



EcoHimal Nepal

Climate Change Adaptation in Solukhumbu Integrated Sustainable Tree Cropping and AFRC Programme Annual Report

16th July, 2019 to 15th July, 2020

Supported by The Glacier Trust (TGT), UK

Project Area:

Thulung Dhuhakoshi Rural Municipality and Waku village of Mapya Dhudhakoshi Rural Municipality of Solukhumbu District in Eastern Nepal.

A. Objectives Achieved

Overall Goal

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

Crop diversification and an increase in tree cropping is positively transforming local communities and increasing productivity and income, and subsistence farming is slowly moving in the direction of a significantly more diverse, higher value and lower labour-intensive cropping system. With tree crops fruiting within less than 3 years of planting, farmers have been further motivated toward tree crop production on their farm land, and now more strongly consider tree cropping for creation of self-employment and income generation.

Success in marketing of coffee and the instant cash farmers receive in hand through their own local organization, the DAFRC, and the cooperative are additional motivating factors. The incorporation of the project modality and approach by the local government for continued agriculture development is seen as the way forward to improve and safeguard sustainable local livelihoods through the promotion of tree cropping.

Specific Objectives:

To raise families out of poverty through the promotion of sustainable production and marketing of the produce.

The increasing trend of farmers adopting tree cropping on their land, and increased coverage of tree crops on bare uncultivated land assures an improved environment and employment scenario, and increases income opportunities at the local level. The local small land holders have adopted crop diversification in conjunction with more environment friendly farming practices. As a result, the local farmers are in better position for long-term income generation from the same area of farm land. Farming systems are improved and are now focused on higher value and longer-term and more sustainable benefits.

The local farmers have been empowered with technical knowledge and skills on innovative farming techniques with a wider choice of crops and improved opportunities. Tree crop coverage has increased which has secured an improved livelihood position for local farmers in terms of adaptation to climate change, and income generation.

To capacitate farmers on tree cropping technology and its extension and promotion.

The best practice observed in the project to date is that trained local farmers are practicing improved tree cropping technologies in their farmland and also on marginal previously uncultivated land. Through intensive training including via the farmer field school approach, technical knowledge and skills on climate smart agriculture techniques, especially bio-intensive, layer and multi-cropping, have been transferred and are now applied on the farmlands. Through further capacity building at the established satellite nurseries, the transfer of tree cropping techniques has been transferred, and adoption of the acquired skills is now observed being passed from farmer to farmer and community to community – indicating encouraging local extension and promotion of tree cropping technology. Almost all trained farmers are applying the knowledge and skills gained, and are slowly improving and transforming the farming system from the traditional subsistence to a longer term model with a commercial vision. Three years is too early to judge the full impact of these tree crop interventions, but the positive trends and high motivation of farmers is evidently visible, and encouraging.

B. Outcomes and Results Achieved

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

The local farmers have been provided practical training on new plantation techniques and knowledge of multi-layer intercropping and on-farm tree diversification for the livelihood improvement. Nuts and high value fruit plants have been provided for establishment of initial plantations in their farm land. In total, 224 farmers (43% female and 57% male) have been trained in different subjects; 67 participants attended more than one training and 157 participants attended one training. The major subjects of the trainings were nursery management, bio-intensive plantation techniques, organic farming, organic coffee production and processing, vegetable farming, and vermicompost preparation. As well as the training, the local farmers were additionally supported with distribution of nuts and high value fruit seeds and seedlings. A summary of the trainings is provided in the Table 1, and frequency of training is described in Table 2. Further details of the trainings are provided in [Annex 1](#) and [Annex 2](#).

Table 1: Summary of trained farmers on tree cropping

#	Training on	Participation of Local Farmers		
		Female	Male	Total
1	Nursery management	34	21	55
2	Bio-intensive plantation	11	40	51
3	Banana cultivation	7	11	18
4	Orange cultivation	6	15	21
5	Kiwi orchard management/trellising	7	12	19
6	Coffee production and processing	10	8	18
7	Vegetable cultivation	15	6	21
8	Vermicompost preparation	7	14	21
Total		97	127	224
%		43.30	56.70	100%

Table 2: Frequency of participants in different trainings

#	Particulars	Number of trainees	Number of trainees on the basis of attendance (Table 1)	Remarks
1	Participants attended one training	157	157	157+67=224
2	Participants attended 2 trainings	26	52	26p*2t =52
3	Participants attended 3 trainings	5	15	5p*3t =15
Total		188	224	67

2. With reference to additional 40,000 tree crop seedlings planted

Plantation of seedlings of fruits, nuts, coffee, fodders, forage, vegetable and multi-purpose plants have been widely carried out to increase vegetative coverage, and improve income generation and climatic resilience. All trained local farmers are practicing the intercropping of fruits, nuts and other trees with coffee.

In this reporting period, a total of 28,569 seedlings have been planted by local farmers – a summary is provided in Table 3.

Table 3: Summary of seedlings planted in project area

#	Description of Seedlings Distributed	Quantity	Remarks
1	High value tree crops planted by local farmers and the DAFRC (in support for farmers) - winter and summer plantation	541	Annex 3
2	From self-production at the DAFRC tree crop plantation	1,294	Annex 4
3	Seedlings distributed directly from DAFRC to local farmers	13,113	Annex 5
4	Seedlings purchased by the Ward #8 office (local government) and distributed to local farmers	9,971	Annex 6
5	Seedlings produced and distributed from 4 satellite nurseries	3,650	Annex 7
Total seedlings planted		28,569.00	

3. At least 6 satellite nurseries are established and well managed

In cooperation with local government, 6 satellite nurseries in Wards¹ 2, 3, 5, 7, 6 and 9 of Thulung Dudhkoshi Rural Municipality have been established, and a further one at Ward 4, Nele, which was requested by the local community, is in the process of establishment. Out of 6 satellite nurseries, 4 are functioning well and have started generating an income by producing and selling seedlings of different varieties.

