

**EcoHimal Nepal**  
**Sustainable Tree Cropping Programme**  
**Narrative Progress Report**  
**1<sup>st</sup> July, 2016 to 31<sup>st</sup> July 2017**

**A. Summary**

The project has been implemented since 1<sup>st</sup> July, 2016 with financial support from The Glacier Trust (TGT), UK in Deusa and Waku Village Development Committees (VDCs) of Solukhumbu district to promote commercial high value cash crops and tree cropping. The project has explored the potential benefits of tree cropping as highly suited solution for the betterment of local livelihoods and adopt with climate change effects.

To compensate the food insufficiency, nutritional insecurity, adopting climatic variation and following mitigation measures, the project has been focusing to shift agriculture from traditional cereal crops to high-value cash crops farming. The marginal land holding farmers in Deusa and Waku VDCs are encouraged towards small scale commercial farming to improved livelihood. In order to promote marginal land as source of income generation, local farmers have been oriented and trained on tree cropping. Long term income generating and less labor intensive farming like coffee, nuts, and fruits are recommended to lead farmers as role model, so that other farmers can replicate.

Integration of trees into agricultural systems and agricultural diversification for adaptation to climate change has been highly prioritized in both VDCs. Agricultural diversification initiatives have great benefits for the delivery of ecosystem services, adaptation to climate change-related stresses, and the productivity of agricultural systems. In future, the cultivated plants (fruits and cash crops) will be the sources of income that will reduce the vulnerability of households to climate change-related stresses and lessened the threat supporting livelihoods.

**B. Objectives Achieved:**

**Overall Goal**

**Sustainable rural livelihoods through the promotion of tree cropping and organized marketing of the produce**

The project measures are set to reduce poverty, hunger promoting inclusive growth and sustainable livelihood in rural areas such as commercial tree cropping. Well-planned tree-cropping promotion in small-scale farm land can help to reduce its dependency on outside assistance. Once invested and starts production, it lasts for long with less hard work and tilling/ excavating of land. The project is focusing on removing barriers (especially climatic conditions) to enhance the contribution of forest and trees to sustainable livelihoods.

**Specific Objectives:**

**To raise families out of poverty through the promotion of tree crop production and the professional marketing of the produce**

The project has empowered and facilitated local communities for land management and regenerate trees plantation. They have been made aware on inter - cropping of undervalued indigenous tree species with high value plants species. Agro- forestry and tree

cropping has been promoted to raise small farm holders out of poverty with commercial “Plantation outside Forests” approach.

At total, 456 local households have been trained and oriented on various tree cropping techniques and practices like:

- Climate change and plantation
- Organic farming methods
- Applying intercropping technology
- Tree cropping technologies
- Pest Infestations and control (organic pest management)
- Market advice and products processing
- Bio-Incentive plantation techniques

### **To capacitate farmers on tree cropping technology and its extension and promotion**

Local farmers have been skilled with tree cropping technologies with the purpose of benefiting them and increasing farm productivity in terms of yield and management efficiencies. Conducting practical demonstrations at field level, technical skills in tree crop production and management practices have been shared to local farmers.

Local households have been made capable enough to choose different trees for their farmland and have developed their own set of criteria for choosing what tree species to plant. They have been aware on on-farm tree diversity for the sustenance of their livelihood. Nuts, fruits, fodder and other high value plants have been promoted for plantation in their farm land.

The project organized “Farmers to Farmers Visit” for the households interested in tree-cropping, provided training, technical and material support, encouraged farmers especially women farmers to have association with agriculture groups and to assist one another in rising plants and protecting trees on farm.

As a model, promotion of tree cropping has been done through 28 lead farmers (21 male and 7 female). They have been practicing and promoting tree cropping technologies and demonstrating for other farmers. The tree cropping area as per the farmer’s guess is about 5.15 hectare. The average is taken 4X6 meter per plant, which might not be similar for all plants but it gives the rough idea of the cultivated land. (Detail of Lead Farmers is in Annex A)

The agro-forestry and tree cropping technologies practiced in Deusa and Waku have been extended and promoted in other neighboring VDCs. Satellite nursery technologies have been replicated in Tinla VDC of Solukhumbu. 12 farmers are engaged in satellite nursery establishment.

