Monitoring of Restoration Sites in Chamba

Ecological restoration is important because it helps reverse the degradation, damage, and destruction of ecosystems. It is especially vital in places where many people depend on natural resources for their livelihoods. In Chamba, Himachal Pradesh, restoration work has been carried out on agricultural land and forest land since 2024, with active involvement from local communities.

Monitoring at the restoration site in Dugli Village. © Sachin Verma.

Monitoring these restored sites is equally important because it helps us understand the condition of saplings and tree guards after plantation. It also allows us to record sapling survival, the condition of tree guards, and the overall success of the restoration efforts.

Study Area and site description

Monitoring was carried out at several restoration sites in Chamba District, Himachal Pradesh, during March and April 2026. These sites included both nonarable farmland and degraded forest land restored in 2024 and 2025. The restoration work involved 23 stakeholders from eight villages who willingly offered their non-arable land for the project.

Among them, five stakeholders were from Chinjoti, four each from Dugli, Jhalein, and Langa, three from Randoh, and one each from Baadi, Matwardi, and Basodan villages.

The elevations of the restored sites range 1,600–2,100 m. Since the sites are located at different elevations and have different site conditions, selecting suitable plant species for each location is important for better survival and growth.

The restored sites in Chamba support a mixed native species approach which supports ecosystem restoration, mitigates crop-raiding by wild animals, benefits livelihoods, contributes to long-term ecosystem stability, and builds climate resilience.

Methodology

Field monitoring was conducted through site visits during March and April, 2026. At each restoration site, observations were recorded manually on the condition of tree guards and saplings. Through the observation, the survival rate of saplings was assessed.

List of the plant species used in restoration in the years 2024 and 2025

	Chambiyali name	Scientific name	English common name
1	Gu	*Aesculus indica*	Horse Chestnut
2	Deyyar	*Cedrus deodara*	Deodar
3	Phagra	*Ficus palmata*	Wild Fig
4	Dhaman	*Grewia optiva*	Bihul
5	Akhrot	*Juglans regia*	Walnut
6	Darek	*Melia azedarach*	Himalayan Neem
7	Krun	*Morus serrata*	Mulberry
8	Poplar	*Populus ciliata*	Poplar
9	Chulli	*Prunus armeniaca*	Wild Apricot
10	Pajja	*Prunus cerasoides*	Wild Himalayan Cherry
11	Dhadu	*Punica granatum*	Wild Pomegranate
12	Kainth	*Pyrus pashia*	Himalayan Pear
13	Ban	*Quercus leucotrichophora*	Ban Oak

Damaged tree guards due to forest fire. © Amrin Ansari.

Monitoring in landslide affected area. © Jayoti Bardhan.

Sapling of Punica granatum without a tree guard. © Shreya Yadav.

The following parameters were documented:

- Number of upright tree guards
- Fallen tree guards
- Bent tree guards
- Missing tree guards

Result and Observations

Condition of Tree Guards

The condition of tree guards varies from site to site. At many sites, tree guards were found fallen, damaged, bent, or stacked together. This usually happens because of strong winds, heavy rain, snowfall, forest fire, livestock movement, and human disturbances. In some sites, where the tree guards were properly fixed, and those sites showed better survival growth rate. The difference in stability of the guards is also due to the soil conditions, which hampers some from being erected stably.

Sapling Growth

The growth of saplings depends on the species. Some fast-growing native species have already reached a good height, while others are still small and delicate. However, some hardy plant species are growing well even without tree guards.

At one site in Matwadi, where a landslide occurred last year, 34 out of 67 saplings are still surviving without tree guards. One reason for this may be due to the slippery soil that the nomads do not take goats or cattle for grazing in the landslide affected area.