A summary of income generated by the 4 nurseries is provided in Table 4; details of sales are provided in the activities section, Section C below.

¹ There are 9 wards in TDRM



Table 4: Income generated by the satellite nurseries

#	Satellite nurseries	Amount in NPR
1	Lokhim Satellite Nursery (LSN), Ward no. 9	53,000.00
2	Panchan Satellite Nursery (PSN), Ward no. 3	23,650.00
3	Mugli Satellite Nursery (MSN), Ward no. 6	12,500.00
4	Kangel Satellite Nursery (KSN), Ward no. 2	14,000.00
Total income generated		103,150.00

The Satellite nurseries of Jubu Ward no. 5 and Deusa Ward no. 7 require further efforts to make them functional and efficient. The details are provided in the activity section below. All the nurseries are equipped with basic physically infrastructure – for example, land for nurseries, green houses for seedling production, a plastic pond for irrigation - and the majority of the nurseries management committees are active and working well.

4. DAFRC is self-sustained for further agro-forestry initiatives

Institutional sustainability:

DAFRC has sufficient land, and is well equipped the necessary infrastructure, furniture and other materials for accommodation, kitchen, and training logistics and materials - solar power, a hot water system, a projector, sufficient furniture and other basic requirements are all now available at the DAFRC.

The essential administrative and managerial essentials and requirements for institutional sustainability have also been established - as described below.

- The DAFRC carried out timely annual auditing and submitted the audit reports to the concerned line agencies according to the Government's requirements; the audit report for fiscal year 2076/077 (2019/20 AD) is provided in [Annex 8](#).
- The DAFRC's registration certificate has been renewed for the new fiscal year (2077/078; 2020/21 AD) – see [Annex 9](#).
- The Board of Directors is fully functional, and held 8 periodic meetings during the fiscal year – details of the Board of Directors is provided in [Annex 10](#). Open discussions throughout the year focused on institutional development, overall community development, and associated programme interventions; of the many decisions taken during the year, some 92% have been executed. Details of the periodic meetings, the agendas, and the decisions made and executed are described in [Annex 11](#). The institutional capacity of the organization and its autonomous administration and management is considered currently to be very healthy.
- The DAFRC has properly managed the fixed assets to ensure institutional sustainability, and . the assets and their condition are properly accounted for.
- The DAFRC has drafted organizational policies for personnel, and also for financial management. Both policy drafts have been shared with legal experts for final editing.
- The DAFRC has requested the project management and TGT for the design and development of a DAFRC website. Dr Morgan Phillips, Co-Director of TGT, has started the development process by requesting a respected TGT volunteer to assist.
- DAFRC has begun operating its social media platforms (eg.Facebook) and utilizes internet facilities for dissemination and sharing of progress, training news and initiatives.



- Staff members and board of directors are sufficiently and increasingly capable for the overall administration and management of the organization.
- Excellent linkages have been developed with the local government, stakeholders and other line agencies at the district and sub-district levels.

Financial Sustainability:

A 3 year business plan was developed by the DAFRC, and shared with EcoHimal and TGT as a vision and monitoring measure. In this one year reporting period, the financial targets are positive despite the COVID-19 pandemic, the subsequent lockdowns, and the ensuing disturbance in maintain performance and achieving targets. In comparison with the Year 1 targets in the business plan (fiscal year 2076/077 ; 2019/20), the income side is stronger than expenditure. The available records for the income generated by DAFRC from various sources (seedlings, seeds, agro-products, coffee, training, hospitality etc.,) and the incurred expenses to generate income have been examined, and a summary is provided in Table 5, below.

Table 5: Income and Expenditure of DAFRC in fiscal year 2076/077 (2019/20)

#	Particulars	Amount in NPR	Remarks
A	Income		
1	Sale of seedlings/saplings	306,769.79	
2	Sale of varieties of seed (vegetables)	12,250.00	
3	Agro products, collection and sale (coffee parchment and vegetable products)	1,085,807.50	
4	Trainings and demonstrations	32,270.00	
5	Guest hospitality	182,490.00	
6	Financial support from local government	530,000.00	
7	Financial support from Prime Minister Agriculture Modernization Programme	493,684.00	
8	Others	2,320.00	
	Total Income	2,645,591.29	
B	Actual expenditure		
1	Production of seedlings/saplings	495,046.00	
2	Agro product - collection (coffee parchment and vegetable products)	770,510.00	
3	Training and demonstration management	38,430.00	
4	Guest hospitality	145,705.00	
5	Office running cost	30,400.00	
6	Capital investment (building construction and others)	620,892.00	
7	Human resource management	416,000.00	
8	Others	1,632.00	
	Total Expenditure	2,518,615.00	
	Surplus Amount	126,976.29	

A detailed analysis of the business plan is provided in [Annex 12](#).



C. Activities Carried Out and Brief Accomplishments

- **Physical upgrading of the DAFRC**

- ✓ kitchen utensils have been added to improve service for guests – eg. school students from Hong Kong;
- ✓ the dining hall has been upgraded with new glass wall, door and windows;
- ✓ the electricity circuit has been maintained and new wiring added;
- ✓ self-cooking facilities also upgraded for interested guests.

The upgrading of the DAFRC physical infrastructure and other facilities relating to service provision was done in coordination with the Project Management. The Project Manager frequently coordinated with the management committee and staff members of DAFRC. In addition, project management carried out a cross verification visit to the DAFRC before the arrival of the Hong Kong students to check all the facilities and planned services. In preparation for this big team of visitors, the following improvements were carried out:

- ✓ construction of a new dining room;
- ✓ improvement to electrical provision through installation of power socket and switch in all rooms;
- ✓ a 1 KVA generator was installed for alternative lighting;
- ✓ 7 new beds were constructed and placed in different rooms;
- ✓ 2 new tables (kitchen and dining) were constructed;
- ✓ the staircase of the main building was significantly improved;
- ✓ a hand washing basin was placed outside the toilet;
- ✓ mud plaster was applied in the upper floor of the main building;
- ✓ a new water tap was positioned in front of the dining room;
- ✓ serving discs were purchased for serving food through a buffet service.