### **C. Outcomes/Results Achieved:**

1. **Approximately 200 farmers trained in tree crop production and supplied with appropriate tree crop planting materials.**

During the reporting period, 456 local farmers have been trained in tree crop production technologies (organic farming methods, intercropping, pest Infestations and control, coffee farming, bio-incentive plantation). The details of trained local farmers are:

**Table 1: Training and Orientations to local farmers**

S.N	Particulars	Participation in Farmers' Field School			Remarks
		Male	Female	Total	
1	Orientation on Climate Change	72	55	127	
2	Training on Organic Farming Methods	40	42	82	
3	Applying intercropping technology	9	6	15	
4	Local Lead Farmers	21	7	28	
5	Training on Pest Infestations and Control	26	16	42	
6	Participation in Market Advice Workshop	24	5	29	
7	Coffee Farming Technologies	21	7	28	
8	Training on intercropping farming technologies	35	38	73	
9	Training on Bio-Incentive Plantation	26	6	32	
<b>Total</b>		<b>274</b>	<b>182</b>	<b>456</b>	

Detail of training is in Annex A)

We are happy to be part of training on Macadamia farming on 14 Chaitra, 2073 (27<sup>th</sup> March, 2017). We gained technical knowledge and skill on nursery establishment especially about grafting. We learned about right skills of seed showing, rootstock and scion management, grafting technique etc. of Macadamia. We have been aware that grafted seedling is more productive than the seedling from produced from seed. In addition, we knew about value of health and straight root rootstock and its importance in growth of tree and production. It was great pleasure that we saw a video documentary on Macadamia farming in Australia.

Dillisher Rai, Deusa 7

Prior to seedlings distribution, local farmers of Deusa and Waku were trained in tree crop production technologies and its aspects. Two lead farmers Mr. Amar Rai and Dillisher Rai, were called to Kathmandu and has been trained in grafting technologies, seedling production, importance of grafted seedling and seedling produced through seed of Macadamia nuts at Everything Organic Nursery, Patlekhet, Kavre. The training was organized by Helvetas in coordination with Everything Organic Nursery. We have requested for our participation and called 2 participants from Solukhumbu. After the Grafting training they were provided sample seedlings of Macadamia and have planted in their farmyard.

**2. About 30,000 tree crop seedlings planted.**

Coordination with different nurseries and physical observation of few of them was carried out prior to seedlings purchase. From Kavre, Lalitpur and Patan, 193 seedlings of nuts and fruits were purchased and transported to Deusa. Plants were distributed to local farmers for piloting their appropriateness and feasibility in the area. The local farmers have intercropped those seedlings especially in coffee yard. The details of purchased and transported seedlings are as follows:

**Table 2: Details of Seedlings Purchased**

S.N.	Purchased Items	From Where?	Quantity
1	Apple_Golden Dorsett	Everything Organic, Kavre	3
	Apple_Chenango Strawberry	Everything Organic, Kavre	12
2	Picanut	Everything Organic, Kavre	0
3	Macademia	Godawari Nursery, Lalitpur	25
	Macademia	Love Green Nursery, Kavre	30
4	Avocado	Love Green Nursery, Kavre	30
	Avocado	Patan Nursery, Lalitpur	3
5	Lemon	Love Green, Kavre	20
	Lemon	Everything Organic, Kavre	10
6	Almond	Godawari Nursery, Lalitpur	40
7	Muntala	Buddha Nursery, Kavre	20
<b>Total</b>			<b>193.00</b>

In addition, 21207 seedlings were distributed and planted by local farmers in coordination with Deusa Agro-Forest Resource Center (DAFRC), District Forest Office (DFO), Salleri and Regional Horticulture Center (RHC), Salleri. In total, 21400 seedlings were planted by 246 local households in their marginal land and have intercropped with coffee and orange plants in about 71.33 hectare land. ([Detail of Seedlings Distribution and plantation is in Annex A](#))

#### **D. Activities carried out:**

##### **❖ Assessment on existing tree crop farming in both VDCs**

With the initiation of the project, primary survey and identification of cash crops production areas was carried out by the agriculture technician. Observation of existing cash crops production areas and discussion with cash crops producing farmers was conducted in coordination with DAFRC. The detail assessment will be carried out to verify the data in 2<sup>nd</sup> phase of the project.

