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## **Final Report**

## Socio-Economic and Ecological Impact Study of GEF-UNDP-Government of Nagaland Project

## 'Sustainable Land and Ecosystem Management in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security'

Prepared by





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'Sustainable Land and Ecosystem Management in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security'

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#### CAUTION STATEMENT:

The data has been collected from the field by the project team using methodologies like Focus Group Discussion and other PRA tools. The UNDP team has conducted one more round of field data collection after the preparation of this report, in which a negative deviation of around 40% (average) in overall increase in productivity has been recorded. Thus the quantitative improvements demonstrated in the study may have a negative deviation (upto 40%) in Mokokchung district.

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#### **EXECUTIVE SUMMARY**

Shifting cultivation is believed to have originated during 7000 BC. In India, prevalence of shifting cultivation is more in the North Eastern states than in any other region - which is locally called Jhum. A considerable portion of the landmass of the state of Nagaland is under shifting cultivation. There are different arguments with regard to the impacts of shifting cultivation on forest cover and environment; however the practice in present form with very short cycles is shown to be affecting the forest cover and soil fertility in the North Eastern states. On the other end, this form of cultivation is the significant source of the staple food - rice for the local communities living in the villages of the states of North Eastern India, especially Nagaland. In order to address issue in the state the GEF-UNDP-Government of Nagaland Project "Sustainable Land and Ecosystem Management in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security" was initiated in the year 2009. The project focusses on the three districts of Mon, Mokokchung and Wokha in the state. The project aims to address the issue of shifting cultivation by developing and demonstrating sustainable land management practices with an ecosystem approach. After five years of the project implementation UNDP commissioned the InsPIRE Network for Environment to carry out a socio-economic and ecological impact study of the project. The report is an outcome of the impact assessment carried out between September 2014 and January 2015.

The project activities can be broadly classified as a) measures to improve the economic benefit from *Jhum* cultivation by increasing productivity as well as improving market linkages, b) improve *Jhum* productivity through soil and water conservation measures, c) improve soil fertility during the fallow period so that the land will be more fertile during the next cultivation season and d) provide the community alternate livelihood through Integrated Farm Development and Self Help Group based activities.

Fallow management activities of the program are of too short a duration as of now to demonstrate measurable impacts, (maximum duration of two years) and to understand the impact of the activities on regaining the soil fertility during the fallow period through better fallow management practices by measuring different soil fertility and guality parameters. The improvement of soil fertility in managed Jhum cultivation areas is evident from the high productivity which resulted from soil conservation activities. In case of Biodiversity analysis, it was found that the managed fallow areas have better diversity than the unmanaged fallow areas. The plant species composition in the managed and unmanaged fallow areas were found to be completely different from the pristine forest area, which was as expected due to the changes in the species composition during different stages of succession. The project has precisely marked a positive impact on the biodiversity and fertility of both the fallow areas and also the Jhum cultivation areas. The number of trees planted in the Jhum cultivation areas, before leaving them fallow has tremendously increased in all the targeted villages through awareness creation and sensitizing the community institutions.

The project also resulted in converting more than 2100 ha of Jhum cultivation areas permanently to forest areas, to be conserved by the community. Altogether 19 crops have been observed as predominantly cultivated in the sampled villages in three districts of Nagaland. The pattern of production of different crops from Jhum cultivation was more or less similar in districts of Mokokchung and Wokha where rice was the prime crop cultivated in the Jhum fields, whereas in Mon rice production was comparatively low. The project has demonstrated tremendous increase in the production of most crops cultivated in the Jhum fields. Mostly Jhum cultivation in the state was a practice for subsistence rather than a livelihood activity. Cost-benefit analysis has demonstrated that Jhum is not a financially viable practice, however, local communities are largely dependent

on *Jhum* for their staple food requirements such as rice and are forced to continue practicing *Jhum* cultivation. The project also demonstrated an average increase of over all benefit from *Jhum* production - 2%, 112% and 58% in the districts of Mon, Mokokchung and Wokha respectively and an increase in the net cash benefits in these districts respectively as 8%, 206% and 59%. The project measures have not shown a very high level of selfreplication by the community since the labor and working capital investments are unaffordable for them.

Presently, Jhum has a two year cropping phase in all the sampled villages and they slash new Jhum plots every year. The project demonstrated an increase in cropping period from 1 - 4 years. Even though it is too early to assess the impact of the project on Jhum cycle, some villages have expressed their willingness to increase the Jhum cycle. Even though the project has demonstrated tremendous increase in the production, none of the villages cultivate rice in a plot for more than two years. There are cultural and traditional reasons for this practice. As far as providing guidance and training to the communities in better agriculture practices is concerned, Longsa village in Wokha district has demonstrated the success of these measures with an increase in average household income from Rs. 13,000 to Rs 44,000 in a period of four years.

The project has also demonstrated a positive change in the quality, quantity and variety of the agri-horticultural produce in the three project districts due to the project interventions. The increase in size of Maize, Colocassia, Cucumber and Pumpkin due to the project interventions has enabled farmers to reduce wastage in marketing. The project attempted to introduce high yielding varieties of Banana, Maize, Ginger and Turmeric. However, all of these failed in gaining popularity due to different reasons. Banana production has decreased to one third over a period of four years and the taste of the introduced variety of Maize was not preferred by the community.

The survey shows that altogether 11 varieties of Rice from the surveyed villages along with 9 varieties of Maize, 3 varieties of Cotton, 2 varieties of Chilly and 1 variety of Bamboo, Soyabean and Yam each, have either been lost or are on the verge of being lost in recent years. The project has also initiated seed banks in most of the sampled villages in Mokokchung district. In all the villages where Land Use Committees are formed, they ensure the cultivation of all existing varieties every year to maintain agricultural biodiversity in *Jhum* fields. Different livelihood options like tea, pineapple, and other cash crops and horticulture cultivated as part of the project have also demonstrated significant livelihood generation with more viabilities than *Jhum* cultivation.

In the state of Nagaland, women are more involved in agriculture and marketing of the produce than men even though men voluntarily take up the responsibilities and work which require more physical strength. Marketing sheds in Mon District were found to increase the income of women from an average of Rs. 1,000 to Rs. 2,000 per month. This also increases the sales volume and indirectly increases the income of the community in the nearby villages. Marketing sheds developed under various schemes, including the present project provide a common sales platform to the village and thus save the time of the women as they do not have to travel to the nearby town to sell their produce. This extra time enables them to generate additional income of at least Rs. 200 per month from weaving and basket making.

Women SHG activities promoted through the project have also shown tremendous livelihood improvements. Piggery has enabled the women SHGs to generate revenue ranging from Rs. 15,000 to Rs. 80,000 over a period of two years. Annual Revolving Fund (ARF) support to SHGs in Mokokchung district (Mongsenyimti Village) improved the annual income of the members from Rs.7,000 to Rs.40,000. In Mongsenvimti Village using the ARF, the women's SHG has procured land in their names – which is a classic example of women empowerment. Micro credit facilities are also being utilized by the members using the ARF. Rice mills are also enabling the SHGs to generate revenue ranging from Rs. 200,000 to Rs. 240,000 per annum in Mon.

Land Use Committees (LUCs) are pivotal institutions developed as part of SLEM project for participatory planning to ensure sustainable landuse. SWOT Analysis has been carried out for all of the LUCs in sampled villages. A conflict of interest between other village institutions, especially VDBs have been identified as a major threat. Strong leadership and a more democratic mode of formation were identified as major strengths. Awareness among the communities about the necessity of sustainable planning for land use was observed as the major opportunity. Lack of legal ••• Final Report

status was found as the significant weakness of the LUCs as institutions. In order to achieve the objectives behind the formation of the LUCs the project needs to complete three more steps: a) Institutionalizing the LUCs to empower them to function as institutions with legal or statutory validity, b) Capacity Building of the LUCs for carrying out sustainable and participatory land use planning in a scientific manner and c) Monitoring the functioning of these committees for a year to take additional corrective measures to fine tune their functioning.

## CHAPTER 1 Introduction

Livelihood dependency of the communities on forest is very high in North Eastern India thereby imparting livelihood pressure on the forest ecosystems, ultimately leading to their degradation. The North Eastern hill state of Nagaland harbors a unique mosaic of discrete types of pre-industrial political economies belonging to different clans and tribes, practicing semi-nomadic swidden agriculture, terraced wet agriculture, high montane pastoralism and traditional trade and barter<sup>1</sup>. Swidden agriculture or shifting cultivation which is locally called Jhum cultivation (here after referred as Jhum) is one of the main means of staple food production by the communities living there. Jhum is generally believed to have an adverse effect on the environment since fresh forests are cleared after every Jhum cycle, even though scientific studies have proven that the actual fault lies in the shortening of Jhum cycle from an earlier longer period of around a 40 years cycle to a 5 -10 years cycle, which is causing ecosystem damages like deforestation and soil erosion<sup>2,3</sup>. Presently, the cycle has narrowed down to even two years.

Originating during 7000 BC and surviving for more than 9000 years, shifting cultivation has blended with the tradition and culture of the people traditionally practicing it<sup>4</sup>. An enormous amount of work has been carried out by national and regional governments and other conservation agencies for halting conventional shifting cultivation across the world but the efforts have instead contributed to deforestation and decrease in carbon storage<sup>5, 6</sup>. Most of these policies were counterproductive and therefore new, more effective and socially acceptable policy options that help to improve shifting cultivation are needed, instead of replacing the practice of shifting cultivation<sup>7</sup>. The Shillong Declaration<sup>8</sup> recommends that policy makers should re-examine the policies in place, remove explicit policies and policy instruments that discourage shifting cultivation, and strengthen the implementation of existing beneficial policies.

Nagaland is also facing major ecological challenges due to the large extent of shifting cultivation prevailing in the state. In order to address the issue in the state, the GEF-UNDP-Government of Nagaland Project "Sustainable Land and Ecosystem Management in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security" was initiated in the year 2009. The project focusses on three districts - Mon, Mokokchung and Wokha in the state and aims to address the issue of shifting cultivation by developing and demonstrating sustainable land management practices with an ecosystem approach. After 5 years of project implementation, UNDP has commissioned InsPIRE Network for Environment to carry out a socio-economic and ecological impact study of the project.

<sup>7.</sup> Kerkhoff, E., and Sharma, E., 2006. Debating Shifting Cultivation in the Eastern Himalayas. Farmers' Innovations as Lessons for Policy. International Centre for Integrated Mountain Development (ICIMOD), Kathmandu.

<sup>&</sup>lt;sup>1.</sup> Nagaland Human Development Report 2005.

<sup>&</sup>lt;sup>2</sup> Ranjan, R., and Upadhyay, V.P. 1999. Ecological problems due to shifting cultivation. Current Science 77:1246–50

<sup>&</sup>lt;sup>3.</sup> Ramakrishanan, P.S., Saxena, K.G., Rao, K.S. 2006. Shifting agriculture and sustainable development of North-East India: Tradition in Transition, UNESCO and Oxford& IBH, New Delhi; p 495

<sup>&</sup>lt;sup>4</sup> Maithani B. P. (2005) Shifting cultivation in North East India, Policy issues and interventions, Mittal Publications, P 165.

<sup>&</sup>lt;sup>5</sup> Geertz, C., 1963. Agricultural involution: the processes of ecological change in Indonesia. University of California Press, Berkeley (CA).

<sup>&</sup>lt;sup>6</sup> Fox, J., 2000. How Blaming 'slash and burn' Farmers is Deforesting Mainland Southeast Asia. Asia-Pacific Issues, East-West Center, Honolulu, Hawaii.

<sup>&</sup>lt;sup>8</sup> Shillong Declaration was prepared by participants of the Regional Shifting Cultivation Policy Dialogue Workshop for the Eastern Himalayas held in Shillong, India, from 6-8th October, 2004.

