



HIMALAYAN INSTITUTE OF ALTERNATIVES, LADAKH

An Alternative Institute for Mountain Development

HIAL Desert Greening Initiative

QUARTERLY (11TH) PROGRESS REPORT JULY TO SEPTEMBER 2021



FUNDED BY



Executive Summary

In this quarter we did regular monitoring of different plant species planted in greenhouse, trenches and in open field condition. Growth and survivability of plants at HIAL, Nubra and Kargil were studied. Survival percentage ranged from 0% for untimely plantation, to more than 90% for plants that are planted at the right time, on an average 28% survivability was observed at HIAL. Nubra and Kargil plantations showed more than 90% survival. This suggests that the time of plantation is a key area of consideration while doing plantation. On the other hand full landscape planning of HIAL is also going on with the support of landscape designer Aniket from Future Institute and to create a sustainable ecosystem. A course on permaculture design was also attended by our plantation head at Aranya Agricultural Alternatives, Hyderabad in the month of August. Apple harvesting was also performed in this quarter and construction of three different trenches for winter cultivation and compost preparation has also been started. This summer season went longer than we expected therefore we couldn't do autumn planting at the end of October however complete planning has been done and will be completed in this quarter.

The table below summarises the plantation done so far and their survival count.

	2018-19	2019-20	2020-21	April-June	July - Sept	Total plants planted	Survival count till date
Biofence plantation	-	4700	500	810	-	6010	918
Saplings from nursery scheme	-	-	-	40000	-	40,000	6,000
Apple orchard	264	-	-	-	-	264	174
Apple-Apricot orchard	-	35	9	-	-	44	29
Kargil plantation	-	-	10000		-	10000	8,231
Nubra plantation	-	-	1500		-	1500	1,485
Miyawaki Plantation	-	2400	-	-	-	2400	506
Yearly Total	264	7135	16509	40810	-	64,718	17,343
Survival % till date							28.8

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Project progress report:

Biofence plantation:

Survival study of different drought resistant plant species planted from March to June 2021 viz. *Robinia pseudoacacia* (Kikar), *Rosa webbiana* (Syah), *Hippophae rhamnoides* (Seabuckthorn) and *Elaeagnus angustifolia* (Sarsing) , were analysed. Survivability of different plant species ranged from 4% to 98% and on an average 15.3% were observed during the plantation period (Table-1). March plantation gave better performance as compared to June plantation.

Table1: Lists of different plant species planted in open field (biofence) in the year 2021, plantation from 2019-21 their survival percent

S.no	Plant species	Time of plantation	Number of saplings planted	Number of saplings survived	Survival percent
1)	<i>Robinia pseudoacacia</i> (Kikar)	March	139	133	95.7
2)	<i>Rosa webbiana</i> (Syah)	March	106	62	58.5
3)	<i>Hippophae rhamnoides</i> (Seabuckthorn)	March	56	52	92.9
4)	<i>Elaeagnus angustifolia</i> (Sarsing)	March	509	371	72.9
	Sub Total		810	618	76.3
	Plantation in 2019-20	-	4700	200	4.25
	Plantation in 20-21	-	500	100	20
	Total	-	6010	918	15.3



Fig 1: Bifence plantation



Fig 2: Biofence plantation

Greenhouse/ trench seedling/ planting material raising (Saplings from nursery scheme):

We planted 4000 and 6000 seeds of Robinia and Artemisia respectively and 30,000 cuttings of seabuckthorn. 70% and 53% survivability was observed in Robinia and Artemisia respectively (Table 2) however due to late plantation all the cuttings of seabuckthorn not survived.

Table 2: Survivability of Kikar and *Artemisia annua* by seed sowing and sea buckthorn by cutting (Sapling from nursery scheme)

S.no	Plant species	Time of sowing/plantation	Number of plant sown	Plant survived	Survival percent (%)
1.	<i>Robinia pseudoacacia</i> (Kikar)	March	4000	2800	70
2.	<i>Artemisia annua</i> (Artemisia)	March	6000	3200	53.3
3	<i>Hippophae rhamnoides</i> (Seabuckthorn)	June end	30000	0	0
	Total		40000	6000	15



Fig 3: Robinia pseudo acacia sapling ready for transplant



Fig 4: Artemisia annua ready for seed harvest

Apple orchard yield:

We got 66% survivability from the apple orchard plantation performed in the year 2019. Similarly, we also obtained enough yield of apples from these plants. Yield of the plant ranged from 1 no. to 23 no.s per plant (Table 3). However, some challenges were encountered due to water shortage; some apples dropped before ripening.