##### **❖ Institutionalization of farmers groups**

13 agriculture groups (7 in Deusa and 6 in Waku) for cash crops production have been formed /reformed. After formation/reformation, they have been oriented on rules and regulations of institutions. The members have been trained in "Go Green" promotion and supplied with the seedlings.

❖ **Establishment of sound linkages with relevant district line agencies**

The linkages of local farmers with district line agencies especially with Agriculture Service Center, Nele, DFO Salleri and RHC, Salleri has been established. Frequent visits have been done by farmers in district line agencies for seed, seedlings request and technical support. Especially lead farmers have been regularly in touch with technical resource person for technical ideas.

❖ **Physical upgrading of the AFRC and hiring of one project dedicated staff**

Deusa Agro-Forest Resource Center (DAFRC) has been equipped with solar lighting and solar hot water system. Solar panels were purchased and transported from Kathmandu to Deusa and installed. Likewise, Mr. Hari Kumar Karki has been assigned as senior agriculture technician to implement STC activities through DAFRC.

❖ **The undertaking of market and value chain research and surveys to identify most profitable tree crops for Solukhumbu district.**

❖ In collaboration with Helvetas Swiss Incorporation Nepal under Bhutan Mountain Hazelnuts project, seedlings of hazelnut have been hardened and under plan to plant in farmyard with in August, 2017. 286 seedlings were provided by Bhutan Mountain Hazelnuts project for practical research and piloting. Out of 286 seedlings, 233 are active and the layouts of land have been prepared.

❖ The project staff, Mr Keshab Rai, was trained by technical expert of Bhutan Mountain Hazelnuts project in seedlings hardening. Recently, project manager, Mr. Narayan Dhakal participated in field training organized by Bhutan Mountain Hazelnuts project in Daman, Makawanpur. The training was focused on seedling plantation, orchard management, layout and orchard mapping. After the training Narayan has oriented staff member on hazelnuts plantation layout, orchard management and mapping.

❖ In addition, 200 hazelnuts seedlings (including 8 pollinizers) have been provided to EcoHimal Nepal by Bhutan Mountain Hazelnuts project to plant in Deusa. In total, 433 hazelnuts seedlings will be planted in Deusa. Research will be done on its growth and adoptability in Deusa.

❖ Study on potential areas for cash crops plantation was carried out during the initial phase of the programme. Technical ideas after feasible study have been shared to programme management by the agriculture technician. In addition, interaction with coffee farmers has been done to assess their technical knowledge on coffee farming.

❖ **Procurement of seedling materials and production of a wide variety of the most suitable species for the two target VDC.**

To promote income generation and "Go Green" from the use of marginal land, seedlings of fruits, nuts, forest trees, fodders and forages have been distributed to local farmers. 21,400 seedlings of have been distributed to 246 local farmers of Deusa and Waku. DAFRC distributed wide varieties of seeds of forage and fodders for seedling production in cooperation with District Livestock service office.

- ❖ **Training of at least 200 farmers in all aspects of tree crop production, through nursery management, land selection and preparation, nutrients requirements and crop management and special aspects of each species selected by the farmers**

In total, 456 local farmers have been trained in:

- ❖ Climate smart tree cropping techniques
- ❖ Organic farming methods
- ❖ Intercropping with coffee farming
- ❖ Intercropping technologies
- ❖ Bio-incentive plantation
- ❖ Pest Infestations and Control
- ❖ Products in market

Trainings on intercropping farming and tree cropping system have been conducted in the project areas with the objective of increasing the total production per unit area and time, to increase on-farm income. The participation of trainees was mainly focused from coffee production potential areas.

