



Funded

HIAL Desert Greening Initiative

Progress Report

July – Sep 2020 (7th Project Quarter) & Sep - Dec 2020 (8th Project Quarter)



HIMALAYAN INSTITUTE OF ALTERNATIVES, LADAKH

An Alternative Institute for Mountain Development

Pioneering



03 February 2020

HIAL Campus, Phyang, Ladakh UT
SECMOL Office, PO Box 4, Leh, Ladakh UT

Progress Summary

In the past two quarters, we outsourced sapling growth to the village youth to be used at HIAL, did soil improvements for new plantation areas and continued the upkeep of the Miyawaki plantation, the high-density apple orchard, the apple-apricot orchard and the cuttings in the greenhouse and nursery. The major activity in the December month has been the re-mulching to maintain a cover over the soil to protect from winter chills.

Maintenance of Apple Orchards in terms of regular watering as well as fertilisation using compost and manure, has occurred. We are hopeful that the Apple Orchard extension would be done this spring, if the roads open in spring, which they are expected to, by the end of February 2021. The saplings could not be sourced from UT Jammu and Kashmir in autumn as the nursery there was closed due to COVID-19 pandemic related lockdowns. In the meantime, we have been adding soil amendments to these new orchard rows to give the new trees the best start possible, as soon as they arrive.

The experimental plantation of bio-fence with saplings sourced from a site that was removing them did not yield much success probably because the method of uprooting the full-grown plants damaged the roots and they couldn't be saved.

The plants that were germinated in the nursery beds continued to show good growth in the Autumn till they went into dormancy in Winter. Similarly, the plants in the *Miyawaki* plantation showed similar growth. It appears that some of the species have dominated the plantation area while others have showed stunted growth in the region. This being a pilot plantation, is being observed very closely to draw learnings from and possibly develop a few changes to make the technique adoptable for Ladakh like cold arid regions.

However, the quarter was also full of challenges and HIAL faced difficulties like loss of trained manpower and COVID related lockdowns. After lockdown in June, HIAL had to close all its works during July – September as there were no labourers nor saplings and then again in October for three weeks and then in November again for three weeks due to two different waves of COVID positive cases. Still we arranged or plantations in Kargill as well as identified suppliers for nurseries around Ladakh in these months. Luckily, none of the staff members faced any serious health issue but it led to loss of the precious autumn working season.

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Project Progress Report

Miyawaki Pilot Plantation

Since the last survival count of the plants, we increased the frequency of the watering of the plants to ensure enough irrigational water availability to the plants. We didn't notice any severe change since the Jun 2020 survival count and hence didn't do the survival count.

Below is the list of the 10 species which were planted in the Miyawaki Pilot Plantation Forest in April 2019. Five out of ten species have suffered moderate to severe losses and range between 3% to 38% survival. Four species have shown no survival whilst one species, *Lepidium latifolium*, has proliferated, nearly doubling itself from the original number planted. The survival count of the plants cannot happen in peak winter as they enter dormancy and any count would not yield correct results. It will be done in summer this year.

Table 1: Miyawaki Pilot Plantation Species-wise Numbers Surviving & Percentage

S. No.	Botanical name	Common name	No.	Survival as on Jun 2020	
				No.	Percentage
1	<i>Juniperus excelsa polycarpus</i>	Juniper, 'Shukpa'	336	128	38
2	<i>Rosa webbiana</i>	Wild Rose, 'Siah'	336	11	3
3	<i>Hippophae rhamnoides</i>	Seabuckthorn, 'Tsermang'	336	37	11
4	<i>Lepidium latifolium</i>	'Shangsho'	288	568	197
5	<i>Tanacetum gracile</i>	'Burtsay'	120	0	0
6	<i>Ephedra intermedia</i>	'Chapat'	144	0	0
7	<i>Peganum harmala</i>	Wild Rue	144	12	8
8	<i>Krascheinnikovia sp.</i>	---	192	5	3
9	<i>Artemisia brevifolia</i>	'Khamchu'	72	0	0
10	<i>Carex sp.</i> - Unidentified grass		432	0	0
		Total	2,400	761	32%