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#### 1.1 Objectives

- To assess the impact of GEF-UNDP-Government of Nagaland project "Sustainable Land and Ecosystem Management in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security" on fallow management, soil productivity, soil erosion, agriculture pattern and productivity and the livelihood scenarios of the communities in the project area.
- To assess the sociological impact of the project especially on the marginalized sections of the community, gender and traditional institutions.
- To document the best practices evolved through the project and also the perceptions of the target community towards the project impact
- To identify the policy and legal bottlenecks for upscaling and replicating the lessons learnt from the project

#### 1.2 Geography, environment and contemporary development of Nagaland - In brief<sup>9</sup>

The 8 North Eastern states of India constitute a meagre 8 per cent of the entire geographical area of the country. Nagaland is the 16<sup>th</sup> state of the Union of India. According to the 2011 census Nagaland has a population of 19.79 lakhs, with a male to female ratio of 1:0.9. The state has a literacy rate of 79.55 percent.

The total geographical area of the state (16579 sq.km) is divided into 11 administrative districts which are further divided into Blocks and Circles for administrative convenience. About 98 percent of its total area is mountainous and the altitude varies between 194 m to 3048 m above msl. Physiographically, Nagaland can be divided into three NE-SW trending segments. 1. High hill ranges in the east; 2. Medium high hill ranges in and 3. Western low ranges. The high ranges consist of highest mountain range in the state, attaining a height of 3840 m at Saramati

which traverses the extreme eastern high hill ranges, it takes a north south course separating Nagaland from Myanmar. The Barail range is another mountain range in the south western part of the state. Japfu is the highest peak (3014 m). These two ranges spread out over many ridges, spurs and small branches which are the spiral backbones of the physiography dissected by a number of seasonal and perennial rivers and rivulets with 'V' shaped valleys with sloppy spurs. The medium high hill ranges in the intermediate zone are characterized by a continuous hilly range with between 600 m and 1200 m. These ranges run through the middle of the state-from northeast to southwest like a spiral column. The Western low ranges have an altitude ranging between 110m and 160m above msl. The most important plain is Dimapur. The hilly nature, rugged terrain and lofty ranges have a great bearing on the environment and development including the human landscape of Nagaland.

Nagaland enjoys diverse climates ranging from sub-tropical to sub-montane temperate and the state's geography creates many microclimatic zones also. The summer and winter temperatures over the hills vary from 4° C to 28° C and those over the foothills have range between 12° C to 34° C. Monsoon season is in peak between May and October which makes an average annual rainfall between 1200mm to 2500mm. The forested land occupies 13,044 sq km of land that constitutes about 78.62 percent of geographical area of the state (FSI Report, 2013). More than 80 percent of the rural population of Nagaland directly depends on forest resources for their survival. The forest types found in the state are Tropical Wet Evergreen, Tropical Moist Deciduous Montane, Wet Temperate and Sub-Tropical Pine forest. There are three Wildlife Sanctuaries and one National Park in the state. Bamboo, often known as "Green Gold" is a plant that yields renewable natural resource and is found extensively in Nagaland. The soils of Nagaland are generally acidic, very rich in organic carbon but poor in phosphate and potash content. Except in the gradient, the soil layer is thin because of torrential rain, leading to rapid erosion of top soil layers from the hillslopes.

 $<sup>^{</sup>g.}$  This section of the report has been extracted from Rawat, M.S. (2014) Integrated Watershed Management: An Alternative Approach for Sustainable Development in Nagaland, Journal of Agriculture and Life Sciences 1(1), 1-14)

The most important occupation is agriculture which occupies 68.03 per cent of working force. Agriculture although dominates the primary sector, it has still not developed to a desired level, where more than 76 per cent of the total cropped area is under shifting cultivation, using mostly traditional technology, slow adoption of modern technology associated with low productivity and environmental degradation. The annual cultivated area under Jhum is 131.349 ha and this alone accounts for 58.95 percent of the total net cultivated area. This extent of area under shifting cultivation is also maximum in Nagaland (0.39 million ha), compared to other states of North Eastern hills. Due to time factors of time and the systemic to changing requirements of high population pressure, Jhum cultivation has caused drastic decline in crop yield, loss of forest wealth, soil fertility, biodiversity and environmental degradation.

According to the findings of a socio-economic study, the GDP of the state as estimated during 2002-03 is Rs. 2,64,148 with an average annual growth rate of 8.18% (10yrs) and 14.88% (5yrs) giving a per capita income of Rs. 12,292 with average annual growth rate of 2.8% (10yrs) and 9.29% (5yrs). At present the primary sector contributes 37.39% and average annual growth rate of 13.82% (10yrs) and 22.19% (5yrs), secondary sector contributes 10.74% and average annual growth rate of 4.4% (10yrs) and 7.23% (5yrs) and the tertiary sector occupies the major chunk of 51.86% with average annual growth rate of 6.16% (10yrs) and 12.35% (5yrs).

Looking at the sector-wise development, agriculture with an average share of 91.79% contributes 34.33% to NSDP under primary sector followed by forestry and logging fishing, mining and quarrying. Under secondary sector, construction has been the major contributor with more than 90% share and contributing 10.10% to NSDP followed by manufacturing sector with 0.65%. Under tertiary sector transport and communication contributes the maximum share of 34.41%<sup>10</sup>. After 4-5 decades of economic development, primary sector (agriculture) still continues to dominate the economy with low productivity, environmental degradation and population explosion. During the same period, indiscriminate and reckless exploitation of forest cover, rapid expansion of *Jhum* activities have caused irreparable damage to the natural environment and ecology of this geodynamically sensitive and vulnerable mountain ecosystem.

#### 1.3 An overview of the GEF-UNDP-Government of Nagaland project "Sustainable land and ecosystem management in shifting cultivation areas of Nagaland for ecological and livelihood security"

Shifting cultivation (Jhum Cultivation, here after referred to as Jhum) is the main means of cultivation for subsistence and also livelihood of the agrarian communities in Nagaland. An increased area of land is now being brought under Jhum and a shortened Jhum cycle is being observed. Reducing the Jhum cycle during recent years has put pressure on resources and thus the productivity of land through land degradation, increased levels of soil erosion, hydrological imbalance, and forest degradation, all of which have caused reduction in yields, insecurity of food sources<sup>11</sup>, biodiversity loss and deforestation<sup>12</sup>. The cycle that was once 14 years or more has been reduced to 6 years or less in many places. It is estimated that 70% of the top soil loss, land degradation and water source deterioration is attributed to the practice of shifting cultivation. The system of cultivation coupled with high rainfall causes heavy erosion to the extent of removing up to 40 tonnes of top soil per hectare in a year. Land slip occurrences are common in many areas in the monsoon season. A lot of central and state government sponsored schemes have been launched in the state, which are slowly replacing Jhum with settled agriculture. Some of the institutions within and outside the state have also attempted to demonstrate sustainable models of Jhum cultivation, with different measures.

<sup>&</sup>lt;sup>10</sup>. Sema, A., 2005. Economic development in Nagaland: Prospect and constraints. Paper present as a keynote address in a seminar organized by NUTA, Nagaland University, Lumami, pp.1-16

<sup>11.</sup> Choudhuri, D and Sundriyal, R.C (2003) Factors contributing to the marginalization of shifting cultivation in north-east India: micro-scale issues, Outlook on Agriculture 32(1), 17 -28

<sup>12.</sup> Gafur A, Borggaard OK, Jensen JR, Peterson L. 2000. Changes in soil nutrient content under shifting cultivation in the Chittagong Hill Tracts of Bangladesh. Danish Journal of Geography 100: 37–46

Understanding the criticality of designing a long term solution to combat the adverse environmental impact of *Jhum* cultivation and to ascertain improvement of livelihood from *Jhum* cultivation, the GEF-UNDP-Government of Nagaland project "Sustainable Land and Ecosystem Management in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security" was initiated in three districts of Nagaland – Wokha, Mokokchung and Mon.

The project had the following expected outcomes:

Outcome 1: The policy, regulatory and institutional environment support the integration of sustainable land management practices on *Jhum* lands.

Outcome 2: Options for improving the sustainability of *Jhum* agroforestry systems are developed and demonstrated in selected project sites (70 villages spread over the 3 districts of Mon, Mokokchung and Wokha in Nagaland).

Outcome 3: Enhanced capacity to replicate the project's policy reform and field-level experiences in other parts of Nagaland, as well.

The project was initiated in the year 2009 and after five years of implementation UNDP India has commissioned InsPIRE Network for Environment (INE) to carry out a socio-economic and ecological impact assessment of the activities. The expected deliverables of the study were:

- Assess and quantify any measurable improvement in fallow management and *Jhum* practices in the project area.
- Assess any change in land productivity and soil erosion rates in the three project districts before and after the project interventions.
- Determine any change in the quality, quantity and variety of the agri-horticultural produce in the three project districts due to the project interventions.
- Understand and identify the progress made against all the project interventions such as participatory land use planning, integrated farm development etc.
- Assess any improvement in the livelihoods of local populations, with particular emphasis on women (as a result of SHG formation,

introduction of credit facilities, construction of marketing sheds etc.) as a direct or indirect result of the project intervention.

- Determine the impact of the project on vulnerable and marginalised sections of the community, on gender and on traditional institutional structure, if any.
- Document best practices from the project area in the socio, economic and ecological fields, including gender, or any other areas, if any.
- Interview different stakeholder groups such as older farmers, women, village council members etc to understand and document their perceptions about change in land productivity, quality of agriculture produce, income and livelihood related topics etc.
- Prepare a strategy for the learnings of the project to be mainstreamed and included into existing relevant legal and policy documents.

#### **1.4 Approach and Methodology**

InsPIRE had carried out the impact study between September 2014 and January 2015. An inception visit has been carried out to fine tune the methodologies in the target districts of Mon, Mokokchung and Wokha. Interactions were carried out with the state and district officials and the local communities. On the basis of the inception visits the methodologies were fine tuned for data collection and processing. The villages which were studied in detail are documented in Table 1.1.

#### **Districts** SN Mokokchung Mon Wokha Akhoya Leangnyu 1 Longsa 2 Longjang Jakphang Pongidong 3 Kupza Lapa Koio 4 Mongsenyimti Yuching Tsungiki 5 Lakhuni Lampongsheanghah Elumyo Hongpoi 6 Mongchen 7 Khar Sheanghahmokok 8 Longmisa Tuimei

#### Table 1.1: Sampled villages

## Quantitative & Measurable Improvement through Fallow Management & Jhum Practices

This chapter provides an understanding of the ecological and livelihood improvements which have occurred due to project interventions related to fallow and Jhum cultivation management.

#### 2.1 Impact on Floral Diversity

Many scientific publications state that North-East India is becoming increasingly deforested and its crop productivity is declining primarily due to shortening of Jhum cycle<sup>13</sup>. Along with the impact on the forest cover the floral diversity in the fallow area plays a crucial role in regaining the fertility of the land during the fallow period which is critical for good crop yield during the cultivation period. A comparative floral study of the forest managed through project interventions and unmanaged fallow areas were carried out to find out to estimate the impact of the project interventions on floral diversity in fallow areas. Significant differences have been observed in the population parameters like species composition, dominance and abundance etc. Since project implementation has taken place only during the last three years, the study could only highlight the initial trends in the changes in floral dynamics.

Over all it shows that floral species composition are unique in these three sampled habitats. As far as the total number of species and families are concerned, high number of species were observed in the unmanaged fallow areas and lowest were observed in the forest areas (Figure 2.1 and 2.2).

Rubiacea shows dominance in the forest areas



Figure 2.1: *Number of species recorded in the three habitats* 



**CHAPTER 2** 

Figure 2.2: *Number of families recorded in the three habitats* 

followed by Fabacea, and the all other families are represented in a more or less equal manner (Figure 2.3). 57 percent of the species recorded in this habitat are trees (Figure 2.4).



Figure 2.3: Families recorded from forest areas





<sup>13</sup> Rathore, S.S., Karunakuran, A., and Prakash, B., 2010, Alder Based Farming System a Traditional Farming Practices in Nagaland for Amelioration of Jhum Land, Indian Journal of Traditional Knowledge, 9(4), 677-680

In the unmanaged fallow areas Poaceae is the dominant family and tree species dominate here as well (Figure 2.5 and 2.6).