The training on intercropping farming mainly of cash crops and vegetables as well as coffee and nuts was conducted. They were educated on double benefits from crops combination and encouraged for intercropping. The farmers were oriented on land utilization and reasonable profits from their limited lands with the combination of multiple crops.

#### Conduction of three days training on coffee farming technologies to lead farmers

3 days long coffee farming training was conducted in Deusa VDC by EcoHimal Nepal in technical facilitation of Helvitas Nepal and in coordination with Deusa Agro-Forest Resource Center. The training was facilitated by Mr. Bhola Shrestha – Coffee specialist, Helvitas Nepal. The training was held in Deusa-6 from 6<sup>th</sup> to 8<sup>th</sup> March, 2017 for 28 local farmers of Deusa VDC.

The objectives of the training were:

- 1) to understand the appropriate environment for coffee plantation
- 2) to understand the management of coffee plantation for greater production
- 3) to produce high quality organic coffee for commercial sale
- 4) to be able to make/manage bigger coffee garden
- 5) to work in group/cooperative for economic benefit of poor families
- 6) to conserve soil and environment with creation of organic coffee gardens and promoting Culture of organic farming
- 7) to utilize the marginal lands.

The contents of the training were:

- ❖ Coffee farming history in Nepal
- ❖ Present situation of Coffee farming in Nepal
- ❖ Market of Coffee products
- ❖ Coffee farming technologies
- ❖ Quality coffee production and processing

- ❖ Required environmental conditions for coffee plants
- ❖ Varieties of coffee and suitable coffee varieties in Deusa
- ❖ Diseases and insects control in coffee farming
- ❖ Liquid manure preparation and its use

In addition the training has covered about coffee seedling production and orchard management. Trainees were enthusiastic to learn the economic aspects of the coffee.

Mr. Shrestha found that environment of Deusa is perfect for coffee plantation and could produce good quality coffee. To maintain the quality sincere effort from farmers is prerequisite for the initial years. He suggested farmers to plant coffee seedlings near their houses and cattle sheds so that plants get enough manure and families also could take good care of young plants. These plants are vulnerable to severe cold in the first winter of plantation. Provision of simple shed for each seedling is needed to protect from cold. The local farmers learnt about organic pesticides preparation to protect plants from diseases and insects.

❖ **Field extension and supervision of orchard and plantation development.**

Tree cropping techniques and practices have been shared to the farmers of neighboring VDCs by trained farmers as well as our agriculture technicians. A model satellite nursery on tree cropping techniques has been established in Tingla (nearby VDC) and local farmers of Tingla have been trained and oriented on satellite nursery establishment. Our agriculture technician has been supervising the nursery development and has been providing feedbacks and technical inputs.

❖ **Establishment of satellite nurseries for tree crops seedlings production.**

5 satellite nurseries (3 in Deusa -Sola Hang Rai, Youba Raj Rai, Parvati Rai and 2 in Waku-Dal Bahadur Rai, Harka Bahadur Rai) have been established. 3 former nurseries (Dilli Sher Rai, Ambar Rai and Raj Kumar Rai) are under support as satellite nursery even though those nursery are not really satellite. This year STC has purchased seedlings from those three nurseries and distributed to farmers. While establishing, the farmers were trained on tree cropping, nursery establishment, care and seedlings production. Seedlings purchase for project area was promoted buying the seedlings from 3 local satellite nurseries. The satellite nurseries owning farmers have generated income from the sale of the seedlings produced.

❖ **Capacity building of farmers on pest management and diseases control**

42 local farmers have been trained on pest management and diseases control have been provided with knowledge and practical skills on pest infestations and control.

❖ **Establishment and demonstration/dissemination plots and blocks.**

After conduction of training on intercropping farming method, 15 local farmers (12 from Deusa and 3 from Waku) have been selected and technically supported in intercropping model farming to demonstrate at local level. Seed of Cash crops and tree crops was provided by the project, where as selected farmers managed local resources for model demo plot preparation. Demo intercropping plots have been established for replication in wider range in local level.