Figure 1: Miyawaki Pilot Plantation



Figure 2: *Lepidium latifolium* (Shangsho) at Miyawaki Pilot Plantation at HIAL



Figure 3: Other Plants at the Miyawaki Pilot Plantation

Biofence Plantation

4,700 plants were planted in the bio-fence location of HIAL campus in March 2020. These were fairly grown plants, brought from a site in the later part of spring. They were planted as an experiment to see if these plants could be re-planted. They were planted on a soil prepared using the Miyawaki method. By Dec 2020, 200 plants were seen growing. This was more than those that appeared to have survived in July 2020. The actual survival rate will be known after spring this year. The three different native shrub species that were planted were: *Hippophae rhamnoides* – Seabuckthorn, *Rosa webianna* – Wild Rose and *Myricaria Germanica* – locally known as ‘Umbu’. The reason for low survival was the method of transplantation as well as the maturity of the plants. Having learnt from our mistakes, we plan to transplant younger saplings with smaller roots this year.



Figure 4: Biofence Plantation at HIAL

Apple Orchard

Apple Orchard work consisted of early winter mulching to protect trees from the cold in the last quarter. The natural jute fibre wind break is being used to protect the plants against the howling spring winds. The wind break is reinforced with wires attached to concrete as has been the practice since last year.

The saplings for the orchard extension work could not be sourced as Srinagar remained in a severe lockdown due to surge in Covid-19 cases. The lockdown led to the death of the saplings due to inability of the caretakers to be available to water the plants. We are hopeful that we will be able to source the 792 plants that we aim to plant in spring 2021, provided the roads open in time.



Figure 5: Soil work for Apple Orchard Extension

Greenhouse, Nursery Propagation and Outsourcing of Saplings

The greenhouse and nursery together at HIAL have around 2000 saplings that are ready to be planted in spring 2021. Additionally, in June and July 2020, we outsourced the task of sourcing plants to HIAL to some youth of Ladakh. An agreement was made between HIAL-Mr Konchok Norgay and HIAL-Mr Norphel to deliver a mix of 10,000 saplings each. This was done with the aim to encourage youth's involvement in plant propagation and provide additional source of income in villages to prevent city migration. The plants will be provided to HIAL in spring 2021.



Figure 6: Cuttings being propagated at the Greenhouse and Nursery at HIAL

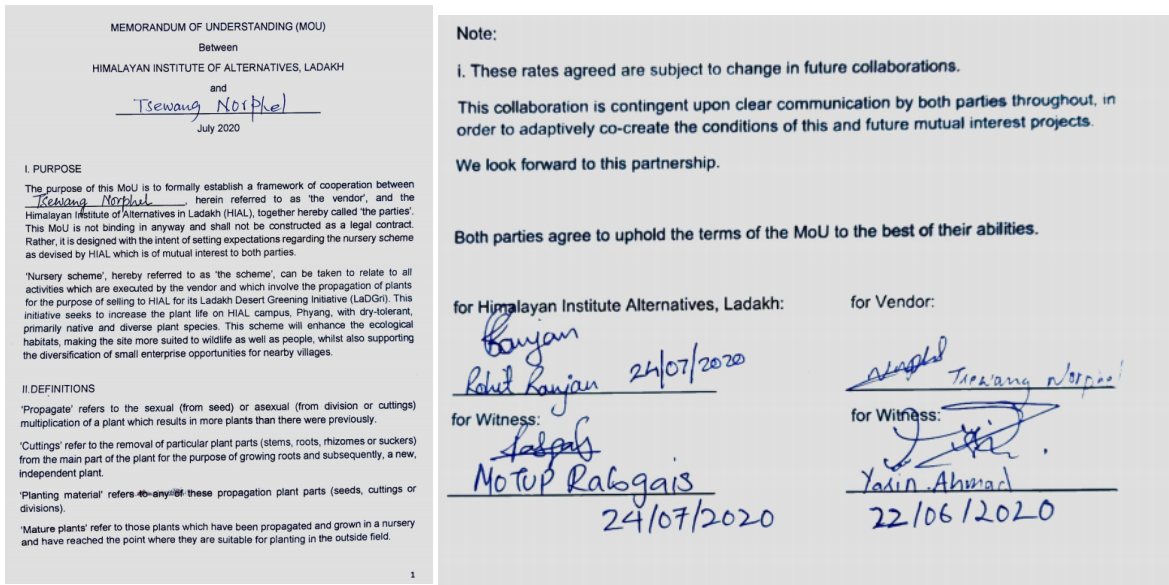


Figure 7: Snapshot of MoU for Nursery Scheme Outsourcing between HIAL and Mr Norphal

Cow Shed

The work for the cowshed and the root cellar was started towards the end of the working season but only limited developments could be achieved. The work will be completed in the new working season this year.



