaries will be able to self-sustain beyond the project period in managing their businesses[32]. This needs to include a storage solution of medicinal plants particularly in the CHT region where households are scattered and remote.

[31] EEP/Shiree Gender Mainstreaming Strategy and Guidance note can be found in EEP/Shiree website here.

[32] More on how a co-operative works can be found here.

- Incorporate culturally acceptable technology to find a more sustainable solution to shifting jhum cultivation (environmentally and economically) as part of the project design, such as Sloping Land Agriculture Technology (SALT)[33] and/or Integrated Soil Fertility Management[34].
- Consider utilizing mobile-based technology to provide update on market information, or developing simple technology packages for production, collection, post-harvest handling, drying, packing and marketing to improve productivity, quality and assurance of steady supply (Maniruzzaman, Mahmud and Ahmed 2008:29).
- Include disaster risk reduction preparedness training and risk mitigation particularly in disaster-prone areas of the CHT region.
- Allocate adequate budget for capacity building to increase confidence of the extreme poor to demand their rights for GoB's support and services, including access to safety nets. Structure training to provide awareness to the extreme poor on the services and support available from different line governments.
- Facilitate dissemination of services available from the DAE (such as agriculture fair at upazila and district level, field demonstration, Krishi card facilities and resource person of DAE) to households level and encourage households interaction with Sub-Assistant Agriculture Officers (SAAOs) of DAE.
- Maintain good level of engagement with local government institutions throughout the project period, including attendance of monthly coordination meeting.
- Collaboration with State and non-State actors in the CHT region to advocate for land ownership for a more sustainable resource management.

[33] SALT technology involves growing field and permanent crops in three to five meter bands between contoured rows of nitrogen fixing trees which has been widely practices in the Philippines.

[34] Adding organic matter and applying a small amount of mineral fertilizers and planting legume crops that naturally deposit nitrogen into soil, which has been found to be successful in African soils (Montpellier Panel Report, 2014)

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Annexes

Annex 1: Exit Strategy

The exit report was prepared and submitted by ECo-Development on 3rd November 2014.

Medicinal Plant Cultivation

As per project plan, following steps were implemented to ensure sustainability of medicinal plant cultivation of beneficiaries even after the project phase out:

- Each BHH has acquired 2 acres of land to cultivate medicinal plant
- Each BHH has gained technical skills to cultivate medicinal plant
- Each BHH is now able to preserve seeds of Turmeric, Kalmegh and Ashwagandha
- Each BHH can now save their income in both individual and group bank account
- Each BHH can share information relating to market price and products' selling through established network among group members
- Agreement has been signed with private sector companies to sell medicinal products

Vegetable Gardening

- BHHs were given hands on training by horticulture experts from government line departments on how to make mixed vegetable gardening, organic manure, pest control without toxic chemical, and seed preservation
- BHHs can now directly contact various government line department for service
- BHHs have began selling vegetables and depositing remaining savings into their bank accounts

Poultry Rearing

Each BHH is now capable of:

- Diagnosing disease
- Vaccinating
- Communicating directly with various government line departments for service

Learning

- Cooperative attitude of BHHs help smooth the project implementation
- Soil in Bandarban is suitable for Basak and Kalmegh; however, Ashwagandha and Simul are better produced in low lands
- Medicinal plants can be cultivated with other crops
- Awareness and interest on medicinal plants has increased within the local community
- Bank account is important to receive government assistance or service delivery
- Avoid hilly steep land
- Plant medicinal seeds in the lower part of the hills or land area free from direct sunshine heat or at fallow plain
- Extreme care is required particularly during rainy season
- Provide proper shade on planted seeds
- Include more varieties of medicinal plants for cultivation
- Avoid chemical fertilizers and use organic manure