Table 3: Survival percent of apples in apple orchard and yield per plant

S.no	Plant planted	Plant survived	Survival percent	Range of apple yield per plant in no.s and average yield
1	264	174	65.9	Max: 23 no.s per plant



Fig 5: Apple yield from apple orchard in 2021



Fig 6: Apple yield from apple orchard in 2021

Apple-Apricot Orchard:

Survival count of the apple apricot orchard has been shown in table 4. The plants are too young to yield any fruit.

Table 4: Survival status of apple- apricot orchard near residence

S.no	Plant species	Total planted	Total survival	Survival percent
1)	Apple	36	25	69
2)	Apricot	8	4	50
	Total	44	29	65.9

Kargil and Nubra plantation result:

Plantation in different villages of Kargil and Nubra was carried out in the year 2020-21. Plantation drive was not continued further in these villages as it was going out of our project scope. Survival count of Kargil and Nubra plantation done in the month of august 2021 is shown in table 5.

Table 5: Survival count of Kargil and Nubra plantation:

S.no	Total plants planted	Total plants survived	Survival percent
Kargil Plantation	10,000	8231	82.3
Nubra Plantation	1500	1485	99
Total	11,500	9716	84.5



Fig 7: Kargil plantation



Fig 8: Nubra plantation

Survival of Miyawaki Pilot Plantation:

Below are the list of the 10 species which were planted in the Miyawaki Pilot Plantation Forest in March 2021. Five out of ten species have suffered moderate to severe losses and range between 0%- 13% survival . Four species have shown no survival whilst one species, *Lepidium latifolium*, has proliferated, nearly doubling itself from the original number planted. This suggests that the standardised method of Miyawaki technique is not applicable in context to Ladakh's topography and climate. However, the method can be applied in the future with modifications developed after due research.

S. No.	Botanical name	Common name	Planted	Survival Jun- 21	Percent age
1	<i>Juniperus excelsa polycarpus</i>	Juniper, 'Shukpa'	336	46	13%
2	<i>Rosa webbiana</i>	Wild Rose, 'Siah'	336	8	2%
3	<i>Hippophae rhamnoides</i>	Seabuckthorn, 'Tsermang'	336	21	6%
4	<i>Lepidium latifolium</i>	'Shangsho'	288	414	69%
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	14	9%
8	<i>Krascheninnikovia sp.</i>	---	192	0	0%
9	<i>Artemisia brevifolia</i>	'Khamchu'	72	3	4%
10	<i>Carex sp.</i> - Unidentified grass		432	0	0%
		Total	2,400	506	21%

Permaculture design course:

HAL decided to take a relook at its desert Greening Initiative and invited the core team members of Aranya Agricultural Alternatives, Telangana, Hyderabad. They are known for their desert greening initiatives through permaculture. Our plantation head also attended a 15-day permaculture design course at Aranya Agricultural Alternatives, Telangana, Hyderabad. The course briefed about the type of plant species that are suitable for high altitude regions in addition to the existing methodology for improving the soil and creating any region into permaculture, keeping three ethics and nine principles of permaculture into consideration while developing any land into permaculture. Hence, some projects like construction of compost trenches have already been started. The Permaculture principle stressed upon dense plantation, compost making, contour plantation, site analysis etc. This will help in increasing the survivability count of plants planted at HAL. Fig: 9 represents an aerobic compost prepared during the course.



Fig 9: Aerobic compost preparation at Permaculture design course

Compost trench and nursery raising trench preparation:

Construction of two nursery raising trench and one compost trench is under process. Nursery raising trench will be utilized for raising the cuttings of different plant species in winter whereas autumn leaves of deciduous plants (to be collected from all the forest lands) along with horse and goat manure will be utilized for compost preparation.



Fig 10: Trench construction under process

Challenges of the current quarter:

Since this time, the summer season in Ladakh remained for a longer time as compared to earlier seasons. Planting for the Autumn season is yet to start. We expect to finish it in the next quarter once we begin the process.