Figure 2.5: *Families recorded from unmanaged fallow areas* 



Figure 2.6: *Habit of species recorded from unmanaged fallow areas* 

In the managed fallow areas Fabaceae shows dominance followed by Euphorbiaceae, Asteraceae and Poaceae (Figure 2.7). Tree species dominate in this habitat as well (Figure 2.8).



Figure 2.7: *Families recorded from managed fallow areas* 



## Figure 2.8: *Habit of species recorded from managed fallow areas*

Even though the species composition is different the abundance curve shows more or less similar pattern in case of managed and unmanaged fallow areas (Figure 2.9).



Figure 2.9: *Comparative species abundance curves of the three habitats* 



Figure 2.10: *Bray Curtis cluster analysis of the three habitats* 

Shannon index values for the forest area, managed and unmanaged fallow areas are respectively 0.951, 0.977 and 0.965; which means, out of the three habitats, managed fallow areas has the highest species diversity (Figure 2.11).



Figure 2.11: Comparative Shannon Index curves of the three habitats

Comparatively lower number of species and families in the managed fallow areas was as expected since more plantations have been carried out in the managed fallow areas and as a result many naturally occupying primary species are absent. The significant output of the floral analysis is that the project interventions have increased the biodiversity of the fallow areas as reflected by the higher Shannon index value for this habitat. It should also be noted that species composition of the managed and unmanaged fallow areas are completely unique, which means the interventions are also changing the floral composition of the growing forest in the area (Figure 2.10). Since the interventions are less than three years old comparison of present diversity with that of the climax vegetation (forest area) is not possible at the moment. However the higher diversity of the managed fallow areas along with the presence of more nitrogen fixing plants will improve the fertility of the fallow areas.

#### Increased tree cover in Jhum areas

In seventy percent of the surveyed villages in Mokokchung district, villagers are mandatorily maintaining more or less 300 trees per hectare in the *Jhum* plots at the time of leaving the plot fallow. This practice has been made mandatory through an understanding among the Land Use Committees (LUCs) and the farmers. Even in those villages where the LUCs have not yet been formed also, the community has (without any documentation) made it mandatory to plant trees during the second year. In thirty percent of the villages in the district, people are voluntarily maintaining and planting trees during the second year of *Jhum* cultivation. In Mon district, more than

90 percent of the villages sampled have initiated the practice of planting trees in the Jhum plots during the second year of cultivation. 70 percent of the villages which initiated plantation of trees in the *Jhum* plots are doing it as a voluntary activity by the farmers rather than mandatory, based on a collective decision by the farmers rather than being based on any order. The number of trees maintained per hectare is also highly varying in the district of Mon. 50 percent of the villages are planting 250 – 300 trees per hectare whereas the rest are planting only less than 50 trees. In Wokha district (refer Photograph 2.1), 50 percent of the sampled villages are found to be planting less than 50 trees per hectare in the Jhum plots before they leave it fallow, which is a voluntary action.



Photograph 2.1: A Jhum plot in Wokha

#### The total area of reserve forest set aside by different villages

Jhum as an agricultural practice is diminishing over time (Figure 2.12). Results from all the villages surveyed show that all the households in the village have carried out Jhum cultivation during the 1980's only, from where the number has started declining. The lowest percentage of households doing Jhum cultivation has been observed in Khar village in Mokokchung district (13%) and highest in Pongidong village in Wokha district (97%). In most of the cases, less than 60% of the households are involved in Jhuming presently. In Mon and Mokokchung, Jhum plots are collectively decided every year and the households that are interested in cultivating in those plots initiate operations together; where as in Wokha district where the Jhum land is more or less under individual ownership the cultivation

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areas are individually decided. Even in Wokha district in order to facilitate mutual support among the households during cultivation, the farmers make small groups and open up new *Jhum* areas in fallow lands. Photograph 2.2 depicts a typical *Jhum* field.



Photograph 2.2: A Jhum field



Figure 2.12: Changes in the number of households participating in Jhum cultivation in different villages

Due to the considerable reduction in the number of Jhumias, in Mokokchung and Mon districts many Jhum plots are not completely cleared every year. Currently more or less half of the *Jhum* plots are only utilized, so that every Jhum more or less divided into two. This increases the fallow period naturally; whereas the increasing conversion of Jhum areas into horticulture plantations reduces the fallow areas, which are left under tree cover. These are two ongoing phenomena which apply divergent forces towards increasing tree cover in the villages of these two districts. According to the India State of Forest Report (2013), the state of Nagaland has 78.68% forest cover. The state has shown a minor reduction in forest cover (273 Km<sup>2</sup>) between 2011 and 2013. The report identifies the shortening of Jhum cycle as the reason for the decrease, whereas the present survey shows that in these three districts, there is no change in the *Jhum* cycle at least during the last ten years, instead the number of *Jhumias* has reduced leading to increase in the areas under fallow in *Jhum* land. A detailed survey using GIS and Remote Sensing technologies is required to identify the impact of these two divergent forces on the forest cover.

The present project has been able to create awareness among the target communities on the necessities of conservation of natural resources and tree cover. In the present scenario of reduction in the number of households practicing Jhum cultivation, many of Jhum plots are not being preferred by the community for selection for slashing and cultivation. These areas are either difficult to access or have steep slopes etc. This opportunity has been efficiently utilized by the SLEM project to mobilize the community to set aside these forest areas as reserve forest - not to be slashed and burned for Jhum cultivation. As of now altogether 2085 ha of fallow Jhum area has been set aside by the community as reserve forest (Table 2.2). Even though most of these decisions are to be approved by the Village Council (which is the apex body of village level governance) the village council members have informed the survey team that the approval that is pending is only a formality since the community has taken the decision collectively. In some cases, these new reserve forests have obtained Village Council approval as well.

District	Village	Area of new reserve forest (ha)
Mon	Lampongsheanghah	60
	Longjang	150
	Mongsenyimti	300
Mokokchung	Lakhuni	200
	Mongchen	25
	Kupza	40
	Longsa	300
Malaka	Pongidong	500
vvokna	Коіо	500
	Elumyo	10
Total	•	2,085

#### Table 2.2: Village-wise distribution of new reserve forest

#### Jhum productivity at present

#### Crop production in *Jhum* cultivation:

19 crops have been found to be predominantly cultivated in the *Jhum* fields (refer Photograph 2.3) in the three target districts of the project (Table 2.3). Higher number of crops (N=15) have been recorded from Wokha and Mokokchung districts. The irrigation facilities provided by the project in Wokha have helped to introduce more crops in this district (Coriander, Lady Finger, Sesame) to the *Jhum* fields. 7 crops (Rice, Ginger, Colocassia, Maize, Pumpkin, Chilly and Cucumber) have been found in the *Jhum* fields in all districts. The quantity of the production of these crops widely varies between the individual *Jhum* lands within *Jhum* plots, between *Jhum* plots within villages and also within villages in the target districts.



Photograph 2.3: Crops cultivated in Jhum fields

Table 2.3: <b>P</b>	redominant	Crops U	nder Cul	tivation

Product	Mokokchung	Mon	Wokha
Rice	$\checkmark$	$\checkmark$	$\checkmark$
Colocassia	$\checkmark$	$\checkmark$	$\checkmark$
Ginger	✓	✓	✓
Maize	✓	✓	$\checkmark$
Onion	$\checkmark$	$\checkmark$	
Chilly	$\checkmark$	$\checkmark$	$\checkmark$
Brinjal	$\checkmark$		$\checkmark$
Bitter gourd	√		$\checkmark$
Pumpkin	✓	$\checkmark$	$\checkmark$
Millets	✓	✓	
Cucumber	✓	✓	$\checkmark$
Beans	$\checkmark$		$\checkmark$
Tapioca	$\checkmark$		$\checkmark$
Tomato	$\checkmark$		$\checkmark$
Potato	$\checkmark$		
Yam	$\checkmark$	$\checkmark$	
Coriander	$\checkmark$		$\checkmark$
Lady Finger	$\checkmark$		$\checkmark$
Sesame	$\checkmark$		$\checkmark$

In Mokokchung district, rice production varies from 450 Kg/ha in Mongchen village to 1680 Kg/ ha in Longmisa village and Colocassia production ranges between 60 – 200 Kg/ha. Similarly in case of Ginger, Kupza village reported a bumper production of 3000 Kg/ha whereas Longmisa could only produce 90 Kg/ha (Figure 2.13). Such variations in production has been noticed in case of Cucumber also. In Mokokchung, among all the crops, rice production is the highest. Rice is primarily used by the villagers for selfconsumption, however some of the farmers have reported selling rice within the village.





In Mon district, rice production has been observed as comparatively lower than in other districts (Figure 2.14). The production ranges between 250 Kg/ha in Jakphang village and 790 Kg/ha in case of Lapa village. Colocassia production also ranges between 300 Kg/ha in case of Leangnyu village to 1750 Kg/ha in case of Lapa village. A bumper harvest of 600 Kg/ha of Pumpkin was recorded from Hongpoi village in the district where as in other districts the harvest of Pumpkin was relatively low. This might be because of the low productivity of the *Jhum* land most community members of the sampled villages in Mon district had shown an interest to switch to horticulture and cash crop plantations.

In Wokha, the introduction of new crops like Coriander, Sesame and Ladies' Finger has been documented which was explicitly due to the interventions of the SLEM Project (Figure 2.15).



Figure 2.14: Crop Production in Mon

Rice production was found to range between 630 Kg/ha in case of Longsa village to 1200 Kg/ ha in case of Elumyo village. Colocassia and Ginger are the second largest crops cultivated in the *Jhum* fields in the district. Production of these crops ranges from 140 Kg/ha in Tsungiki village to 385 Kg/ha in case of Koio village and 120 Kg/ ha in Longsa to 350 Kg/ha in Elumyo villages, respectively (Figure 2.15).



Figure 2.15: Crop Production in Wokha

#### **Income from** *Jhum* **Cultivation:**

The income from *Jhum* cultivation has been classified into two categories in the present impact study. First category is the Average Annual Total Benefits per hectare (AATB), area which is the conversion of all the produces including rice cultivated in the *Jhum* fields to its market value and summing up the same. The second category is the Average Annual Net Cash Benefit per hectare area (AANCB), which is the monetary gain of the farmer from the sales of the surplus goods produce in the farm. The quantity of Rice cultivation is directly •••• Final Report

proportional to the extent of *Jhum* cultivation carried out by the household, which is again directly proportional to the number of people in the family. So the increase in rice production does not generally mean that the household produces a surplus to sell out, rather it shows that the household has more number of people to work in the *Jhum* fields and also to consume the produce. In Longsa village in Wokha district, the production has more or less commercialized due to the interventions of the project and the community is marketing vegetables at a commercial scale. For this village the virtual total revenue was more or less 70 percent of the price of the total yield of crops other than rice.

The AATB in Mokokchung district varies between Rs. 21,715 in Akhoya village to slightly above Rs. 348,000 in Lakhumi village whereas the AANCB of these villages ranges between Rs. 8490 in Monggsenyimti village to Rs. 138,800 in Mongchen Village (Figure 2.16). In case of Mon district the AATB varies between Rs. 27,800 in Jakphang village to Rs. 89,170 in Yuching village. The corresponding AANCB figures are Rs. 4,500 (Lampongsheanghah Village) and Rs. 20,300 in Yuching Village (Figure 2.17). In Wokha district AANCB varies ranges from Rs. 47,700 in Koio village and Rs. 157,700 in Elumyo village. The corresponding AANCB figures are Rs. 18,900 in Koio Village and Rs. 62,900 in Tsingiki village (Figure 2.18). In Longsa village the project has initiated commercial production of vegetables and its marketing, utilizing better connectivity and easy access to the village\*.



Figure 2.16: Virtual Total Revenue and Real Monetary Revenue Generated from Jhum in Mokokchung

<sup>\*</sup>A study carried out later by the state UNDP team shows deviations only in two crops - tapioca and chilly. Tapioca has not been included in these calculations as it is used for self consumption.