The DAFRC kitchen building has been upgraded through the addition of 4 more rooms with the financial support of the Thulung Dudkoshi Rural Municipality. Even though this improvement has yet to be completed at the time of writing, the building is in use. The High-Tec nursery has been improved through the creation of 3 new plots bounded by 350 roofing stones; this nursery is used for seedling production of different varieties of vegetables and fruits. Three plastic ponds in the DAFRC premises have been renovated and filled through rain water harvesting. The tagging of plants with both common and scientific names, has been completed for 31 species to help visitors identify plants more easily.

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

The Project Management has conducted several visits to various agro-based enterprises, nurseries and suppliers to ensure that local farmers receive a fair and reasonable price for their products. Coordination, correspondence and meetings in Kathmandu to enhance market access of products - especially coffee, goose berry, ginger and turmeric - were also carried out by Project Management. As a result, a new connection with Nepal Organic Coffee Pvt. Ltd has been established, while coordination with Nuwa Estate Coffee Pvt. Ltd continues for the roasting and marketing of coffee.



Samples of ginger, turmeric and coffee were sent to Germany for quality assessment, and positive responses were received about all products, and potential for future marketing.

The last 3 harvests of coffee were supplied to Nuwa Estate Coffee Pvt. Ltd, as parchment coffee. This year, however, the company delayed the payment to the farmers, and both DAFRC and Eco-Himal were under pressure from farmers for many months, as farmers are naturally unhappy not to receive sales revenue for almost a year. The money for the 2019 harvest was only received from Nuwa Coffee in July 2020, and was immediately transferred to the farmers.

As this is much too late, new more responsible buyers have been sort in Kathmandu for the Solukhumbu coffee. In the course of search by Project Management, Nepal Organic Coffee Pvt. Ltd, Everest Coffee and Beautiful Coffee Nepal were consulted. The Project Management, together with TGT Co-Director Mr. Richard Allen, visited the Nepal Organic Coffee Pvt. (NOC) Ltd outlet shop and its processing unit; discussions held with the company were positive, and a trial run was planned.

338 kg of parchment coffee, harvested in 2020, has already been supplied to NOC. A further 500 kg (approx..) of coffee has already been collected at the DAFRC, and local farmers continue to deliver their coffee at the time of writing – this coffee will be delivered to Kathmandu very soon after the lifting of travel restrictions due to the COVID-19 lockdown. A record of coffee production is provided in [Annex 12](#), sheet no 11.

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

Purchased:

Procurement and distribution of seedlings continued during two seasons of the year, summer and winter, to promote sustainable tree cropping. The project coordinated with various nurseries in Kathmandu, Kavre and Lalitpur, purchased the required seedlings, organized transportation and distributed the seedlings in cooperation with the DAFRC. The local farmers were instructed to intercrop these seedlings, especially with coffee.

In the winter season, 277 seedlings were distributed to 49 local farmers of Deusa and Waku – please refer to [Annex 3](#), sheet 1). In the summer season, 189 seedlings were distributed to 20 local farmers of Deusa – please refer to [Annex 3](#), sheet 2 - and 75 seedlings were planted at the DAFRC – [Annex 3](#), sheet 3). In total, 541 high value tree crop seedlings were planted in the reporting period.

Production:

Diverse varieties of seedlings were produced at the DAFRC nursery, and distributed to local farmers. As in past years, DAFRC produced and distributed a large variety of seedlings - vegetables, fruits, nuts, fodder, forage and other plant species. This year, DAFRC produced 55,801 seedlings of different varieties; 14,407 seedlings have been sold to local farmers, and the remaining 41,394 plants are in stock – see [Annex 13](#) for a record of seedlings in stock. The sale of plants is not seen as satisfactory as it was significantly affected by the COVID-19 pandemic and the continuing movement restrictions. A summary of plants sold and income generated is provided in Table 6.

Table 6: Summary of plant sales

#	Type of Seedlings	Quantity	Amount in NPR
1	High value tree crops	1,294	50,675.00
2	Fruits and vegetables	3,635	89,170.00
3	Non timber	15	2,250.00
4	Cash crops	3,169	43,855.00
5	Forest tree	105	3,025.00
6	Fodders and forage	6,189	71,195.00
Total		14,407	260,170.00

- **Winter season 2020/21 plant reserve:**

Different fruits and nuts have been ordered and reserved for winter plantation in 2020/21. Local farmers are requested to prepare plantation pits. The local demand of plants was collected by DAFRC on the basis of demand, and the necessary seedlings have been reserved. 189 seedlings of apple, cheery, peach, almond and apricot have been prepared in coordination with Everything Organic Nursery, Kavrepalanchok - details of these plants are provided in [Annex 14](#).

- **Training of at least 120 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.**

Capacity building of local farmers through various trainings, which included considerations of climate change adaptation, have been continued in the reporting year. Due to COVID-19, it was not possible to provide all the planned trainings, but despite the challenges and constraints, the following trainings have been carried out in the year.

- **Training on nursery management**

Local farmers of Waku were trained by technical staff in fruit nursery establishment, bio-intensive plantation techniques, weeding and orchard management. 55 farmers received technical and practical knowledge through field-based demonstration and coaching. In addition, they were also trained in vegetable farming and mushroom production – please refer to [Annex 1](#), sheet 1 for details.