Annex 2: Financial Overview

Expenditure Item	Original Budget	Revised Budget	Actual Expenditure	Variance	Remarks
Human Resource Cost	4,719,000	12,625,105	13,067,008	8,348,008	BDT 4m attributed to management intern international salary as agreed with EEP/Shiree; additional staff for M&E and research officer of BDT 2.5m; Number of Community Facilitators doubled from 4 to 8 which increases the budget by BDT 1.3m
Travelling Cost	432,000	657,090	688,120	256,120	
Vehicle &Equipments	460,000	809,840	809,840	349,840	
Office Rent and Utilities	468,000	820,801	775,944	307,944	
Administrative Cost	624,000	828,178	730,921	106,921	
Operational Cost	758,500	1,083,064	838,354	79,854	
Direct Delivery to Beneficiaries	23,940,000	15,981,499	15,980,808	(7,959,192)	Significant changes to the model with beneficiaries' numbers increased from 400 to 750, however at reduced cost due to revolving fund model; reduction of nursery maintenance costs from an average of BDT 29,750 to BDT 15,000 for first year beneficiaries and BDT 2,100 for second year beneficiaries; and power pump and deep tubewell cost was replaced with additional poultry and vegetable gardening support.

Indirect Delivery to Beneficiaries	1,935,000	549,977	529,595	(1,405,405)	Yearly training cost on medicinal plants and nurseries were reduced by BDT 0.6m and training on healers and Jumiya's Cooperative Groups (JCN) members were taken off the budget of BDT 0.8m
Management Cost	666,730	1,320,245	1,324,656	657,926	Management cost increased from 2% to 4%
Contingency	666,730	538,192	-	(666,730)	
TOTAL	34,669,960 *	35,213,990	34,745,246	75,286	

Note: Amount in BDT

*The total initial contracted budget was BDT 35,971,936

Annex 3: Progress against LogFrame

	Indicator	Target (Year 3)	Progress report	Means of Verification
Impact Government of Bangladesh MDG targets 1 and 2 on income poverty reduction and hunger achieved by 2015.	Reduction in the proportion of people living in extreme poverty in line with MDG targets.	A reduction of between 1 to 2 million extreme poor.	-	
Outcome 750 indigenous households in Bandarban Hill district lifted themselves out of extreme poverty by 2014.	Level of income.	80% of BHH have annual income over BDT 65,000	BHHs have average monthly income of BDT 12,135 or yearly of BDT 145,620	Endline
	Nutritional status.	In 80% of BHH: • 60% of women have achieved an increase in BMI by 1 kg/m2 • 60% of women showing reduced levels of anaemia >10g/l • 60% under 5s with improved Zscore by 0.25SD.	Unknown	This is not measured
	Household assets and expenditure	In 80% of BHH: • Expenditure has improved by at least 60% • Assets have improved by at least 40%. • Savings has improved at least 30%	• Expenditure has improved from BDT 2,240/phh/month to BDT 10,119 • Total assets have improved from BDT 2,971 to BDT 188,002 • Savings have improved from 0% to 91% with an average of BDT 13,783	Endline

	Levels of empowerment (Social Empowerment).	80% of BHH organized, formed own cooperatives, determined of their livelihood	45% of BHH organized, formed own cooperatives, determined of their livelihood; 41% answered positively for women's empowerment	Annual progress reports, direct observation, endline
Output 1 Commercial cultivation of medicinal plants has been introduced among the jumiyas as alternative profitable means of their livelihood	Households involved in commercial plant cultivation	All BHHs (750)	All 718 (32 died or migrated)	Monthly progress report
	Level of confidence	90% of BHHs are determined of their livelihood	Medium level of confidence – some requiring more support still while others said they can now manage from savings if they had no work for a month or subjected to health shocks	Observation, Interviews
Output 2 Sustainable local and national market of medicinal plants established.	BHHs getting income over BDT 129,096 per year	All BHHs (750)	BHH have average monthly income of BDT 12,135 or yearly of BDT 145,620	Endline
	No. of HH liaised with local buyers	All BHHs (750)	Unknown	
	No. of network members trained on market analysis and promotion.	5	1 network of 20 members who meets bi-monthly in Bandarban office	Monthly report
	No. of agreement between the network and pharmaceuticals/ manufacturers	.20	Agreement with 7 local and national buyers	Final report
	Ratio of production and selling	100%	Unknown – cost benefit	

Annex 4: Medicinal Plants suitability in the CHT region

Medicinal Plants Types and Benefits

The medicinal plants introduced in this project are as follows:

1. **Basak** or locally known as Basok (scientific name: *Justicia adhatoda or Adhotoda vasica)*or english name: vasaka) – leaf used for asthma, cough, fever, cold, sneezing, tuberculosis – dried and grinded leaf is taken with salt and water daily for 7 days or juice of leaf and turmeric is taken once daily for 3 days

2. **Kalmegh** or locally known as Kalomegh (scientific name: *Andrographis paniculata* or english name: king of bitters) used to treat infection, or for fever, cough, dysentery, hepatitis

3. **Ashwagandha** or locally known as Ashwagondha (scientific name: *Withania somnifera* or english name: winter cherry) is used as a herb in Ayurveda and can be applied externally for tumors, tubercular glands, carbuncles, and ulcers or for breast milk, energizer and various other symptoms

4. **Simul** (scientific name: *Bombax* or english name: silk cotton) can be used for rheumatism, dysentery

5. **Halud** (scientific name: *Curcuma longa* or english name: turmeric) – Rhizome used for skin dullness, wounds in livestock, blood purifier

The Ministry of Health and Family Welfare (MOHFW) have recommended twelve species (Table 1) to be promoted in the CHT. Of the twelve species, three has very minimal demand and therefore have not been recommended by ICIMOD (2008:27).

Bangla Name	Scientific Name	Other recommendations*	Estimated Market Size (million Taka)
Basak	*Adhatoda vasica*	BFRI, WHO, MOEF	13.00
Ghritakumari	*Aloe barbadensis*	WHO, MOE, IC	10.00
Kalomegh	*Andrographis paniculata*	BFRI, WHO, MOEF, IC	7.08
Neem	*Azadirsehta indica*	WHO, MOEF, IC	4.80
Amlaki	*Phyllanthus emblica*	WHO, MOEF, IC	12.95
Sharpagondha	*Rauvolfia serpentina*	BFRI, WHO, MOEF	6.00
Bohera	*Terminalia bellirica*	BFRI, WHO, MOEF, IC	16.28
Haritaki	*Terminalia chebula*	BFRI, WHO, MOEF, IC	23.38
Ashwagondha	*Withania somnifera*	WHO, IC	30.0

**Bangladesh Fisheries Research Institute (BFRI); World Health Organization (WHO); Ministry of Environment and Forest (MOEF); Inter Corporation (IC)*

Suitability of medicinal plants in the CHT region

1. **Kalmegh**

Overall: suitable to be cultivated in the CHT region both in monsoon and drought season.

Pros:

- Easy to cultivate (high rate of seeds germination) with good harvest/production and require little maintenance (2-3 times in 6 months required to clear at 15 days each)
- Minimal water required (7-10 days once a season) and none required during monsoon season
- It does not attract pest and is resilient to disease
- Suitable to be cultivated with other vegetable and/or fruit cultivation in plain land
- High market demand
- Good quality from the region despite a smaller size by comparison to products from India

Cons:

- Heavy rain will reduce harvest rate significantly
- More effort than Basak as soil digging and bed preparation for seeds dispersal is required
- High price fluctuation and mostly controlled by syndicate at national level

2. **Basak**

Overall: suitable to be cultivated in the CHT region in any season**.**

Pros:

- Easy to cultivate with good harvest/production and quality
- Minimal water required
- Suitable to be cultivated other vegetable and/or fruit cultivation in the plain land and jhum hill
- Does not require any use of pesticides
- High national market demand (although less in the local market); often purchased by pharmaceutical companies
- Minimal fluctuation in price

Cons:

- Heavy rain will reduce harvest rate
- Need the most space (3 feet by 3 feet for one plant cutting)
- During planting it needs more frequent maintenance after it is grown (twice a year)

Beneficiaries in Naikhangchari and Ali Kadam FGDs prefer this cultivation compared to other types and some use the plants for own consumption.

3. **Ashwagandha**

Overall: not suitable to be cultivated in the CHT region particularly in the hill

Pros:

- High demand from plain land or at national level (but not as big as Kalmegh)
- Grows well in the plain land
- High price

Cons:

- Heavily affected in heavy rainfall (during monsoon)
- Water dependent and subjected to water irrigation shortage in the hill
- Requires good space for cultivation
- Cannot be cultivated with other crops
- Local people are not aware of the importance or medicinal values of the plantation and therefore little demand

None of the beneficiaries in Rowangchhari, Ali Kadam and Naikhangchari interviewed in the FGD had success in cultivating Ashwagandha. The later is due to land slide and heavy rain.