Figure 2.17: Virtual Total Revenue and Real Monetary Revenue Generated from Jhum in Mon



Figure 2.18: Virtual Total Revenue and Real Monetary Revenue Generated from Jhum in Wokha

#### Cost benefit analysis

Jhum cultivation is a labor intensive process. It was found that in all the districts the households are doing the agriculture by themselves wherein they have to hire the labor during the slashing period. Generally the community members help each other for slashing so that the households do not need to spend on labor. As the labor availability within the village is very limited, the community members have to sometimes pay for labor as well (especially for slashing and land preparation). In general this labor is also sourced from within the village from people who do not do Jhum. A comparative analysis of the labor input to the unit area Jhum cultivation along with the AATB and AANCB has to be made to complete the cost benefit analysis of the cultivation.

The labor input for slashing and land preparation varies with the fallow period of the land under clearance. Generally land which is left fallow for more than five years is cleared for *Jhum* cultivation. At five year fallow stage the labor intensity for clearing and slashing are higher due to thick undergrowth, whereas the cost is comparatively less for the land left fallow for longer periods. Moreover the harvest of timber and firewood are more in case of land which has been left fallow for more years. The detailed labor cost input per hectare *Jhum* cultivation is given in Table 2.4. Even though the labour input goes to a few thousand rupees, since most of the labor is carried out by the members of the households, the actual monetary input is comparatively lower than the figures reflected in Table 2.4. But this calculation is extremely significant ifor calculating *Jhum* dynamics.

		abor input.	Rs/ha	
Activity	District	5 year fallow	10 year fallow	15 year fallow
	Mon	3600	2700	2700
Slashing	Wokha	4800	3600	3600
	Mokokchung	7200	5400	5400
	Mon	45000	45000	45000
Cultivation	Wokha	60000	60000	60000
	Mokokchung	90000	90000	90000
	Mon	48600	47700	47700
Total	Wokha	64800	63600	63600
	Mokokchung	97200	95400	95400

Table 2.4: Labour input per hectare of Jhum Cultivation

All these results are pointing to the fact that *Jhum* at present is not a viable livelihood option (Figure 2.19) rather it is only a means of food subsistence for the villagers. In this background, measures for increasing the *Jhum* productivity are the important interventions which need to be carried out.





#### Increase in Jhum Productivity through project interventions

In 90 percent of the villages surveyed, tremendous and remarkable increase in *Jhum* production has been recorded. The project

interventions, mainly soil conservation activities have been found to increase rice production even up to 100 percent in Mokokchung and Wokha districts. Chilly production also has increased up to 400 percent in these districts. In Longsa village of Wokha District, Ginger production has gone up by 700 percent. Cucumber production in Mon has shown an increase of 700 percent. Similarly other crops also have shown increase in production (Table 2.5).

Table 2.5: Increase i	n Productivity	due to SLEM
interventions		

	Pe	ercentage	of incre	ease in p	production	on
Crop	Mokol	kchung	М	on	Wo	kha
	Lower	Higher	Lower	Higher	Lower	Higher
Rice	17	100	5	63	70	100
Colocassia	40	50	20	200	150	167
Ginger	43	100	50	100	150	700
Maize	50	400	33	240		
Onion	10	50				
Chilly	67	400	40	200	50	400
Brinjal	15	67				
Bitter gourd	10	50				
Pumpkin	60	200	50	150	14	150
Cucumber	20	100	60	757	5	75
Tapioca	40	150				
Tomato					20	100

It is significant to see the impact of this increase in the revenue from *Jhum* production and its direct impact in the viability of *Jhum* cultivation (Table 2.6). More than the increase in the revenue from *Jhum* cultivation, the overall impact on the viability of the practice also needs to be assessed. On an average the project has demonstrated an increase of AATB at the rates of 2%, 112% and 58% in the districts of Mon, Mokokchung and Wokha respectively. The increase in AANCB was at the rates of 8%, 206% and 69 percent in the districts of Mon, Mokokchung and Wokha (Table 2.6).

Table 2.6: Increase in Revenue due to SLEM interventions

District	% increase in Average Annual Total Benefits (Rs/Ha)	% of increase in Average Annual Net Cash Benefit (Rs/ Ha)
Mon	2	8
Mokokchung	112	206
Wokha	58	69

In all the districts, the AATB was demonstrated to increase beyond the overall labor input to *Jhum* cultivation (Figure 2.20). In simple terms the project has demonstrated that *Jhum* practice can be made a financially viable livelihood option in all the target districts.



Figure 2.20: *Impact of SLEM interventions on the financial viability of Jhum cultivation* 

#### Replication of Soil Conservation Activities

In all the sampled villages it has been found that the project interventions have led to tremendous increase in Jhum productivity. Another significant highlight of the project that has been observed is the replication of these measures by the community without assistance from the project or any other government schemes. In Mokokchung district, in 25 percent of the surveyed villages soil conservation measures have been just initiated during the last year or this year, making it still early to see the replication. Replication of the soil conservation activities have been recorded in fifty percent of the surveyed villages. Replications of measures have been carried out mostly by the present beneficiaries in these villages rather than the non-beneficiaries. The results show that replications have been carried out more or less in the same areas where soil conservation measures have been implemented through the project.

Replication of soil conservation activities have been carried out in more than eighty percent of the sampled villages in Mon district. In this district the replications have been carried out mostly by the non-beneficiaries even though the beneficiaries have also carried out replications. In Lapa village the implementation of soil conservation activities in 12 ha area through the project has been replicated in more than 50 ha area and in Hongpoi village, the implementation in 10 ha area has been replicated in more than 13 ha area in the following year. Replication of soil conservation activities has been observed in 25 percent of the sampled

villages in Wokha district where 50 percent of the existing beneficiaries and more or less equal number of non-beneficiaries are replicating the measures. Altogether, it clearly demonstrates that the rate of replication of the measures is not very high.

Out of the soil conservation measures implemented through the project such as contour bunding, half-mound terracing and trenching, contour bunding is found to be most effective. Contour bunding requires 45 man-days labor input per hectare, which is more or less three times the cost of slashing and land preparation for which the people get labor from outside the house. This initial working capital expenditure is not affordable for the farmers. Along with this, labor availability within the villages is also limited. Slashing and land preparation activities are carried out at the same time by all the farmers, leading to the fact that the limited labor force available in the village is shared. Availing labor for soil conservation measures is thus nearly impossible for all the farmers, which is the major cause behind the poor rate of replication, even though the community members clearly understand the benefits of the same.

## Improving tree and forest cover in the target areas

The project has been found to have a positive impact on improvement of the tree cover in the targeted areas through the practice of planting trees in the Jhum plots by making the practice either mandatory or voluntary, which is an outcome of the conservation awareness creation carried out through the project implementation measures. There are high variations in the number of trees which are being planted in the villages, depending on the time and labor availability for the activity. Other than the environmental benefits of more tree growth in the fallow areas these changes are also going to lead to economic benefits to the communities in the form of timber and firewood. Increased tree growth is also going to benefit the community in the form of increased soil fertility and reduced soil erosion when they initiate Jhum cultivation in the plot next time.

Fallow land is traditionally considered by the communities as the agriculture land left as forest, which can be subjected to clearance for Jhum cultivation at their own decision. The project has successfully set aside 2085 ha of land out of the Jhum area in 10 villages across three districts as reserve forest. Setting these Jhum lands as forest is based on the decision of the Village Councils. Among these three districts, the village councils are still powerful decision making bodies in Mon and Mokokchung districts, whereas in Wokha district the council has a weaker grip on land use pattern as it is more of an individual based decision there. In the present scenario Jhum lands set aside as forest areas will be protected by the village councils in case of Mokokchung and Mon whereas in case of Wokha any clearing of individually owned forest by an individual in these areas can at best invoke a fine by the council. Protecting these areas legally with the participation of the communities is a crucial step for ensuring sustainability of this highly significant impact of the project.

In precise, even though the project has demonstrated the viability and tremendous improvement in livelihood from *Jhum* cultivation through soil conservation measures, since the farmers have to invest in the soil conservation measures like contour bunding, the replication of the measures was found to be poor in the project areas. The shortage of labor along with unaffordability of the initial working capital investments are the major issues identified for poor replication. The possible solutions for this lays in the introduction of mechanization in *Jhum* cultivation. Small tiller machines can be introduced to reduce the labor input in shifting cultivation.

#### Changes in Soil characteristics

Since the project interventions have been carried out only for the last two years (at the maximum) in case of the fallow management interventions, it is too early to measure the changes in the soil characteristics. At present the soil analysis shows no significant differences between the soil of managed and unmanaged fallow areas. It is clear that the fertility of the soil of *Jhum* areas could increase from the demonstrated increase in the productivity.



#### **CHAPTER 3**

## Changes in land productivity & soil erosion rates in the three project districts before & after the project interventions

The marked changes in the productivity of Jhum land have been described in detail in the previous chapter. This chapter deals with fallow management and interventions relating to activities apart from Jhum practices.

## **3.1 Increase in cropping period and** *Jhum* cycle

The survey shows that the project has demonstrated that soil conservation activities have a positive impact on the cropping period. In all the villages where soil conservation activities have been implemented, the cropping period has increased by one or two years. Unfortunately, the increase in the cropping period has not made much impact in increasing the Jhum cycle or reducing the number of households engaged in Jhum cultivation. The reasons for drawback are both cultural as well as related to food sustainability. In the three target districts of the project, the community has divided their Jhum land into different Jhum plots. According to tradition, the community slashes and initiates Jhum cultivation every year in these plots one by one. The total length of the Jhum cycle refers to the total duration of time spanning from the day the community leaves a plot fallow to the day when the community comes back to the same plot for cultivation again. In Mon and Mokokchung districts cultivation is being done in an organized manner where the community collectively decides which plot has to be slashed every year and no one is permitted to slash an area outside the plot selected by the village council, whereas in Wokha the decision is more or less individual. During the survey the community reported that traditionally they cultivate for two years in a Jhum plot. Even though the project could extend the cropping period, due to traditional reasons the practice of opening up new plots for slashing every year could not be altered.

Rice which is the staple food of rural Naga communities is primarily sourced from the *Jhum* 

fields. During these extended cropping periods all the farmers have been found not to be cultivating paddy in the existing field, rather they continue cultivating vegetables. In order to cultivate paddy, most of the households who are carrying on Jhum cultivation in the plots where cropping period has been extended also open up new fields in the newly opened Jhum plots. During the community interaction, some of the villages have shown their willingness to experiment with the protocol of increasing the cropping period and halting slashing for a year considering the demonstrated improvement in production through soil conservation measures. For this purpose all the Jhumias will have to carry out soil conservation measures in their Jhum lands which is practically not possible since many of them will not be able to afford the initial working capital investment required for making contour bunds and other soil conservation measures. So far the project has supported only selected beneficiaries to carry out soil conservation measures.

The project has definitely had an impact in extending the cropping period of the *Jhum* cultivation but has not met with success in extending the *Jhum* cycle, as the community strictly follows the tradition of clearing new *Jhum* plots every year and carrying out cultivation in a *Jhum* plot only for two years. The project depending on the availability of resources, can experiment in one village by supporting all the *Jhumias* for soil conservation measures with a Memorandum of Understanding with the Village Council to make use of the fertility of the soil, increase the cropping phase and halt slashing for a year, the results of which can then be used to propagate the message to the other villages as well.

#### 3.2 Decrease in soil erosion

The only indicator for decrease in soil erosion in the project area is the increase in productivity. Even though standard data is available from the state about the rate of decrease in soil erosion due to soil conservation activities implemented through the project, the survey failed to identify direct evidences from the field. This data is apparently insignificant since the broad objective of increasing the productivity has been met. Some of the villages in Mon district have linked the decrease in turbidity of water bodies in the low lying areas with the decrease in soil erosion, though any concrete indicator was not available.