- **Training on bio-intensive plantation**

103 local farmers were trained in bio-intensive plantation techniques – 52 farmers of which were from Waku village and trained under the leadership of the Ward no. 6 Chairperson during the winter plantation season. 51 local farmers were trained in bio-intensive plantation techniques in the summer – this included pit preparation, resource management and plantation skills - please refer to [Annex 1](#), sheet 2 for details. Technical knowledge was provided, and practical skills were imparted through field-based demonstration. The local farmers obtained knowledge on:

- plantation bed preparation,
- pits preparation,
- local materials and manure preparation,
- filling of pits with organic matter, soil, compost and manures,
- seedling plantation and care.



➤ **Training on orange cultivation**

21 farmers were trained on orange cultivation technologies, with a focus on orchard management, manuring, grafting, boardo mixture preparation and its application, and intercropping – please refer to [Annex 1](#), sheet 4 for further details. The training was facilitated by the Orange Zone Office (part of a government initiative with a headquarters in the Solukhumbu district centre of Salieri), in coordination with the DAFRC.

➤ **Training on kiwi orchard management (focusing on trellising)**

Local farmers of Deusa village received technical knowledge on kiwi cultivation and orchard management techniques including planting preparation, planting, watering, weeding and pruning and trellising. A practical demonstration on trellising with cement pillars/posts was provided. In total, 19 local farmers were benefited – please refer to [Annex 1](#), sheet 5 for details.

➤ **Training on coffee production and processing**

This training was refreshment training for the local farmers who were enabled with more technical knowledge on coffee cultivation, including the importance of shading and intercropping. 18 local farmers participated in the training – please refer to [Annex 1](#), sheet 6.

➤ **Training on vegetable farming**

21 local farmers received technical knowledge on organic vegetable farming methods – please refer to [Annex 1](#), sheet 7). The farmers received technical knowledge and skills on: organic vegetable farming, basic concepts of vegetable cultivation, nursery establishment, kitchen gardening, and the proper handling of farm waste and household waste.

➤ **Training on banana cultivation**

Local farmers were enabled with technical knowledge on banana farming and its use as a shading plant for coffee. Farmers received knowledge on the different types and varieties of banana, soil management, the procedure for proper compost manure preparation, manuring, fruiting and harvesting. A total of 18 farmers benefited – please refer to [Annex 1](#), sheet 3)

➤ **Training on compost/vermicompost production**

Farmers of Deusa have learned to prepare compost fertilizer from decomposable waste. This training was organized to provide technical knowledge and skills required for producing and managing vermicompost from green waste. The training was organized by Orange Zone Office in coordination with the DAFRC. A total 21 farmers benefited from the training – please refer to [Annex 1](#), sheet 8.

• **Field extension and supervision of orchard and plantation development**

In the reporting period, 2 applications of manure were provided to the hazelnut orchard, along with regular weeding and irrigation. The growth and survival status of planted hazelnut seedlings was evaluated in the middle of the year – of the 430 plants, 349 were active, 42 were dormant, 9 were inactive, and 30 plants had died.

Among the 5 varieties of the hazelnuts, the tallest variety is Yellow (A) with an average height 48.8”, and the shortest variety is Cochlet (P1) with an average height 29.5”.

- **Establishment of satellite nurseries for tree crop seedling production**

The satellite nurseries are managed by individual lead farmers who maintain their nurseries and produce seedlings of fruits and fodders for sale – they are generating income from the seedling production. Agri-materials, seeds and technical support have been regularly provided by the project.

A description of progress at each of the six nurseries is recorded below.

Satellite Nurseries	Progress																																										
Lokhim Satellite Nursery (LSN), Ward no. 9	<p>A. Income</p> <ul style="list-style-type: none"> • Income from the sale of 350 kg tomato = NPR 13,000.00 (from 184 plants inside the greenhouse). • Income from the sale of 800 seedlings of coffee = NPR 12,000.00 • Income of sale of 2,000 wild cherry seedlings = NPR 3,000.00 • Income from sale of seeds <table border="1"> <thead> <tr> <th>#</th> <th>Seeds of:</th> <th>Unit</th> <th>Quantity</th> <th>Rate</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Cauliflower</td> <td>Packets</td> <td>2</td> <td>1500</td> <td>3,000.00</td> </tr> <tr> <td>2</td> <td>Chilly</td> <td>Packets</td> <td>5</td> <td>1000</td> <td>5,000.00</td> </tr> <tr> <td>3</td> <td>Tomato</td> <td>Packets</td> <td>5</td> <td>1300</td> <td>6,500.00</td> </tr> <tr> <td>4</td> <td>Nevaro</td> <td>Packets</td> <td>7</td> <td>700</td> <td>4,900.00</td> </tr> <tr> <td>5</td> <td>Mulberry</td> <td>Packets</td> <td>8</td> <td>700</td> <td>5,600.00</td> </tr> <tr> <td colspan="5" style="text-align: right;">Total</td> <td>25,000.00</td> </tr> </tbody> </table> <p>Total nursery income = NPR 53,000.00</p> <p>B. Seedling production:</p> <ul style="list-style-type: none"> • 980 seedlings of vegetables, fodders (ipil ipil, Mandola) and coffee are in stock in the nursery and ready for sale. • 900 seedlings of wild cherry are in stock and ready for sale <p>C. Mother plants of apple, nectarine, peach, lemon and orange are growing well. These mother plants are grown for propagation through its scions.</p> <p>D. Infrastructure/facilities installed:</p> <ul style="list-style-type: none"> • Constructed store house in the nursery caretaker 's property, • Constructed plastic tunnel (greenhouse), • Installed a plastic pond. <p>Due to the influence of this nursery, 3 local farmers are frequently requesting for support (especially for seedlings and seeds) to establish satellite nurseries, totalling about 50 ropani² of land.</p>	#	Seeds of:	Unit	Quantity	Rate	Total	1	Cauliflower	Packets	2	1500	3,000.00	2	Chilly	Packets	5	1000	5,000.00	3	Tomato	Packets	5	1300	6,500.00	4	Nevaro	Packets	7	700	4,900.00	5	Mulberry	Packets	8	700	5,600.00	Total					25,000.00
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Panchan Satellite Nursery (PSN), Ward no. 3	<p>A. Income</p> <ul style="list-style-type: none"> • income of NPR 6,000.00 through sale of 400 banana seedlings; • income of NPR 15,000.00 through sale of 1000 coffee seedlings; • income of NPR 1,500.00 through sale of 100 seedlings of ipil ipil, and NPR 750.00 through distribution of 50 seedlings of soap 																																										

² One ropani is 508 square meters.