4. **Simul**

Overall: not suitable to be cultivated in the CHT region

Pros:

- Minimum water required
- Minimal maintenance require (clearing of wheat and grass and preparing beds)
- High demand particularly in the plain land or at national level

Cons:

- Although it can be cultivated with other crops, if cultivated together, the other crops will have low yield harvest
- Best to be cultivated before the monsoon season only
- High price fluctuation
- Low usage within the local context
- Seeds are not available in the CHT region
- Heavily affected in heavy rainfall (during monsoon)

In all the three Upazila where FGDs were conducted, there was minimal seeds germination rate among the beneficiaries.

Annex 5: EEP/Shiree Innovation Fund Round Four Sustainable Graduation

The key overarching concept of resilience includes efforts aimed at:

- improving people's capacity to cope with hazards and shocks;
- spreading people's risk over wider number of options and choices to substitute and diversify income sources;
- encouraging more forward-planning, investment and savings from beneficiaries;
- improving their ability to manage uneven income flows (for example from seasonal labour peaks and troughs) and expenditure requirements through methods of balancing out spending and saving, reducing their short term dependency upon exploitative relations;
- having access to collective institutions rather than being exposed to crisis individually or in households;
- improving the security of their productive assets through progressive asset substitution and raising productivity levels over time as well as through forms of insurance;
- reducing morbidity and vulnerability to health crises;
- enabling beneficiaries to transfer a stronger socio-economic position to one's offspring;
- preparing youth to maintain the improved platform, and themselves to improve beyond it rather than slip back;
- in the absence of other well-functioning institutions, to have the support and care of one's empowered offspring in old age.

Annex 6: Shiree Multidimensional Graduation Index for Innovation Fund Round Four

Essential Criterion	Rural	Urban
Food coping strategies of household – including but not limited to: eating smaller portion of food, eating less than three times a day, eating food of lower than normal quality, giving more food to an earning household member, etc	≥2 strategies = 0 <2 strategies = 1	≥2 strategies = 0 <2 strategies = 1
Supplementary Criteria		
Poverty line - using the mean income and standard deviation in the HIES 2010. Income included both cash and in-kind sources	2010<25.5 =0, ≥25.5 = 1 2014<35.5 = 0, ≥35.5 = 1	2010 <41 =0, ≥41 = 1 2014 < 57 = 0, ≥57 = 1
Number of sources of income – number of jobs of all household members	<2 jobs in household = 0 ≥ 2 jobs in household = 1	<2 jobs in household = 0 ≥ 2 jobs in household = 1
Cash savings – amount of reported cash savings in Taka/household	<1000 Taka/household = 0 ≥ 1000Taka/household = 1	<1000 Taka/household = 0 ≥ 1000Taka/household = 1
Value of productive assets	<10,000 Taka/household = 0 ≥10,000 Taka/household = 1	<7000 Taka/household = 0 ≥7000 Taka/household = 1
Number of non-productive assets of household	<4 assets = 0, ≥ 4 assets = 1	<4 assets = 0, ≥ 4 assets = 1
Food diversity of household - pulse, green leafy and other vegetables, fruit, milk, eggs, fresh/dried fish, poultry and meat	<5 foods = 0, ≥5 foods = 1	<5 foods = 0, ≥5 foods = 1
Women Empowerment - of female adult member of household based on decision making and views	<75% answering positively = 0 ≥75% answering positively = 1	<75% answering positively= 0 ≥75% answering positively= 1
Access to safe drinking water of household - defined as meeting the MDG guidelines	No = 0 , Yes = 1	Not Applicable
Access to hygienic sanitation of household - defined as meeting the MDG guidelines	No = 0, Yes = 1	Not Applicable
Access to land of household - all land comprising homestead, cultivable, temporary lease, sharecrop and use free of charge	No = 0, Yes = 1	Not Applicable
Maximum score	**11**	**8**
Graduation threshold	**Essential 1 + 6 Supplementary**	**Essential 1+ 4 Supplementary**