❖ **Cultivation of marginal land for fodder and forage cropping.**

Varieties of forage and fodders seeds have been provided to DAFRC for wide production of fodder and forage seedlings at local level. In coordination with Buddha Nursery (Sanga, Kavre), 500 kg seeds of different varieties of forage have been purchased and transported to Deusa under management of DAFRC. The seedlings of fodders and forage will be distributed in Deusa and Waku for cultivation in marginal land.

❖ **Purchase of necessary processing equipment for the new cooperative for the most popular products.**

6 coffee bean pulping machines have been purchased in Kathmandu and made available at local level for proper coffee processing. Those machines are mobilized and used under control of DAFRC. More than 1,000 kgs coffee of this year production was pulped through pulping machines. The quality of the bean was far better than the manual pulping. Farmers are motivated and committed for better quality.

❖ **Establishment of contacts with major cooperatives and local and export buyers in Kathmandu.**

The market contacts of local farmers under management of DAFRC for coffee and cash products sale in Kathmandu has been established. The contacts of local farmers in Kathmandu have been established in coordination with Helvetas Nepal. From last harvesting, local farmers have initiated their contacts and have sold about 441 kg coffees in Kathmandu. The market linkage has been established.

## **E. Significant Changes:**

**Timeframe Deviation:** As per the project document and plan, the project activities were framed to complete within 31<sup>st</sup> July, 2017. But, following 3 major activities are remained unaccomplished:

- ❖ Training on farmyard manure and compost manure and its use
- ❖ Exposure visits for local farmers to promote farmer-to farmer know how transfer
- ❖ Establishment of a cooperative and institutionalization for products marketing

**Target Seedlings Plantation Deviation:** In the project document, it was planned to plant about 30,000 tree crop seedlings. But only 21400 seedlings have been planted. It was deviated because the scarcity of nuts' (Pica nuts, grafted macadamia and wall nuts) seedlings and not enough fund to buy seedlings since the price of seedlings was increased. Similarly, the destruction of seedlings in DAFRC nursery by hailstorm limited the number of seedlings production. The nuts seedlings will be purchased and transported to the project site for plantation next season.

## **F. Monitoring and Evaluation of the project:**

The project management has conducted several visit and observation of nurseries available in Kathmandu, Kavreplanchowk and Lalitpur. Project implementation guidelines and orientation on conduction of activities (especially trainings and orientation in field) was

delivered to the responsible staff by the project manager. The monitoring format and guidelines were prepared and are in practice. The progress using prescribed format and feed backs on the implementation were given to concern areas for effectiveness and tracking activities.

TGT Co-Director Dr. Morgan Philips along with local team members have done monitoring visit in Deusa and Waku in first week of February, 2017. The project management monitored ongoing activities and provided valuable feedbacks on the project implementation. The feedback from Dr. Morgan has been considered an assets and implemented in the concern areas.

#### **G. Difficulties**

- Local people were disturbed by the local election during peak hours of project implementation.
- Due to lofty engage of local communities in farming (before election), the training conduction became difficult.
- Due to unavailability of nuts seedlings in nurseries, it was hard to find the seedlings and targeted seedlings were not transported to the project area.
- Due to early summer began; transportation of seedlings became challenging and expensive.

#### **H. Lessons Learnt**

- The AFRC concept itself is "The farmer field school" (FFS) that is became effective in the context to aware rural small farmers in organic pest, manure and soil management. FFSs brought together concepts and methods from agro-ecology, practical education and community development, as a group-based learning process. Overall, FFSs look to reinforce the understanding of farmers about the ecological processes that affect the production of their crops, through conducting field learning exercises such as field observations. The knowledge gained from these activities enables farmers of Deusa and Waku to make their own locally-specific decisions about tree crop management practices.
- There is need of sufficient time for fully materialization of farmer field school approach. The one year period for tree cropping is too short, where project aimed to minimize the effects of climate change on agriculture, especially on tree cropping.
- Involvement of lead farmers as resource person enhances quick update of improved technologies among rural farmers
- There should be thorough networking and collaboration among key stakeholders at central, district and local level.