Table 6 : Complete expenditure detail of July to september 2021

Balance on 17th July 2021:34,49,229

Budget head	Quantity required	Rate (in Rs)	Total amount (in Rs)	Total expenditure as on 30 Sept. 2021	Unspent as on 30. Sept. 21	Remarks
Sapling Raising/ Storage Facility						
Greenhouse	1	-	13,00,000	0	13,00,000	Construction will be done from fund of next project
Material						
Drip irrigation set and installation charges	7,500m	30/m (approx)	2,25,000	189086	35914	Set purchased, installation is remaining
Waterproof shoes	10	1,200 per pair	12,000	₹8,090	674	Purchased
Nursery Raising Pots	200	300 per piece	60,000	0	60,000	Purchase under progress
Gloves	20 pairs	300 per pair	6,000	0	6000	Purchase under progress
Black mulching plastic	10 rolls	5,000 per roll	50,000	60000	-10,000	Purchased @ 6000 per roll.
Sintex (1,000 L)	2	10,000	20,000	19,875	125	Purchased
Pipes	2	9,500	19,000	9,200	9,800	Purchased at lesser price
	Sub-Total 1					
Equipment						

Vernier Caliper	2	2,500	5,000	2100	2900	One is purchased and another is pending
	Sub- Total 2		5,000			
Admin						
Direct Salaries (5 person)	3 months	351,000	351,000	342,548	8452	
Fuel		approx	50,000	30,000	20,000	
Repair and Maintenance (including 3 Trenches)	3	50,000	2,00,000	0	2,00,000	Maintenance is needed to be done
Transportation		approx	50,000	0	50,000	
Admin expenses	3 months	23,125	69,375	59,076	16,607	Including training expense
Recurring (misc.exp)	-	-	10,000		10,000	
	Sub- Total 3		7,30,375			
Saplings+Plantation						
Sapling+Cutting	50,000	40	20,00,000	0	20,00,000	Not begin due to delay of autumn season
Labor	50,000	15	7,50,000	0	7,50,000	Not begin due to delay of autumn season
JCB (approx 800 hours)	800	1000	8,00,000	0	8,00,000	Not for sapling but used for biofence site digging from previous quarter

Trench with polycarbonate	3	1,00,000	5,00,000	173,640	326,360	Work is under process and expenditure will be shown in next quarter
	Sub- Total 4		40,50,000	893,615	55,96,832	
	Total		₹64,77,375			

Table 7: Budgetary breakdown for next quarter (Oct - Dec 2021)

Budget head	Quantity required	Rate (in Rs)	Total amount (in Rs)	Carry forward from earlier quarter
Material				
Nursery Raising Pots	200	300 per piece	60,000	-do-
Gloves	20 pairs	300 per pair	6,000	-do-
Subtotal-1			66,000	-do-
Admin				
Direct Salaries (5 person)	3 months	3,18,000	3,18,000	-do-
Fuel		approx	50,000	-do-
Transportation		approx	50,000	-do-
Admin expenses	3 months	23,125	69,375	-do-
Recurring (misc.exp)	-	-	20,000	-do-
Subtotal-2			507375	
Saplins+Plantation				
Sapling+Cutting	5,000	100	5,00,000	-do-
Labor	50	800	40,000	-do-
Repairs of Trench with polycarbonate (Nursery raising trench)	2	50,000	1,00,000	-do-
Compost trench	1	60,000	60,000	-do-

Subtotal-3			7,00,000	
	Total		12,73,375	

Balance as on 1st October 2021: Rs. 25,55,614

Required from MMT : Requirement details and breakups from Jan 2022 for next four years will submit separately

Beneficiaries from MMT project to locals

- Reducing Carbon Footprint

o Number of saplings planted (quarterly):

No plants have been planted in this quarter as Ladakh has only two planting season i.e. Feb-June or Sept/Oct.-Dec.

o Survival rate (end of the year):

Please refer Table 1-7.

- Supporting Local Economies (can look at from the lens of labour/gardner involved in plantation/project related activities)

o Number of local job opportunities/livelihoods generated (beginning of year as per

projected plan, and end of year as per actuals):

This quarter:5

o Monthly income generated from activities supported by the project (quarterly):

This quarter generated Rs 2,34,000 from local human resources employed under the project

- Gender Inclusion & Empowerment (subset of the above mentioned - can look at from

the lens of labour involved in plantation/project related activities)

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o Number of women beneficiaries (beginning of year as per projected plan, and end

of year as per actuals): Women: 3

o Monthly income generated for women beneficiaries from activities supported by the project (quarterly): Rs 78,000 per month for the quarter

Plan for next quarter:

- 1) Completion of trench construction
- 2) Collection of leaves from forest lands and compost preparation on larger scale
- 3) Trial on Autumn plantation (This time we will do a small plantation as autumn plantation does well in other parts of Ladakh but no trial has been done at HIAL so far.
- 4) Seed sowing and cutting plantation in greenhouse, trench and open
- 5) A full proposal of the future work plan for the financial year 2021-2025 will be sent separately.