	<p>nuts (Ritha);</p> <ul style="list-style-type: none"> • income of NPR 400.00 rupees through sale of 200 cauliflower and cabbage seedlings. <p>Total nursery income: NPR 23,650.00</p> <p>B. Seedling production: In stock and ready for sale:-</p> <ul style="list-style-type: none"> • 800 seedlings of banana, • 1000 seedlings of coffee, • 100 seedlings of ipil ipil, • 450 seedlings of soap nuts, • 4,800 cauliflower and cabbage seedlings, • mother plants of lemongrass x 2, apple x 2, grape x 1 and almond x 2 are growing in the nursery, • mother plants of apple, nectarine, peach, lemon and orange growing for scions. <p>C. Infrastructures/facilities installed:</p> <ul style="list-style-type: none"> • One greenhouse installed
<p>Mugli Satellite Nursery (MSN), Ward no. 6</p>	<p>A. Income</p> <ul style="list-style-type: none"> • income of NPR 7,500.00 through sale of 500 fodder seedlings (Rai Khaniu, local fodder of fig family); • income of NPR 4,000.00 through sale of 2,000 vegetable seedlings. <p>Total income by nursery: NPR 12,500.00</p> <p>B. Seedling production: In stock and ready for sale:</p> <ul style="list-style-type: none"> • 150 seedlings of mulberry, • 200 seedlings of Nevaro (a fodder species), • 100 seedlings of soap nuts, • 500 seedlings of Mendola (a fodder species) are growing • 1000 seedlings of Rai Khaniyou (fodder), of which 500 plants are ready for sale. <p>C. Infrastructure/facilities installed</p> <ul style="list-style-type: none"> • a greenhouse, • a plastic pond for storage of harvested rain water.
<p>Kangel Satellite Nursery (KSN), Ward no. 2</p>	<p>A. Income</p> <ul style="list-style-type: none"> • income of NPR 3,000.00 through sale of 200 banana seedlings; • income of NPR 3,000.00 through sale of 200 Nevaro seedlings; • income of NPR 3,000.00 through sale of 200 mulberry seedlings; • income of NPR 5,000.00 through sale of 500 vegetable seedlings. <p>Total nursery income: NPR 14,000.00</p> <p>B. Seedling production: In stock and ready for sale and distribution:</p> <ul style="list-style-type: none"> • 300 seedlings of banana, • 300 seedlings of mulberry, • 2,100 seedlings of Mendola (fodder),



	<ul style="list-style-type: none"> • 600 seedlings of wild cherry, • 100 seedlings of Napier, • 5 mother plants of Lemongrass are in nursery • 400 seedlings of Nevaro (fodders) are growing in the nursery. <p>C. Infrastructures/facilities installed:</p> <ul style="list-style-type: none"> • a greenhouse, • a plastic pond for storage of harvested rain water.
<p>Jubu Satellite Nursery (JSN), Ward no. 5</p>	<p>A. Income</p> <ul style="list-style-type: none"> • No income in the reporting period. <p>B. Seedling production:</p> <ul style="list-style-type: none"> • 500 seedlings of coffee and 2,000 seedlings of fodder species were ready for sale but due to negligence of nursery management committee, all seedlings died. <p>C. Infrastructures/facilities installed</p> <ul style="list-style-type: none"> • A greenhouse - but is empty • A semi-permanent house <p>The situation of the nursery is pathetic. There is need for wholesale reform of the committee, and a re-start with new energy, supervision and hope.</p>
<p>Deusa Satellite Nursery (DSN), Ward no. 7</p>	<p>A. Income</p> <ul style="list-style-type: none"> • No income during the reporting period. <p>B. Seedlings production:</p> <p>This nursery was started late due to land acquisition problem. No significant work on production of seedlings has been done in the satellite nursery, and the greenhouse is currently empty.</p> <p>C. Infrastructures/facilities installed</p> <p>A greenhouse is installed and nursery beds are ready.</p> <p>A new strategy is being prepared, and the nursery committee needs fresh mobilization and impetus. The Ward Chairperson is positive and promises improvement.</p>
<p>Newly proposed Nursery at Nele ward no. 4</p>	<p>The local community of Nele organized a meeting, decided to submit a proposal to request EcoHimal to support the establishment of a new satellite nursery support. The project management will coordinate with DAFRC and take a decision on this proposal on the basis of local ownership and sustainability.</p>

All 6 satellite nurseries and the DAFRC have been supported with the necessary agri-materials, tools and vegetable seeds, and project management has ensured regular coordination with the nursery management committees, and follow up technical support progress evaluation. Due to the COVID-19 pandemic, however, there has been a long gap in terms of physical monitoring by the project management.



- **Cultivation of marginal land for fodder and forage cropping**

Different varieties of forage and fodders seeds have been distributed to local farmers for cultivation on marginal land. During the reporting period, 9,478 seedlings from the DAFRC were distributed to local farmers for cultivation in marginal land – details are recorded in [Annex 5](#), sheet 2 & 3.

This marginal land plantation programme was undertaken in coordination with the office of Ward no. 8, TDRM. The 7 local agriculture groups and DAFRC were mobilized for the plantation mission; in addition, 8 farmers were supported with different varieties of seedlings for their own use. In total, 9,971 seedlings of fodder, forage and cash crops were planted – details are provided in [Annex 15](#).