## **3.3 Detailed estimation of income from fallow management**

As far as livelihood generation from the fallow areas concerned, the following activities were implemented in the project villages:

- Indigenous tree plantations in the fallow areas (mostly in the second year of *Jhum* cultivation) which is also a part of increasing tree cover in the fallow *Jhum* areas. This will also result in more timber and firewood for the community at the end of the fallow period. The details of the improvement of tree cover in the *Jhum* fallow areas have already been provided in the section on the same.
- ► Converting the fallow areas to horticulture plantations using Integrated Farm Development (IFD) options in order to increase the income of the communities from horticulture plantations. This supported the activity in two way - by engaging the community more in farm labor and thereby reducing the number of households carrying out Jhum cultivation and also improving the livelihood of the communities so that farming becomes an alternate livelihood for the communities. These IFD operations have been carried out in different ways according to the requirements of the communities. In some villages like Longjang in Mokokchung and Tuimei in Mon these horticulture plantations have been established in a compact manner by converting the fallow areas in selected Jhum plots, whereas many other villages individual beneficiaries have been supported in isolated

plots. The main crops introduced in the villages as part of IFD component of the project and their demonstrated impacts on livelihood are as follows.

Among the surveyed villages tea plantations have been supported by the project as part of the IFD interventions in three villages in Mon district and one village in Mokokchung district. The tea plantation supported by the project has successfully demonstrated generation of an income of atleast Rs. 100,000 per ha. This is far higher than the average VTR of the district from traditional *Jhum* cultivation but this is less than the estimated increased average VTR for this district if the demonstrated soil conservation measures are carried out.

The benefits from the pineapple plantations have been assessed in two villages in Mokokchung and one village in Mon. The plantation has demonstrated a potential of generating Rs. 40,000 per hectare even when cultivated as an intercrop.

Orange plantations are also supported in all the three districts but these plantations' areas still need to attain the fruiting stage, so an estimation of economic benefit could not be done for the same.

Banana plantations were also supported by the project with introduction of new high yielding varieties. The plantations have demonstrated a potential of generating revenues of Rs. 180,000 per ha.

Tree Bean plantations have also been supported by the project. Each tree of tree beans is estimated to have a potential to generate a revenue of Rs. 10,000 per annum. 260 trees can be planted per hectare which has a potential to generate Rs 2,60,000 per hectare, but mostly these trees are planted as intercrop with other crops. Considering these estimates may not be realistic since high production from the plantations will flood the market with tree beans in another three years which may considerably slash the price. Other interventions like Paddy with fishery, plum plantations, Cardamom plantations etc were also supported by the project which have demonstrated increases in livelihood which

are more than the RMR per ha from traditional *Jhum* cultivation.

Providing guidance and training to the communities in better agricultural practices and soil conservation measures so that the cropping period is extended more than the contemporary time schedule and fallow period is reduced. The main objective is to retain the farmer in a single plot for greater number of years so as to prevent them from clearing new areas every year. Even though the measures have demonstrated livelihood improvement and also extension of cropping phase through this measure, the case study of Longsa village in Wokha district is a classic demonstration of the impact of the project on livelihood of the communities through this measure, clubbed with some other interventions (refer Box 1).

#### Box 1: Transformation of Longsa through SLEM

Longsa village is situated slightly higher than four kilometers from the district capital Wokha of Wokha district in Nagaland. The village has 945 households, most of which are carrying out agriculture for sourcing rice which is the staple food of the community. Among these households almost 400 households are completely depending on agriculture for their livelihood. The average revenue generated from traditional *Jhum* cultivation was roughly Rs. 13,000 per household.

In 2010 the UNDP-GEF- Government of Nagaland project "Sustainable Land and Ecosystem Management (SLEM) in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security" had initiated several trainings on the scientific management of agriculture, especially vegetable cultivation. Till then the community was cultivating vegetables for subsistence in their shifting cultivation (*Jhum*) fields. The agriculture in these villages was earlier completely dependent on rain and some water sources which are far away from their agriculture fields. During 2011, as part of the project interventions UNDP, along with the soil conservation department of Government of Nagaland constructed 15 water harvesting ponds in the village for irrigation especially during the summer and winter. Along with this six more water ponds were also constructed with the dual objectives of irrigation and fish rearing. The villagers were also given rigorous training on better practices of cultivation and management of vegetables.

Even though the initial facilities supported by the project benefited only limited number of beneficiaries, eventually other farmers also created their own water sources for agriculture. Farmers started establishing vegetable farms near water sources and managing them scientifically. Slowly the vegetable production in the village increased and using the proximity of the village to the district headquarters and also better road access, the community started marketing the produce in bulk from their farm gates. Moreover the extent of cultivation of many vegetables also increased, especially beans, which was a seasonal crop earlier, cultivated during the months of June and July, is now produced round the year.

The estimated quantity of the vegetables which moves out of the village Longsa every year and the total additional revenue generated from the business are tabulated in Table 3.1.

Crop	Average sales (Tones)	Rate (per Kg)	Total Revenue
Beans	260	40	10,400,000
Cabbage (December - February)	45	8	360,000
Cauliflower (December - February)	15	10	150,000
Brinjal (June - December)	15	20	300,000
Cucumber (Jun - August)	14	40	560,000
Pumpkin (July - September)	15	20	300,000
Colocassia (Jun - September)	68	30	2,040,000
Squash (May - December)	350	10	3,500,000
Squash Leaves (May - December)	0.5	10	5,000
			17,615,000
Total			44,037.5

Table 5.1. Vegetable Froduction in Longsa Villag	Ta	ble	3.	1:	Veget	able	Proc	luction	in	Longsa	Villa
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The community altogether now generates more than Rs. 17 Million per annum from organic vegetable cultivation and sales. 400 households are dependent on agriculture for their livelihood and involved in the bulk production and marketing of vegetables. The average income generated from vegetable marketing has increased from a nominal Rs. 13,000 to Rs. 44,000 which is more than a three fold leap which speaks volumes about the project's success.

Over all the implementation of IFD component of the project through horticulture plantation resulted in an increase in the livelihood of the beneficiaries in the range of Rs. 30,000 – Rs.160,000. It was impossible to assess the replication of the intervention since establishment of horticulture plantations were being carried out even prior to the project implementation in these villages. In one village the project has demonstrated tremendous Final Report

improvement in livelihood from Rs. 13,000 to Rs. 44,000 per annum through better management of agriculture in the areas which would otherwise have been left as fallow after *Jhum* cultivation. Even though it was not replicated in other villages this impact in Longsa Village is sufficient to demonstrate the extent of livelihood improvement possible through the interventions.



#### **CHAPTER 4**

## Changes in the quality, quantity and variety of agri-horticultural produce in the three project districts due to project interventions

In case of most vegetables, soil conservation measures have demonstrated an increase in quantity of production and quality in terms of size. As far as the impact of the increase in size on the marketability of the produces is concerned, the increase in size of Maize, Colocassia, Cucumber and Pumpkin has enabled farmers to reduce the wastage in marketing of their produces. A detailed estimation of the livelihood improvement in terms of revenue from sales was not possible in these cases. However, project interventions have improved the sales of these vegetable by 10 percent.

The increase in the quantity of production and its impact on the livelihood of agrarian communities has already been discussed earlier. Even though the project attempted the introduction of high yielding varieties in case of Banana, Maize, Ginger and Turmeric, all of these failed in gaining popularity due to different reasons. Banana production has decreased to one third over a period of four years and Maize taste was not preferred by the community. Ginger and Turmeric also did not gain popularity due to unknown reasons.

Jhum cultivation is well known for its diversity of agricultural varieties. The survey shows that altogether 11 varieties of Rice from the surveyed villages along with 9 varieties of Maize, 3 varieties of Cotton, 2 varieties of Chilly and 1 variety of Bamboo, Soyabean and Yam each, have either been lost or are on the verge of being lost (Table 8). The major reason for the disappearance of these varieties is the decrease in their productivity, changes in practices and climate change. These factors acted independently or in a cumulative manner. The project has taken measures to establish seed banks in the targeted villages to stop further erosion of agricultural biodiversity. Presently, documentation of the varieties in cultivation is being carried out and in some villages in Mokokchung district the Land Use Committees (LUC) or some SHGs are ensuring the plantation of all the existing varieties in one or other Jhum field. The project is thus demonstrating a model of protecting the agricultural diversity in Jhum fields by making the LUCs play a pivotal role in it. Overall, the model makes the entire village and the Jhum fields a seed bank rather than protecting the verities which are diminishing separately.

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District	Village	Variety	Disappeared	Decreasing	Reason	Remarks	
Mokokchung	Mongsenyimti	Bamboo/Rattan	-		No practice of spoon making from this		
Mon	Lampongsheanghah	Bean	<del></del>				
Mokokchung	Longjang	Chilly			The cultivation was not economic	Climate and soil changes made them low productive	
Mokokchung	Mongsenyimti	Chilly			Most of them were low productive	Climate and soil changes made them low productive	
Mokokchung	Akhoya	Cotton					
Mokokchung	Mongsenyimti	Cotton	<del></del>		Most of them were low productive	Climate and soil changes made them low productive	
Mon	Jakpang	Cotton					
Mon	Leangnyu	Maize	-	-			
Mokokchung	Akhoya	Millet		2	Cotton was an introduction by the British which was not profitable at all		
Mokokchung	Longjang	Millet					
Mokokchung	Lakhuni	Millet		-			
Mokokchung	Khar	Millet	<del>,</del>		Millet cultivation has gone down as the food habit has shifted to rice		
Mon	Leangnyu	Millet	2		Millet cultivation has gone down as the food habit has shifted to rice		
Mon	Jakphang	Millet		-	Millet cultivation has gone down as the food habit has shifted to rice		
Mon	Lapa	Millet	<del></del>		Millet cultivation has gone down as the food habit has shifted to rice		
Mon	Lampongsheanghah	Millet	<b></b>		Millet cultivation has gone down as food habit has shifted to rice		
Mokokchung	Lakhuni	Pumpkin		-			
Mokokchung	Akhoya	Rice	3	6			
Mokokchung	Mongsenyimti	Rice	3		Most of them were low productive	Climate and soil changes made them low productive	

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District	Village	Variety	Disappeared	Decreasing	Reason	Remarks
Mokokchung	Lakhuni	Rice		2		Climate and soil changes made them low productive
Mokokchung	Khar	Rice	2		These varieties were not very tasty and have thus lost out over the years	
Mon	Jakphang	Rice				
Mon	Lapa	Rice		1		
Mon	Yuching	Rice			The variety is tastes good but gives good yield only in the first year and yield decreases from second year onwards. This variety has to be harvested in January and the other rice in March. Thus in the land completion between these two varieties of rice, this variety loses out. Added to it, this variety is also highly infested with grasshoppers.	
Mon	Sheanghahmokok	Rice	-	Ŧ	The rice variety that has been lost used to be planted in winter. It does not grow well everywhere and very wet and cold area are required. Thus due to the climate change this variety has been lost from this village (still grown in some villages which have softer soil and colder climate), even though it was more productive.	
Mon	Tuimei	Rice	1		Community does not have that much time in hand any longer to invest in dehusking of these rice varieties due to the shift towards cash crop cultivation and are more inclined to purchase rice.	Rice varieties here are being lost due to rampant increase in cash crop production.
Mon	Tuimei	Rice		-	Community does not have that much time in hand any longer to invest in dehusking of these rice varieties due to the shift towards cash crop cultivation and are more inclined to purchase rice.	Rice varieties here are being lost due to rampant increase in cash crop production.
Mokokchung	Mongsenyimti	Soyabean	-		Most of them were low productive	Climate and soil changes made them low productive

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#### **CHAPTER 5**

## Improvements in the livelihoods of local populations, with particular emphasis on women as a direct or indirect result of the project's interventions

The livelihood benefits demonstrated by the project by and large has been stated in the earlier sections of the impact assessment document. Even though the over-all increase in the livelihood will benefit the women of the community also, the project also implemented certain measures targeting the women of the community. In order to understand the role of women in the day to day life of traditional societies existing in the villages of the targeted districts detailed interactions were carried out. Women are more involved in agriculture and marketing of the produces than men even though men voluntarily takes up responsibilities and works which require more physical strength like slashing and burning of the fallow areas, land preparation etc. The specific activities targeted



Photograph 5.1: Marketing Shed at Lampongsheanghah

towards women or significant to women, identified during the impact study were – Market sheds and support to SHGs.