Figure 8: Cow Shed Under construction

Root Cellar



Figure 9: Excavation Work for Root Cellar

Challenges this Quarter

Covid-19 at HIAL Campus

HIAL had to face two lockdowns in the crucial months of October and November as its staff members turned out COVID positive. These lockdowns prevented any work to happen on site.

Skilled Worker Availability

HIAL, like other places in Ladakh, faced acute shortage of skilled and unskilled workers to uptake its work. We did manage to start some construction projects like the cowshed and the root cellar but had to leave them mid-way due to end of construction season.

Staffing

The plantation team saw the exit of two trained professionals on short notice leaving only lesser qualified staff to handle the plantation work. We have recently hired a team head to oversee the spring planning.

Financial Updates

Below are the summarised expenses we have accrued in these 6 months:

Opening Balance of MMT funds as on July 1st 2020: Rs. 9,13,180

Funds received against projected expenses and plantations for the next quarter (Jul – Sep 2020): Rs 25, 00, 000

Total Funds: Rs 34, 13, 180

Expenses Incurred:

Capital Expenditure

Cow-shed	1,38,125
Root Cellar + Pipe Burial	31,000
Material - Tools and Equipment	16,580
One Time Procurement - Facilities (21,082
Subtotal Capital Expenditure	2,06,787

Material

Manure and Saplings	84,040
Sub Total Material	84,040

Labour	75,000
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Facility - Moveable (Consultancy + JCB)	2,75,900
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Administrative Expenses

Salaries	6,70,669
Repairs & Maintenance	14,935
Greenhouse repairs	36,421
Fuel	28,525
Sub Total Administrative Expenses	7,50,550

Skill Development

Post-Harvest course (6 students, 3 months)	3,60,000
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Grand Total	17,52,277
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Plans for the Next Quarter, Jan – Mar 2021

The following activities are planned for Jan-Mar 2021:

- Saplings sourcing by HIAL staff for Greenhouses for autumn and next spring plantation
- Spring transplant from greenhouse to outside
- Sapling sourcing from “Nursery Scheme”
- Root cellar Construction
- Cow shed construction
- Apple Orchard extension
- Windbreak plantations
- Bio fence plantations
- Borewell Drilling and Irrigational channel set-up.

Greenhouse and Nursery Propagation – The Greenhouse & nurseries will be used to grow saplings for the Autumn 2021 & Spring 2022 plantation. For this internal irrigation systems are to be set up and labour is required to prepare planting beds. The contract for the second greenhouse construction will be finalised shortly and work will commence this quarter. This can house cuttings that can be collected in the autumn period.

Root Cellar – The root cellar work began in last quarter. It will be completed after the construction season starts. They will be executed by HIALs construction team and contract labour. They are crucial for long term storage of the produce of fruits from the orchards. It will ensure the food and nutrition security of staff and visitors during winter and is an essential facility of any Ladakhi household or residential institution.

Cow Shed – The shed to house the cows will be finished this season. This will contribute, not only to self-sufficiency in dairy products for HIAL staff and students, but to the necessary development of a closed-loop soil fertility system for future plantations. The dung and urine of the cows are a very important component of our organic fertilisers and having them in campus will ensure proper and continuous supply of them.

Apple Orchard Extension– We intend to plant new plants in the Apple orchard in spring. We are going to plant more cold-resistant varieties to improve the survival rates. For this we need to procure manure & have labourers & machines improve the soil of orchard rows. Plantation of trees will occur during Quarter 2 (after roads open to Srinagar).

Bio Fence Plantation – Through our ‘Nursery Scheme’ project, initiated in 2020, we have engaged two suppliers to collect planting material, in the form of cuttings, and grow them on their own land. They will then sell us these plants in the coming seasons. Of these 50,000 plants we are expecting, 20,000 will be supplied in spring and the further 30,000 in the spring of 2022. We seek to engage more suppliers in the coming spring of 2021. Other expenses under this project head will be for labourers to collect seeds and cuttings in autumn, and also to prepare potting bags on a huge scale, ready for a large planting material collection drive in the upcoming spring 2021. As the right season for collecting cuttings is short, we will spend this autumn and winter period preparing so we can be ready to do mass propagation in our nursery next year.