- **Establishment of cooperative to oversee the development of enhanced tree crop production and product marketing**

The cooperative "*Sustainable Organic Coffee, Orange, and Fruits Cooperative Limited*" is currently in the process of institutionalization. Regular meetings of the cooperative are organized to discuss a wide range of subject matter, including seedling production, resource pooling, and market linkage creation.

To date, 48 local farmers (25 females and 23 males) have been enrolled as members – see [Annex 16](#) for the list of members. The Cooperative is managing a sum of NPR 2, 58,800.00 to from the following sources:

– Membership fees	NPR 14,400
– Members share investment	NPR 123,400
– From the Prime Minister Agriculture Modernization Program	NPR 59,000.00
– From EcoHimal Nepal as seed money for a revolving fund	NPR 60,000.00

The following expenses occurred for agriculture activities during the fiscal year:

- NPR 97,800/- for agro-materials, purchased and distributed to cooperative members,
- NPR 38,000/- for irrigation pipe, purchased and distributed for use in coffee orchards by cooperative members.

The balance of funds remaining with the Cooperative at the end of July 2020 totalled NPR 123,000/-.

The further institutionalization of the Cooperative will ensure improvements in the following - market linkages, access to financial capital, organic certification, and product quality.

The project staff members along with the DAFRC management committee and the cooperative committee were trained on proper book keeping and financial management by the project manager. In addition, a short orientation on cooperative management was provided, covering principles of cooperatives, proper accounting, and transparent management, and financial plan formulation. A week long cooperative and financial management training was planned together with Ward Office but it was not possible to hold it due to the nationwide lockdown.



- **Challenges of coffee marketing and its way out:**

The TGT and EcoHimal project management is discussing on a new idea of hub and spoke coffee production and roasting model to promote cooperative oriented production, processing and marketing of coffee. A draft discussion document is provided in Annex 16.

The TDRM Mayor, Mr. Ashim Rai, has fully supported the concept and is willing to work together on this, and jointly invest in the report. He is planning to discourage the import of coffee from outside, and promote local organic coffee in the municipality, and fully supports the establishment of a local processing and outlet centre, if the Project could provide 30% of the funds and take management responsibility.

- **Establishment of demonstration plots and blocks**

For demonstration of tree crop cultivation methods, and subsequent dissemination of seedlings, a model tree cropping village has been established every year. In this summer season, a model village of tree cropping has been established in the Jhorani hamlet of Deusa village, Ward no 8 of TDRM. Following the demonstration, a total of 20 farmers have planted 189 seedlings of 7 varieties of tree crops, as shown in Table 8 below. The tree crops seedlings have been intercropped with millet and chilly.

Table 8: Tree crop plantation in Model Tree Crops village

#	Farmer's Name	Cherry	Orange	Peach	Gooseberry	Apple	Almond	Apricot	Total Seedlings
1	Asharman Rai	1	2	2	1	2	1	1	10
2	Sabita Khatri	1	2	2	1	2	1	1	10
3	Chyambe Tamang	1	2	2	1	2	1	1	10
4	Chandra Tamang	1	1	2	1	2	1	1	9
5	Nir Kumar Tamang	1	2	2	1	2	1	1	10
6	Dalab Tamang	1	2	2	1	2	1	1	10
7	Akalab Tamang	2	2	2	1	1	1	1	10
8	Santob Tamang	1	2	2	1	2	1	1	10
9	Jali Maya Tamang	1		1	1				3
10	Dhan Kumar Tamang	1	2	2	1	2	1	1	10
11	Lila Man Tamang	2	2	2	1	1	1	1	10
12	Buddha Tamang	1	2	2	1	2	1	1	10
13	Jhamak Singh Rai	1	2	2	1	3	1	1	11
14	Ambar Rai		3	1		1	2	1	8
15	Lal Man Tamang	1	2	2	1	2	1	1	10
16	Devaki Rai	1	2	2	1	2	1	1	10
17	Krishna Tamang	1	2	2	1	2	1	1	10
18	Parbati Rai	1	2	2	1	2	2	1	11
19	Purna Tamang	1	2	2		2	1	1	9
20	Mani Tamang	1	2	2	1		1	1	8
Total Seedlings planted		21	38	38	18	34	21	19	189



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

The RM level cooperative is registered and functional, especially for marketing of coffee, orange and other fruits. The cooperative will help farmers in establishing improved market linkages, access to financial capital, certification and quality improvement. The TDRM is planning to form a RM level cooperative to facilitate farmers for agri production, processing and marketing.

The coffee market in Kathmandu is manageable and we have now a second buyer; however, selling parchment coffee is not very beneficial for farmers, and a better alternative is needed to improve farmer benefits. The project follows organic production, climate change mitigation and fair trade principles, but it is equally important to guarantee a fair price to the farmers.

- **Organic certification:**

3 years of organic certification procedures have been completed in coordination with the Organic Certification Nepal Pvt. Ltd. 20 coffee farmers are now certified as Organic Coffee Producers and provided a logo; the certificate can be viewed in [Annex 18](#).

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

Regular coordination is carried out with local government officials. In this reporting period, the project manager conducted 3 meetings with Mr. Asim Rai, the Chairperson of the local government, and discussed tree cropping, coffee cultivation, processing and promotion. As reported above, Mr. Rai has requested the project management to develop a financial and technical plan for a coffee processing plant into which the rural municipality could invest. Brief discussions about an extension of the satellite nurseries and more effective intervention strategies were also held, and Mr Rai recommended the mobilization of the Ward committees in this regard. In addition, the project manager conducted a field level meeting with Mr. Rai at the DAFRC and discussed a wide range of topics.

Local farmers are being encouraged to pool their resources, and develop better linkages with local government. DAFRC has been successful in obtaining financial support from the Thulung Dudhkoshi Rural Municipality for infrastructure development and other programmes on an annual basis.