Since marketing of the agricultural produce is predominantly the responsibility of the women, marketing sheds provide a platform for the women in the village itself to shelf and display the agricultural produces and market them. This saves the time and efforts of the women in marketing and also thereby increase their income.

Marketing shed constructed at Lampongsheanghah village of Mon district (refer Photograph 5.1) provides support for women from 80 households of

the village. The average income from agricultural marketing has been doubled from Rs. 1000 per month to Rs. 2000. The women-folk of the village have now started buying produces from the nearby villages and market the same as well through market shed. This in-turn supports the neighboring villages also by increasing a market of their produces. During the time the women spend in the marketing shed they also do basket making from the market sheds and earn an additional income of atleast Rs. 200 per month.

One of the major means of supporting the women-folk of the targeted community is through support to self-help groups. The project has supported self-help groups through different means. The impacts of these measures are as follows:

#### 5.1 Piggery

The pig population of Nagaland was estimated to be 698,000 (Livestock Census 2007) and more than 80% of rural households keep a few pigs under backyard system. Most of the households (70–90%) keep pigs for the purpose of fattening while some households (10 to 30%) also keep them for breeding. Pigs are imported not only from the neighboring states to Nagaland but also across the international border of Myanmar<sup>14</sup>. Researches have shown that supplementary nutrition to the pigs will both increase the weight of the rearing pigs and also the number of piglets in each delivery.

Three self-help groups in two villages out of the villages sampled in Mon district have been supported through Piggery (refer Photograph 5.2). The attempt was a failure in case of Mercy SHG in Leangnyu Village in which the rearing lasted for less than an year. In the same village another SHG (Hapang SHG) was also supported through piggery and in this case also even though the group generated a revenue of Rs. 80,000 in a span of two years, the group has discontinued the activity. In Yuching Village of Mon District (Shekoeisakhong SHG) also the piggery has failed due to high mortality of the piglets which seriously affected the viability of the project and the SHG could only generate Rs. 15,000 during a period of two years from the business.



Photograph 5.2: A Piggery

#### 5.2 Agriculture Revolving Fund (ARF)

ARF was another major support provided for the SHGs. In Mon district ARF was provided for nine SHGs in the eight villages sampled. Throughout these villages this amount has been used for providing short term loans to the members of the SHGs for different purpose with varying interest rates fixed by the SHGs. In most of the cases the loan was utilized directly for the agricultural purposes whereas in other cases the same was utilized for other domestic purpose like health care and education. The relief provided to the womenfolk of the community in terms of their financial requirements has been a boost for them, to help them find more time to generate more revenue. But a direct impact on the agriculture practice was hardly noticed. In some cases a portion of the money was kept idle in the bank account of the SHG as well.

In Mokokchung district ARF has been provided only in one village (Mongsenyimti Village) out of the villages sampled. This ARF was very well utilized directly and indirectly for developing the womens' involvement in the agriculture and marketing of the agricultural produces. The SHG is now supporting two more SHGs with smaller ARF capitals to replicate the same (refer Box 2). In Wokha also one of the SHGs in village Longsa was supported by ARF. This money is being utilized collectively for agriculture especially ginger and banana. Over a period of three years the ARF capital with the SHG has doubled and the members are receiving a steady income of more than Rs. 10,000 from the agricultural activities.

#### 5.3 Rice Mills

Rice Mills were provided for two SHGs in Mon district in villages Leangnyu and Jakphang. In both the villages the SHGs are running the mills successfully. The SHG in Leangnyu is generating an annual profit of Rs. 240,000 which is shared equally between the land owner who provided the land to construct the mill and the SHG. In Jakphang Village the SHG is generating a revenue of Rs. 200,00 per annum from the business, after taking care of the maintenance and labour charges.

<sup>&</sup>lt;sup>14</sup> V. Padmakumar, Ram Pratim Deka and Keith R. Sones (2014) A model to improve pig nutrition using local resources for market-oriented production - An impact narrative from Nagaland, India, ILRI Research Brief 13, P4.

#### Box 2: Breaking the fences of tradition - a case study on women empowerment

The traditional rules in the state of Nagaland in India are still strong, perhaps as strong as any other constitutional provision or law prevailing in India. The traditional systems and governance in the state impose an array of restrictions on women of the different tribal communities in Nagaland. Along with confining the women out of the traditional village councils – the apex decision making body in all aspects of village governance, they are not still entitled to own land in most of the areas in the state.

Till 1998, Siitsiingsola – a 32 years old lady from Mongsenyimti village in Mokokchung District of Nagaland was living a normal life like any other woman in her village. The ninth standard educated Siitsiingsola was married to an illiterate villager and was a mother of three sons and a daughter. She worked every day in the land allotted to her husband by the clan (most of the land in the village is owned by different clans (sub tribal groups), which are allotted to men of different families for carrying out agriculture), looked after her children, walked long distances to collect drinking water for the family, cooked food for all, prayed in church and slept peacefully. Every year, the village community shifts their agriculture from one place to the other – the shifting cultivation is locally known as *Jhum* cultivation. This cultivation is a sort of mixed cropping in which both food grains, vegetables and other crops are cultivated together. The land in which Siitsiingsola's family cultivated in 1998 was highly fertile and every day they got a good harvest. Many of the families in the village had other livelihood sources by that time and were unable to carry out agriculture. She started door to door sales of vegetables that year within the village for extra income, especially to meet the increasing expenditure of her children.

In another three years, she started selling her produces in the local market at Mokokchung – the district headquarters, twenty kilometers away from her village, displaying them by the roadside. The middle aged woman entrepreneur very soon identified the pulse of the local market and started shifting her sales to different weekly markets in many nearby small towns. The conveyance in the state also kept improving in the meantime, which enabled her to attempt selling her produces in a bigger town – Dimapur, which is at the border of Assam, once in a while, for better prices available there than in the local markets near her village. By this time Siitsiingsola could manage a secondhand mobile phone handset and a connection. She was earning a couple of hundred rupees from her business by 2008. The quality of the vegetables brought by Siitsiingsola to the Dimapur market caught the attention of a few vegetable wholesalers, who asked her to supply more from her village to them.

Siitsiingsola started buying vegetables from other families in the village and sending them by bus to the wholesalers in Dimapur. All the consignments were based on the demand, the orders used to reach her through her mobile phone. She had to travel to Dimapur to collect the money from the wholesalers every time, so due to the lack of sufficient capital she could only send three or four consignments in a month to the wholesalers. Siitsiingsola's income from the sales had improved her earnings, increasing them to an average of fifteen hundred rupees by now. In 2008, National Bank for Agriculture and Rural Development (NABARD), organized trainings in Mokokchung targeting the women, in order to promote the concept of Self Help Groups. Siitsiingsola attended the training and understood the scope of forming such a SHG in her village. She gathered nine other women friends and formed a SHG in the village, which was idle for many years due to the lack of any monetary support.

Even though the business was running fine, due to constraints in time required to manage the supply of vegetables and to collect payments from the wholesalers along with running her own wayside shops, Siitsiingsola started an apparel business along with vegetable marketing. On her way back from Dimapur to the village, she started bringing some clothes which were sold in the village. This was more lucrative than paying back her vegetable suppliers within the village in cash. Her earning were however still less than fifteen thousand rupees in a month. Burgeoning family expenditure and medical emergencies sabotaged the Siitsiingsola's financial situation by 2012. She fell in debt, which even though was a small amount of a few hundred rupees was unmanageable for her.

The project team of UNDP-GEF-Government of Nagaland project "Sustainable Land & Ecosystem Management in Shifting Cultivation Areas of Nagaland for Ecological and Livelihood Security" had initiated different activities in the village by the time. The leadership qualities of Siitsiingsola caught the attention of the team and her SHG was selected to be supported by an Agriculture Revolving Fund (ARF) of rupees one lakh. By this time she had persuaded the other SHG members to also open up occasional wayside shops to sell the vegetables in the district headquarter. The ARF was divided among the members of the SHG with an agreement to pay a monthly interest to the SHG. Using the share of the ARF Siitsiingsola could pay back all her debts and initiate the vegetable business again in full swing. All the SHG members also bought one piglet each worth Rupees Three Thousand using the money. Thereafter, rather than doing business individually, under the leadership of Siitsiingsola the SHG started buying vegetables from the village and selling it in the local market and also to the wholesalers collectively. All of them sold the pigs in a year for an average of eight thousand rupees per pig and bought two piglets for three thousand each. Now – after two years of availing the revolving fund from the UNDP-GEF-Government of Nagaland project, the SHG is making a profit of more than thirty thousand per month from vegetable business and all of the ten women are earning a couple of thousands per annum from piggery business too.

The profit of the SHG is after realizing the ARF with an interest from the business. The corpus fund of the SHG is now Rs. 160000/-, since the women are paying an interest of three percent per month when the money is used to do business. As a measure to ensure sustainability of the project implementation measures, the project team persuaded the SHG to support other SHGs in the village through experience sharing, guidance and in other ways. Sitsiingsola guided two more SHGs in how to market vegetables, provided market links with the wholesalers and also supported them with a smaller ARF from the corpus fund of her SHG – so the chain reaction of self-supporting initiated by the project is on.

Beyond the livelihood enhancement and support to women, the team work of the project team and the leadership of Siitsiingsola has achieved a landmark success in the history of women in Nagaland. The SHG of Siitsiingsola using the corpus fund has bought an orange farm in her village. The land belongs to the clan as in all other cases but the farm now belongs to a group of women. The enthusiasm and hard work of women with strategic and monetary support from the UNDP-GEF-GoN project has broken the age old restrictions on women in Nagaland to own land property. Rather than owning land individually they now own it as a group – a classic example of real women empowerment in the state. Siitsiingsola and her friends still did not realize the real gravity of their achievement. The women of the state are slowly raising their voices for their empowerment and rights and this small but significant achievement of the project will definitely accelerate the pace of the movement.



#### **CHAPTER 6**

Understandind and identifying progress made against project interventions such as participatory land use planning, integrated farm development etc.

#### 6.1 Participatory Planning

Land Use Committees, the pivotal point of the SLEM project, are integral components for emphasizing and initiating ecologically sustainable and participatory planning in the villages with regard to land use. Out of the 10 villages of Wokha district in which the Land Use Committees (LUC) are formed the survey team has sampled 4 villages. In case of Mokokchung district, 4 villages out of the 9 villages in which the LUCs are in place were samples and 7 out of the 9 villages in which the LUCs are formed were surveyed in Mon. A comparative Strength Weakness Opportunities and Threat analysis matrix of these LUCs is provided in Table 6.1.

At present different village level bodies exist in the villages which are functioning as grass-root level planning bodies for the program implementation through different government departments. The decision taken by the LUCs as far as the land use is concerned will be overlapping with the areas of duties and responsibilities of these institutions, especially the Village Development Board (VDB). During such a conflict the lack of legal / statutory empowerment of the LUCs are going to be one of the main causes of concern for of the same, beyond the project period.

LUC formations have been carried out either in the last year or in the current year in all these villages, so the institution has just been established and is not in a stage that is compliant for assessing its positive and negative impact in the overall planning of the land use of the village. Moreover in order to achieve the objectives behind the formation of the LUCs, the project needs to complete three more steps vis institutionalizing the LUCs to empower the same for functioning as an institution with legal or statuary validity, Capacity Building of the LUCs for carrying out sustainable and participatory land use planning in a scientific manner at the village level and Monitoring the functioning of these committees for an year to take additional corrective measures to fine tune its functioning. At this stage it is doubtful that the present project will have sufficient time to complete all these three tasks.