Windbreak Plantations – With the consultancy expertise of the former Divisional Forest Officer of Leh, we plan to plant 20,000 fast-growing, drought-tolerant trees strategically around the HIAL site to reduce wind velocity. The number of these plants can be increased provided the site can match the water requirements. This will be decided upon after the first 20,000 plants have been planted.

New Borewell – The drilling will commence on the third borewell on site mainly for plantation purposes. Also the second borewell, which could not be completed due to breakage of drill equipment of the supplier will be completed this quarter. It was supposed to come up in the second half of 2020 but had to be continuously be postponed first due to COVID related lock downs followed by unavailability of the borewell machines and operators as they were taken to the china borders for army related works. When the second borewell work finally commenced in November at HIAL site, technical faults of the operator made the machine unfunctional. The work had to be stopped till the next season. It is expected to commence in March this year. The second as well as the third borewell is crucial for the desert greening process as we have learnt from the Miyawaki plantation that new saplings need water to survive. This will make a significant difference to the ease of daily operations for plantation team staff as it will distribute the competition of this resource amongst myriad site activities.

Fencing – The fencing work also suffered due to low availability of laborers and certain encroachment issues. However, the problem was solved and the work will begin in this quarter. It will protect plantations from potential damage, particularly from animals. This site-wide fencing will be more efficient than individually fencing each individual plantation.

Capital Expenditure

3rd Borewell	18,00,000
Cow-shed	10,61,875
Root Cellar	5,00,000
Sub-total	33,61,875

Material

Saplings transportation and plantation from Srinagar	25,00,000
Saplings from Nurseries in Ladakh	3,02,500
Apple Orchard	5,75,000
Sub-total	33,77,500

Administrative Costs

Direct Salaries	2,70,000
Repairs & Maintenance	1,00,000
Fuel	30,000
Project Management Personnel	1,50,000
Sub-total	5,50,000

Skill Development

Pre-harvest Course	3,60,000
Sub-total	3,60,000

Grand Total	76,49,375
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Amount Requested from MMT for Quarter Jan – March 2021:

Rs 76,49,375 + Rs 17, 52, 277 – Rs 34, 13, 180 = Rs 59, 88, 472 (Rs 60 lakhs rounded off)

HIAL-MMT Ladakh Desert Greening Project – A Snapshot

The Himalayan Institute of Alternatives, Ladakh (HIAL) is undertaking a massive Desert Greening initiative with the immense support of the Make My Trip Foundation (MMT Foundation). The campus of this new education institute is situated on a desert area of 125 acres in a valley of Ladakh, approximately 20 kilometres from the region's main city of Leh. HIAL's vision is to create an alternative and sustainable development model for the Hindukush Himalayas and to mountain regions beyond. HIAL is focused on creating new paradigms of 'learning by doing' whilst creating a platform for the rejuvenation and incorporation of indigenous knowledge and contextual-based learning.

The Make My Trip Foundation is a public charitable trust and is passionate about sustainable and responsible development in India. The Foundation hand selects initiatives to support which are working to promote and ensure environmental sustainability, carbon sequestration and responsible tourism. They believe in inclusively supporting disadvantaged communities throughout India across sectors like education as well as ecological restoration. In funding the formative stages of HIAL's Desert Greening initiative, they are helping to establish the foundation for ongoing carbon sequestration and biodiverse land generation which will have impacts far beyond the campus boundary.

The greening of HIAL's campus, funded by the MMT Foundation, will provide a strong platform and hub for research and development of desert afforestation techniques and methodologies that seeks to inspire and inform other high-altitude mountain regions of the Himalayas and the world. The Forestation team at HIAL is parallelly working on building up the capacity of the site's infrastructure, knowledge base and planting material resources to support large scale plantations on this campus. With this strong foundation, the Forestation project is working towards greening 70% of HIAL's campus with perennial and native plant species. This greening will have a plethora of localised benefits: from sequestering carbon; providing enhanced human habitat for staff and student residents; creating new ecological habitat for wildlife including birds, insects and reptiles; increase the water-holding capacity of the landscape - allowing for water conservation and reducing the water run-off and soil erosion which can contribute to catastrophic flooding events in mountain valleys.

As the capacity of HIAL's Forestation initiatives advances, through the support of the MMT Foundation, these localised approaches, experiments and successes can be spread throughout similar regions to produce widespread benefits. This alternative educational institute can be one of the many catalysts necessary to create a stronger movement towards localised solutions to global and shared problems.