DAFRC has also been working together with the Prime Minister's Agriculture Commercialization Programme (PMACP), and grant support was provided for the installation of trellising for kiwi plants, and various trainings.

In December 2019, a RM level agricultural promotion event was organized by the local government. In the event, the project management in coordination with the DAFRC established a stall to demonstrate organic coffee production and a model kitchen garden. Seedlings, plants and coffee beans were demonstrated along with brief information about tree cropping and bio-intensive techniques of planting for climate resilience. The visitors along with federal parliament member Mr Hem Kumar Rai, province parliament member Mr Uttam Basnet and Mr. Buddhi Kumar Rajbhandari observed the display and tasted the organic coffee. It was a good opportunity to promote locally produced organic coffee. Mr



Uttam Basnet bought a number of plants of herbs and fruits, and soon after he invited our staff Mr. Keshab Rai to his village and organized a one day long orientation to the local farmers on tree cropping and its impacts on climate change and livelihood.

- **Goat farming promotion and support**

To promote collective goat farming in the programme area, 3 goat farms were formed and provided support. All 3 farms - Gramin Bakhrapalan farm (Rural Goat Farm), Namuna Bakhrapalan farm (Model Goat Farm), and Ranem Bakhrapalan farm (Ranem Goat Farm) are functional. Each farm has been supported with technical knowledge, necessary materials and forage/fodder/grass seed and seedlings. Currently, there are 316 goats in the 3 farms.

- **Poultry farming promotion and support**

5 local farmers have been supported with chickens, farm materials and technical support; in total, 1,156 chickens are being reared by the 5 farmers. The DAFRC is regularly monitoring the progress of each farmer and providing technical feedback. The chicken rearing farmers have started generating income from the sale of eggs and chickens.

- **Institutionalization and capacity building of DAFRC**

Project staff members along with management committee members of the DAFRC have been trained on proper book keeping and financial management by the project management. Mr Keshab Kumar Rai, Ms Dhan Kumari Rai and Mr Til Bahadur Rai obtained skills and technical knowledge on book keeping, and are now capable of keeping proper records of income and expenditure. Consequently, they have conducted annual auditing in time and have renewed registration of the organization.

- **Participation in discussion programme on coffee**

The project manager actively participated in two interaction meetings of coffee stakeholders, organized by the National Tea and Coffee Development Board – one in October 2019, the other in March 2020. Both meetings were focused on coffee promotion, policy improvement and institutional development. In the meetings, the following issues were discussed;

- quality production of coffee and its marketing;
- current issues – including diseases and pests such as stem borer, coffee plants fading, and immature fruits falling;
- need of amendments in the current coffee policy and its provisions;
- need for more field research in coffee;
- the importance of organic certification;
- problems on varietal selection, etc.;
- the problem of introducing Robusta varieties of coffee by some unknown farmers.

- **GSIS students visit in Deusa**

The German Swiss International School (GSIS) students educational and cultural exchange programme in Deusa village took place successfully from the 12th to 17th October, 2019. The visit was supervised by Dr Morgan Philips from TGT and Ms. Anisha Kharel from EcoHimal. TGT volunteer Mr. Dinanath Bhandari also accompany the trip and provided valuable support and feedback. The students acquired knowledge of the local farming systems and



climate change initiatives through the local community, and were provided with a hands-on field practice of Nepali bio-intensive techniques for tree plantation. They also had an interaction programme at the Deusa Secondary School which focused on climate change adaptation practices at local level and the local food culture. In addition, they explored the coffee farming production area, and observed local level processing. A report from Anisha Kharel is provided in [Annex 19](#).

It was an excellent opportunity for the local community, students and associated teachers to build cultural linkages, observe and understand project achievements, and experience climate change adaptation and mitigation practices promoted by the TGT-EcoHimal project.

- **Significant changes in the original plan:**

Timeframe deviation: with reference to the project document and plan, most activities have been accomplished – the exceptions, listed below, were not possible due to the pandemic and subsequent 4 month lockdown:

- exposure visits for local farmers to promote farmer-to-farmer knowhow transfer;
- capacity building of 2 youths as lead trainers to provide training in improved tree cropping;
- development of tree crops distribution profile, survival record and performance at year end;
- guest hospitality training to staff members.

D. Monitoring of the Project Implementation

The project management conducted 5 visits to the project area, and the project manager has diligently tracked the progress by phone during the lockdown period, and provided project implementation guidance and orientation to all staff members. Monitoring format and guidelines were developed and provided to staff members to collect data, and ensure effective monitoring of progress. Staff members were also frequently instructed and guided to further improve project implementation, financial management, documentation and monthly reporting.

TGT UK Co-Director Dr. Morgan Philips carried out his yearly monitoring visiting field to Deusa in October 2019, during the GSIS student visit, and provided his valuable feedback for further improvements. In addition, TGT Nepal Co-Director, Mr. Richard Allen, regularly coordinated with project management and carried out follow-up of the project progress, and editing of periodic reports with valuable inputs.

E. Success Indications

- Demonstration and teaching of bio-intensive plantation techniques in rural village, provision of high value tree crops seedlings to local farmers, plantation of seedlings applying bio-intensive plantation techniques, manuring, timely weeding and pruning has resulted in significant success, and the success of trialling in different villages could be seen on the ground. The tree crops (e.g. apple, almond, peach, nectarine) started fruiting – farmers showed great surprise that fruits like apple and almond (*syau* and *deshi badam* in Nepali) could fruit so quickly under trial conditions. The farmers' happiness was beyond imagination, and they were fully convinced that the promotion



of fruit and nut tree cultivation could support small land holding rural farmers and increase their incomes. They expressed that it is the current need of the country to adopt climate change resilient practices, and that sustainable tree cropping could generate self-employment improve local income generation opportunities. The voice of the local farmer as expressed by the Chairperson of DAFRC is recorded in [Annex 20](#).