Photograph 6.1: Participatory Land Use Planning

Table 6.1: Loss in Agri-Biodiversity

District	Villane	Strength	Meakness	Doportunity	Threat
Wokha	Elumyo	<ol> <li>Democratic mode of formation</li> <li>Strong Leadership</li> </ol>	<ol> <li>Less number of female members</li> <li>Lack of any legal status</li> </ol>	<ol> <li>Community understands the need for organized and sustainable planning</li> <li>Existence of collective land ownership</li> </ol>	1. Conflict between interest and work area of Village Development Board
Wokha	Tsungiki	1. Democratic mode of formation	<ol> <li>No functional existence</li> <li>Lack of any legal status</li> </ol>		<ol> <li>Lack of follow up by project team</li> <li>Weak control of traditional institutions over individuals</li> <li>Individual land ownership</li> </ol>
Wokha	Koio	<ol> <li>Democratic mode of formation</li> <li>Highly determined members</li> </ol>	<ol> <li>Lack of clarity about objectives of LUC</li> <li>Lack of any legal status</li> </ol>	<ol> <li>Community understands the need for planning</li> <li>Existence of issues which are not addressed by other statutory bodies like human wildlife conflict</li> </ol>	<ol> <li>Conflict between interest and work area of Village Development Board</li> <li>Weak control of traditional institutions over individuals</li> <li>Individual land ownership</li> </ol>
Wokha	Pongidong	1. Democratic mode of formation	<ol> <li>Low female representation</li> <li>Lack of clarity about objectives of LUC</li> <li>Lack of any legal status</li> </ol>	<ol> <li>Higher number of households depending on agriculture</li> </ol>	<ol> <li>Conflict between interest and work area of Village Development Board</li> <li>Weak control of traditional institutions over individuals</li> <li>Individual land ownership</li> </ol>
Wokha	Longsa	1. Democratic mode of formation	<ol> <li>Low female representation</li> <li>Lack of clarity about objectives of LUC</li> <li>Lack of any legal status</li> </ol>	<ol> <li>High dependence on agriculture and vegetable cultivation</li> </ol>	<ol> <li>Conflict between interest and work area of Village Development Board</li> <li>Weak control of traditional institutions over individuals</li> <li>Individual land ownership</li> </ol>
Mokokchung	Chuchuyimlang	<ol> <li>Democratic mode of formation</li> <li>High female representation</li> <li>High conservation awareness among LUC members</li> </ol>	1. Lack of any legal status	1. Highly supportive Village Council	<ol> <li>Conflict between interest and work area of Village Development Board</li> </ol>
Mokokchung	Mongchen	1. Democratic mode of formation	<ol> <li>Lack of any legal status</li> <li>Low female representation</li> </ol>	<ol> <li>Good linkage with farmers as an institution</li> </ol>	<ol> <li>Conflict between interest and work area of Village Development Board</li> </ol>
Mokokchung	Kupza	<ol> <li>Democratic mode of formation</li> <li>Good understanding about means of sustainable development among LUC members</li> </ol>	1. Lack of any legal status	<ol> <li>Visible impact of decrease in ecosystem services on agricultural production</li> </ol>	1. Conflict between interest and work area of Village Development Board

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District	Village	Strenath	Weakness	Opportunity	Threat
Mokokchung	Lakhuni	1. Democratic mode of	1. Lack of any legal status	1. High level of conservation	1. Conflict between interest and work area of
		rormauon 2. Higher female representation		awareness and sustamapility among the community	VIIIage Development Board
				2. Visible impact of decrease in ecosystem services on anticultural	
				production	
Mokokchung	Longjang	1 Democratic mode of	1 Lack of any legal status	1 Necessity of sustainable planning	1 Conflict between interest and work area of
1	6	formation		due to rapid land use changes	Village Development Board
		2 Higher female representation 3 Strong leadership			
Mon	Tuimei	1 Democratic mode of	1 Lack of any legal status	1 Necessity of sustainable planning	1 Conflict between interest and work area of
		formation	)	due to rapid land use changes	Village Development Board
		2 Higher female representation			2 Administrative power concentrated in one
					person
Mon	Leangnyu	1 Democratic mode of	1 Lack of any legal status	1 Necessity of sustainable planning	1 Conflict between interest and work area of
		tormation		due to rapid land use changes	Village Development Board
					2 Administrative power concentrated in one
	-	- - -	-		person
Mon	Jakphang	1 Democratic mode of	1 Lack of any legal status	1 Necessity of sustainable planning	1 Conflict between interest and work area of
		formation		due to rapid land use changes	Village Development Board
		2 Good understanding		2 High level of conservation awareness	
		about means of sustainable		and sustainability among the	
		development among LUC		community	
		members			
Mon	Lapa	1 Democratic mode of	1 Lack of any legal status	1 Necessity of sustainable planning	1 Conflict between interest and work area of
		formation		due to rapid land use changes	Village Development Board
		2 Good female representation		2 High level of conservation awareness	2 Administrative power concentrated in one
				and sustainability among the	person
				community	
Mon	Yuchina	1 Democratic mode of	1 Lack of any legal status	1 High level of conservation awareness	1 Conflict between interest and work area of
	0	formation	2 Low female representation	and sustainability among the	Village Development Board
		2 Good understanding		community	2 Administrative power concentrated in one
		about means of sustainable			person
		development among LUC			
		members			

Threat	1 Conflict between interest and work area of village Development Board 2 Administrative power concentrated in one berson	<ol> <li>Conflict between interest and work area of village Development Board</li> <li>Administrative power concentrated in one person</li> </ol>	<ol> <li>Conflict between interest and work area of village Development Board</li> <li>Administrative power concentrated in one person</li> </ol>
Opportunity	1 High level of conservation awareness and sustainability among the community	1 Necessity of sustainable planning         due to rapid land use changes         2 Existence of strong canal system	1 High dependence on agriculture and vegetable cultivation
Weakness	1 Lack of any legal status 2 Low female representation	1 Lack of any legal status 2 Low female representation 3 Lack of clarity about objectives of LUC	1 Lack of any legal status 2 Low female representation
Strength	<ol> <li>Democratic mode of formation</li> <li>Good understanding about means of sustainable development among LUC members</li> </ol>	1 Democratic mode of formation	1 Democratic mode of formation
Village	Lampong- sheanghah	Hongpoi	Sheanghahmokok
District	Mon	Mon	Mon

# Impacts on vulnerable and marginalized sections of the community, on gender and on traditional institutional structure, if any

In the traditional and modern social systems which existed and continue to exist in the state of Nagaland, there are no cast or clan hierarchies prevailing. The study has documented the traditional and contemporary culture and social systems with regard to land ownership, inheritance of properties and village administration along with customs and ceremonies associated with marriages and death. Nowhere in these has any element of social marginalization been observed, other than gender based marginalization. Women are not permitted to own and inherit properties other than ornaments and utensils and they are not part of administrative decision making. Even though at present women are part of village level planning bodies like VDBs in all the surveyed villages, they are not permitted even in the remises where the Village Council meetings are carried out. The project has made some breakthrough in overcoming these elements of marginalization of women in society (refer Box 2).

Women in Nagaland have yet to establish their political identity beyond their political visibility as voters. Neither the Naga HOHO nor the village councils have women representatives. Expression of political consciousness of women in the state by participating in the elections by casting votes also shows mixed trends during the last 20 years. From 1974 to 1989 the polling percentage of women voters in the states have been behind that of men, whereas between 1989 to 2003 in three consecutive elections the voting percentage of women voters were ahead of men and the trend again reversed in 2009 and 2013 elections<sup>15</sup>. Studies show that some of the barriers to women are self-imposed, in that women simply lack the confidence and interest to engage in politics. The other impediments are time and economic constraints and the prevailing political environment which has deteriorated in terms of ethics and values over the years<sup>16</sup>.

**CHAPTER 7** 

The participation of women in the planning and formation of the LUCs in a democratic manner is in fact a step towards the removal of mental block among the communities that "development planning is not womens' job". In many LUCs the women are actively participating in the decision making process and there are LUCs where the women membership overshoots the total number of men in the committee. The project has excellently demonstrated the means of real empowerment of women in the Mongsenyimti Village of Mokokchung district, breaking the traditional barrier of land ownership for women which they collectively overtook using support from the SLEM program. As far as the women empowerment in the state is concerned this is a historical leap and a landmark success for the SLEM project.

<sup>&</sup>lt;sup>15</sup> Moamenla Amer (2014) Electoral Dynamics in India: A Study of Nagaland, Journal of Business Management & Social Sciences Research 3(4), 6 – 11.

<sup>&</sup>lt;sup>16</sup> Moamenla, 2009 'A Record to Beat', Nagaland Post, Vol.XIX (141)



## CHAPTER 8 Documentation of traditional customs and practices

18 villages have been surveyed for documenting the customs and practices prevailing among communities in detail. The main objective of this exercise was to understand the social systems prevailing in the targeted villages and also to identify the presence of any socially marginalized groups.

#### 8.1 Village councils

The village councils in the state are legally empowered by Nagaland Village Council Act 1978. The strength of the village councils in the villages of Mon district varied from 9 - 45. The selection of the members is unique in each village. In 3 villages the selection of the members is based on representation from different clans and in another three villages the representation was found to be from different Morungs (families) and in one village the selection was based on the qualities of the individual beyond the clan or morung to which the person belongs. In two villages the tenure of councils were found to be unlimited where the members were replaced on voluntary retirement of the existing members or whenever the performance of a member was found to be poor. In all the villages in Mon District the tenure of the Village Council Chairman was 5 years. In one village the chairmanship was found to be rotated among the clans in every term of the council and two villages had minimum and maximum age limits for the members.

The strength of the village councils in Mokokchung district were found to range between 8 to 40. Except for one of the sampled villages where the selection of the members was based on the merits of the candidates beyond the clan representations, in all other villages the members of the council were representatives of different clans. The tenure of the council also varied from 5 to 30 years whereas the chairman's tenure was 5 years. In one village the chairmanship was being rotated among the clans within a total tenure of 30 years of the council. No age limits were observed in these villages of Mokokchung District to qualify to be a member.

In Wokha District the strength of the village councils varies from 20 to 40 members. The selection of members is mostly clan based. In one village it was reported to be based on representation from a fixed number of households. In all sampled villages the tenure of the council and chairman was 5 years.

#### 8.2 Marriages

Even though at present customary marriages are not in practice, the study has documented traditional marriage practices prevailing in 18 villages in the three targeted districts. One common factor noticed in these villages was that marriages within the clans are prohibited. Among the Konyak tribe the king (*Angh*) is permitted to marry many girls from the village. Other than this no signals of socially approved polyandry or polygamy is observed. Different marriage customs which prevailed in the villages are provided in Table 8.1.

#### 8.3 Death and inheritance of property

Among the Konyak tribe, the dead body was allowed to decompose on trees and after a period of time the skull was removed and buried separately with separate customary functions. Among the Ao tribe the dead body was smoked and rolled in bamboo mats and kept on trees. In some villages the body was kept in the house for a specific mourning period which is different for men and women. In the villages sampled in Wokha district, generally six-day mourning was carried out in case of a male and five days in case of a female. The sacrifice of a chicken or pig also

occurred in association with the death. The bodies were either buried or cremated.

In those villages where the individual land property system prevails the property of the dead person is inherited by the sons and that too as is decided by the eldest son. No land property can be inherited by the daughters. In villages where the land belongs to the clan (community) and every member is allotted agricultural property by the clan the property goes back to the clan after death. Ornaments and household vessels are inherited by the daughters.

#### 8.4 Gender discrimination

Even though in general the communities in the sampled villages do not allow women to inherit or own properties individually and join social and parliamentary leadership, there is no other gender discrimination between boys and girls in the family. All political parties have their women wings in all villages and women are actively involved in political work too. Regarding the question of allowing women to be village council members in the future, many communities have shown positive responses which is a clear signal of the waves of societal changes which are prevailing and building up across the villages in the state.

District	Village	Tribe	Marriage
Mon	Tuimei	Konyak	Marriages cannot occur within the same clan. Traditionally the community had a system of child marriage, wherein the parents used to decide the match, depending on each other's financial conditions. No system of dowry prevails.
			Angh marriage: The eligible bachelor angh has to marry a girl from another angh family. This bride will be the queen. The first son of this queen will be the next angh. Within the village, the angh marries 5-6 times. These wives can never be the queen and are involved in managing the agricultural land of the angh.
Mon	Leangnyu	Konyak	Child marriages were prevalent earlier, but the system is now discontinued. This village had a class system earlier, wherein the higher class could only marry among the higher class and similarly for the lower class. There was no system of dowry. The parents of the bride used to give her gifts, but these could never be land or property.
			Angh marriage: The eligible bachelor angh has to marry a girl from another angh family. This bride will be the queen. The first son of this queen will be the next angh. Within the village, the angh marries 5-6 times. These wives can never be the queen and are involved in managing the agricultural land of the angh.
Mon	Jakphang	Konyak	In the traditional system, the father of the boy sends a message to the girl's family for a prospective marriage. If the girl's family agrees on the same, marriage is solemnized. Only one wedding feast is given to the village. The groom's family has to give mithun/pig/poultry to the bride's family, depending on what they can afford. Polyandry or polygamy is not permitted. In case a woman becomes widowed at a young age, she can marry the younger brother of her departed husband, if he is unmarried.
			Angh marriage: The eligible bachelor angh has to marry a girl from another angh family. This bride will be the queen. The first son of this queen will be the next angh. Within the village, the angh marries 5-6 times. These wives can never be the queen and are involved in managing the agricultural land of the angh.
Mon	Lара	Konyak	Traditionally, marriage used to occur at the age of 30 years. Marriages used to be fixed in childhood earlier. In order to fix the same, a cloth touched by the girl child used to be exchanged with a cloth touched by the boy child. This was the traditional method of engagement. Polyandry or polygamy is not permitted. In case a woman becomes widowed at a young age, she can marry the younger brother of her departed husband, if he is unmarried.
			Angh marriage: The eligible bachelor angh has to marry a girl from another angh family. This bride will be the queen. The first son of this queen will be the next angh. Within the village, the angh marries 5-6 times. These wives can never be the queen and are involved in managing the agricultural land of the angh.

#### Table 8.1: Traditional marriage customs

District	Village	Tribe	Marriage
Mon	Yuching	Konyak	Traditionally, marriages used to be fixed by parents. Marriages used to happen among families of the same economic level. The presence of a witness is essential in a marriage. As part of the engagement, a dao used to be given by the groom's family to the bride's family. In case the engagement broke, the dao had to be returned to the groom's family. There is no system of dowry. The first daughter receives all the ornaments on her wedding.
			Angh marriage: The angh announces the marriage of the future angh (his son who will become angh after his death). All the villagers sit together and decide on an eligible girl for him from another angh family of another village. This marriage, once solemnized leads to the next queen. This girl will be the next queen. Her first son will be the next angh.
			From within the village, the angh choses 3-4 girls who will also be the wives of the future angh but can never be the queen. These girls work in the field of the angh and their sons will never be the next angh. The sons from wives other than the queen are given houses within the village and settled.
Mon	Lampongsheanghah	Konyak	Marriages traditionally used to be decided by the parents. A spear/dao used to be sent by the boy's family to the girl's family along with the marriage proposal. If the proposal was accepted by the girl's family, they used to keep the spear/dao. In case the engagement broke, this spear/dao used to be returned back to the boy's family. The community had no particular day for marriage. The practice was such that the bride had to come to the groom's field and work there, which was considered as the marriage, following which a feast was given to the village community. Dowry system does not prevail even today. Gifts like necklace, dao, baskets etc are given to the bride by her family. In case of a divorce due to the fault of the groom, the bride's family imposes fines on the groom's family (in the form of agricultural land, livestock). However, if the divorce is due to the fault of the bride, no such fines are levied.
Mon	Hongpoi	Konyak	Angh marriage: The eligible bachelor angh has to marry a girl from another angh family. This bride will be the queen. This is the first marriage of the angh and the first son of this queen will be the next angh. Within the village, the angh marries 5-6 times. These wives can never be the queen and are involved in managing the agricultural land of the angh. These marriages can happen only after the first marriage, with the queen. Traditionally marriages happen between families within the village. The boy has
			to present a bettlenut leaf to the girl's family as his marriage proposal. If the same is accepted by the girl's family, marriage is solemnized, wherein the bride carried bundle of firewood and goes to the groom's house. The groom has to give a dao and a spear to the bride's parents. There is no practice of dowry.
			Angh marriage: The eligible bachelor angh has to marry a girl from another angh family. This bride will be the queen. The first son of this queen will be the next angh. In case no son is born from this queen, angh will marry again from another angh family of another village and the first son born from this second queen will be the next angh. Within the village, the angh marries 5-6 times. These wives can never be the queen and are involved in managing the agricultural land of the angh. At times, these girls are also brought by the angh by force. These can however only be unmarried girls.
Mon	Sheanghahmokok	Konyak	In the traditional system of marriage, the boy's family, after consultation, sends a messenger to the girl's family along with a dao and a spear. Once the girl's family agrees, they accept the dao and the spear and send the acceptance through the same messenger. To formalize the marriage, the girl comes to the boy's field and works in the agricultural field for the day and then in the evening starts living in the boy's house. No system of dowry exists. Marriage can occur only among different clans and not within the same clan. Polygamy was accepted earlier but is not accepted.
			Angh marriage: The eligible bachelor angh has to marry a girl from another angh family. This bride will be the queen. The first son of this queen will be the next angh. Within the village, the angh marries 5-6 times. These wives can never be the queen and are involved in managing the agricultural land of the angh.

District	Village	Tribe	Marriage
Mokokchung	Lakhuni	Ао	In the traditional system of marriage, the proposal used to be sent by the parents of the groom to the parents of the would-be bride. In case the girl's family accepted the same, the boy would then have to come and work in the house of the girl for 5-6 years, following which only the marriage occurred. There is no avotate of down. A facet for the active will be to be sent by the girl's family on the
			day of the marriage. Marriages are prohibited within the same clan. Otherwise there is no canal hierarchy and marriages are possible between any clans.
Mokokchung	Mongchen	Ao	In the traditional system of marriage, the proposal used to be sent by the parents of the groom to the parents of the would-be bride. In case the girl's family accepted the same, the boy would then have to come and work in the house of the girl for 5-6 years, following which only did the marriage occur. There is no system of dowry. A feast for the entire village is hosted by the girl's family on the day of the marriage. Marriages are prohibited within the same clan. Otherwise there is no canal hierarchy and marriages are possible between any clans.
Mokokchung	Khar	Ao	Traditionally marriages used to be decided by the parents. Once the parents discussed the same and they agreed to the marriage, the parents of the boy would go to the river and fish. This fish would be given to the girl's parents on the day of the engagement. The boy would have to construct a new house for the new couple. In the month of May, during Moatha festival, marriages occur. Even after the marriage, the newly wed couple does not stay together for 3 months. During this time, the boy stays in Arijo, boy's hostel and the girl stays in Zeki, girl's hostel. From the month of August, the newly wed couples begin to stay together.
Mokokchung	Longjang	Ao	Marriages within the clan are prohibited and lead to outcasting and penalty in the form of a pig. Traditionally marriages were fixed after discussion among the parents. Girls do not have the right to select or deny any proposal but their families enjoys this right.
Mokokchung	Кирza	Ао	No marriage is permitted within the same clan. Traditionally the engagement period was 3 years during which the boy would have to work in the house of the girl. Traditionally marriages were decided by the parents and the girl and boy had no role in the same. When the boy's family would go to girl's family with the proposal, they had to cook fish and take it for the girl's parents.
Wokha	Pongidong	Lotha	The boy's parents approach girl's parents with a marriage proposal. If the girl's family agrees to the same, then for one year the boy does work like wood cutting etc for the girl's family, after which in the second year the marriage is solemnized.
Wokha	Koio	Lotha	Parents of the boy and girl meet and discuss the matter. If they agree to the marriage then the boy does labour work, firewood collection etc for the girl's family for 1 year, following which on a pre-decided date the girl comes to the boy's house.
Wokha	Elumyo	Lotha	If a girl and boy like each other then the eldest from the boy's family discusses the matter with the girl's family. On acceptance the boy has to give 3 cows and 4-5 pigs to the girl's family for a feast. In order to bring the bride to the groom's house, bamboo is cut into small pieces and dried. These are lit in the evening and the girl is brought home in the light of these bamboo torches.

## CHAPTER 9 Significant observations and suggestions

The overall observations and suggestions of the project impact evaluation team are summarized in this chapter. A socio economic impact evaluation is more or less related to the SLEM project outcome. 1 - 'Strengthening the policy, regulatory and institutional environment in support of *jhum* agroforestry systems', in which the demonstrated means and learnings of improving the ecological and livelihood scenarios should move to a policy platform as initiatives to be implemented all over the state. The overall scenario is summarized in Figure 9.1.

In precise, core scientific studies need to be carried out to understand the dynamics between the two divergent forces acting on the extent of *Jhum* cultivation and fallow forest areas – reduction in *Jhum* areas and conversion of *Jhum* areas to settled agriculture areas without fallow period.

The project has demonstrated and identified livelihood improvement options through Jhum as well as other means. At present, the demonstrations are scattered across the target districts that need to be tested in a comprehensive manner. Even within the villages soil conservation measures have been provided only to selected beneficiaries, which is a bottle neck in taking a collective decision to extend the cropping phase and Jhum cycle. Along with it, the present study has identified that there is a requirement of enormous labor and working capital input to carry out soil conservation activities which need to be addressed. Since in all the villages the land preparation is carried out in a very short span of two months, managing such labor force within the state will be highly impossible for replication of the demonstrated soil conservation measures across the state.



Figure 9.1: Diagrammatic depiction of the overall scenario

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Reduction in *Jhum* practice in terms of area and also the number of households participating in it may affect the food security of the communities when more economically lucrative alternate livelihood measures are introduced. Along with this, institutionalizing, capacity building and monitoring of the LUCs needs to be carried out for the sustainability of the project and LUCs. Establishing a financial framework for sustainable functioning of LUCs and participatory planning for improvement of livelihood and biodiversity (including forest cover) is another requirement necessary for ensuring the sustainability of the project.

The suggestions can thus be summarized as:

- Initiate the second phase of the program selecting two – three villages per district to implement all the successfully demonstrated livelihood enhancement and ecosystem conservation options of the present phase.
- All the households in the selected villages need to be benefitted from the program wherein the options can be identified in participatory manner through LUCs.
- The village councils should be mobilized to experimentally halt the slashing for one year if livelihood improvement is significant.
- In order to make the soil conservation measures time efficient and lucrative, suitable mechanization needs to be introduced (tillers etc.).
- The LUCs should be aware of food sustainability and need to decide the number of households to be engaged in *Jhuming* / minimum area to be under *Jhum* every year.
- Institutionalizing, capacity building and monitoring of the LUCs needs to be carried out in order to avoid conflict between the other administrative / development bodies in the village the option of transforming BMCs as LUCs or vice versa may be considered, with necessary changes in the state biodiversity rules.
- Establishing a financial framework for sustainable functioning of LUCs and participatory planning for improvement of livelihood and biodiversity (including forest cover) needs to be developed.

- According to prevalent practices, tree covered fallow land is the forest in agricultural area maintained for regaining land fertility.
- Even though these growing primary forests are acting as carbon sinks, the benefits in terms of carbon sequestration after the slash and burn are not known.
- When the villages set aside large tracts of their Jhum fallow areas as forest reserves, the leakage of carbon through slash and burn is also sealed.
- An accurate measurement of improvement of forest cover on behalf of the forest reserves, which is due to the change in practices (especially participatory planning) needs to be measured and extrapolated for the entire state.
- The result of such study may lead to a larger REDD+ program to ensure sustainable financial frameworks to support participatory land-use planning and livelihood improvements.