- The local government is very positive and supportive towards the project concept and design. On the basis of the success of tree cropping and the high demand from local farmers, the local government requested the project management to prepare a short plan of action for tree cropping and climate resilient agriculture as a reference document for their own municipal planning. The local government acknowledged the significance of the project for improving local livelihoods.
- The whole world has been affected by the COVID-19 pandemic, and Nepal was not excluded. The Government of Nepal imposed a nationwide lock down since 24th March 2020, including much restricted travel. However, the project management succeeded in keeping the project alive and making progress as a result of its policy of centres in the project area and hiring of local staff. All programme activities were conducted maintaining social distance and following preventive and protective health measures; it was possible to continue seedling production and care of plants in the centres and nurseries but it was not possible to undertake group trainings and orientations. Despite all the difficulties and restrictions, it was possible to distribute seedlings, seeds and other technical supports to the local farmers in time for the monsoon planting season.
- Crowd funding was initiated by Dr. Morgan to raise funds for preventing local transmission of the COVID-19 virus. The funds were used for buckets, soap, masks, and distributed to the TGT and EcoHimal project areas. This was a great humanity action, showing a commitment to service above self.

F. Difficulties

- Due to COVID-19 and its implications (nationwide lockdown, travel restrictions, restrictions on number of people allowed to gather together), it was not possible to hold trainings, orientations and field visits.
- Regular tracking of progress at the satellite nurseries was less than optimum during this reporting period. Due to the large geographical coverage of Thulung Dudhkoshi Rural Municipality, field visits to all satellite nurseries by limited staff members is a real challenge in this adverse situation and physical monitoring was restricted.
- Due to COVID-19, procurement of seedlings produced at the DAFRC was low, and supply of seedlings to neighbouring districts (eg. Khotang, Okhaldunga) and rural municipalities (eg. Solu Dudkunda, Necha, Salyan, etc.) was hugely disturbed. If this had not been the case, the DAFRC income would have been much higher. One example of losses incurred due to the lockdown is the huge loss due to the death of 15,000 seedlings of cardamom.

G. Lessons Learnt and Learning and Sharing

- **Lessons Learnt**
 - If new technologies with an innovative concept is introduced, after conducting feasible study, and are applied in a correct way, a small initiation can have a big influence. The



application of our Nepali bio-intensive plantation concept for the production of high value fruits and nuts is observed as a success within a short period of time (3 years). The farmers' success in harvesting fruit and nuts opens the door for project replication and expansion. Agriculture, especially tree cropping, is a long process and it is not possible to evaluate immediate results – however, within 3 years of project implementation, the local community is fully convinced that the transformation from traditional farming towards tree cropping is beneficial for their future.

- Field-based practical training is more effective for the farmers to transfer information, skills and knowledge, as most of the farmers are not strong in reading and writing. Practical demonstrations allow farmers to understand the new ideas and technologies more easily, and give them the confidence to put them into practice.
 - Involvement of lead farmers as resource persons for their community was found to be very effective in the transfer of skills and technologies to other farmers - for example, Dinesh Rai, who conducted multiple trainings on bio-intensive plantation techniques in coordination with our technical staff.
 - An appropriate locally adapted concept, a sound project design and effective implementation can influence local policy makers. The local government is very positive and supportive towards this tree cropping programme, and advocates for its extension to the whole rural municipality.
- **Learning, sharing and replication**
 - Farmers from neighbouring villages and districts have been visiting DAFRC and obtaining technical knowledge on agro-forestry practices – lessons, achievements and technologies, as well as seeds and seedlings, have been shared with farmers from the wider community for replication.
 - A team from Germany under the leadership of Mr. Namgel Sherpa, representing Nepalhilfe Bonn³, visited the DAFRC for two days, and after observing the facilities, nurseries, and other other initiatives, thorough discussions on the agro-forest resource centre were held. As a result, they proposed that EcoHimal replicate the Centre and initiatives in Khiraule village; EcoHimal has followed up, and already established two small replicas in Khiraule. The Mahakulung Rural Municipality had already started a similar expansion programme from 2019.
 - EcoHimal Austria has approved an agro-forest resource centre project designed for the Aaiselukharka and Rawabesi Rural Municipality of Khotang district. The concept of agroforestry resource centres, first discussed in 2007 and implemented from 2013 in Deusa, is therefore now being replicated in Kavreplanchowk District, and then now in Khotang District. This represents a significant success story for TGT and EcoHimal Nepal.

H. Next Steps

1. Nurseries: proper institutionalization of the satellite nurseries, and special focus on reinvigorating the passive nurseries so that they become functional.

³ Nepalhilfe Bonn has been providing financial support to EcoHimal Nepal since 2017 to implement Integrated Rural Development Project in Khiraule village of Mahakulung Rural Municipality, ward no 1, Solukhumbu



TGT



2. Although different lockdown scenarios and travel restrictions remain in place in the country, bio-intensive trainings and updates of the survival status of planted seedlings, both at the nurseries and in the farmer's fields is a priority.
3. Trainings on various other improved farming technologies is also a priority when the country opens up to a more normal situation. The regular monthly farmers trainings must also be resumed as soon as possible.
4. Capacity building of farmers in the field of integrated pest management and diseases control also needs to be restarted.
5. Cultivation of marginal land for fodder and forage plantation is also a priority, and remote and field support needs to be provided before the upcoming winter season.
6. Capacity building of local youths as lead trainers is another part of the project that has been delayed due to the lockdown; they urgently need training in improved tree cropping, management practices, plantation establishment, diversification, and intensification.
7. The DAFRC needs to establish a system of providing marketing information for the farmers at the DAFRC.
8. Procurement of necessary processing materials for different crops for the 2021 seasons is also important to complete in the coming months.
9. The cooperative needs to be upgraded in order to oversee the development of enhanced coffee and tree crop production, and also product marketing.