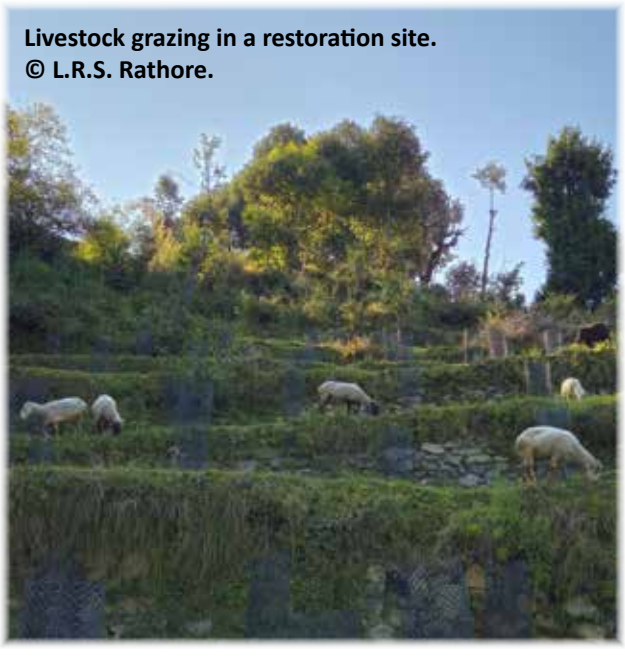
Site-wise Variation

Sapling survival and the condition of tree guards differ from site to site. Some sites show a good survival rate, while others have exhibited poor survival. The highest survival rate was recorded at Reena's farm in village Dugli (94.92%), followed by Ramesh's farm in village Basodan (92.67%), where no major natural disasters were reported post restoration. In contrast, the lowest survival rates were observed at Jaiko Ram's farm in Jhalein (16%), Miyadigala forest fragment (46 %), Roshni's farm in village Matwari (50.74%), mainly due to the impacts of natural calamities. The former land faced a forest fire in November 2024, which took a toll on the restored saplings, resulting in the death of 84% (42 out of 50) saplings. The latter two sites were swept away due to landslides, leading to the devastating result. Even among the landslide affected sites, the variation is noticeable. One landslide site is showing comparatively better sapling survival, while the other is in much worse condition, with only around 92 saplings remaining out of 200 planted saplings. The following table depicts

Table 1. Site-wise sapling survival rates and number of surviving saplings.

Year of restoration	Name of stakeholder	Village	Area	No. of saplings planted	Surviving saplings (April 2026)	Survival rate (%)
2024	Shakti kumar	Dugli	592.81	100	89	89
	Shanti devi	Dugli	245.93	45	40	88.88
	Pooja	Baadi	1247.33	300	267	89
	Roshni	Matwari	275.4	67	34	50.74
	Jaiko ram	Jhalein	229.66	50	8	16
	Vikram	Jhalein	872.47	150	140	93.33
	Anil	Jhalein	1212.33	260	226	86.92
2024 & 2025	Forest land (near nursery)	Dugli	270.41	183	171	93.44
2025	Beena	Dugli	222.20	50	42	84
	Reena	Dugli	98.91	138	131	94.92
	Seema	Chinjoti	331.27	150	470	88.01
	Indra	Chinjoti	60	75		
	Kailasho	Chinjoti	565.18	79		
	Parsuram(Pushpa devi)	Chinjoti	375.50	80		
	Chaman lal	Chinjoti	535.20	75		
	Pankaj Kumar	Randoh	453.50	75		
	Nirmal & Nathuram	Langa	1795	320	224	70
	Seema	Langa	807.15	382	326	85.34
	Darbari	Langa	385.59	100	94	94
	Rajkumar	Jhalein	764.49	202	157	77.72
	Bhagto	Randoh	576.74	184	169	91.84
	Pawan	Randoh	527.76	50	45	90
	Ramesh Puri	Basodan	3558.71	805	746	92.67
	Forest land	Miyadigala	24318.63	200	92	46

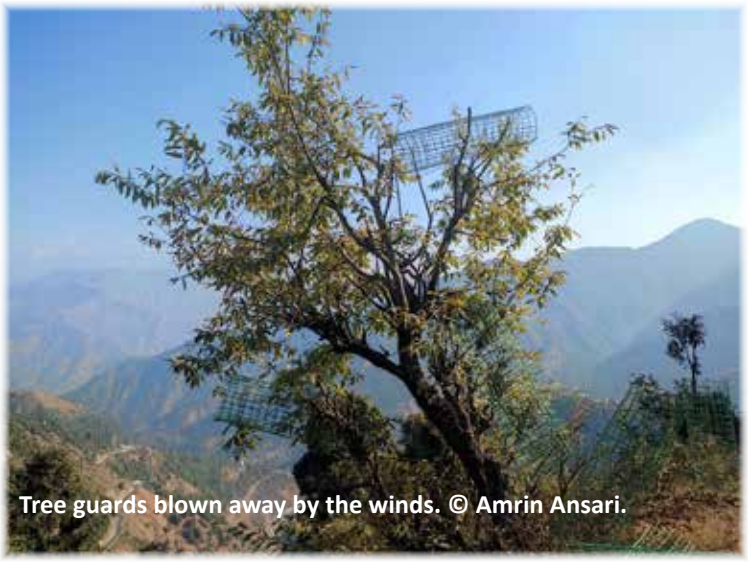
the restoration details along with the present survival rates of the restored saplings.



Livestock grazing in a restoration site. © L.R.S. Rathore.

Challenges Observed

At all restoration sites, tree guards were found fallen or bent. The main causes of damage were strong winds, rain, and snow, in combination with loose soil to hold the guard down. During winter, saplings face greater difficulty in surviving because of snowfall. Small saplings are often unable to withstand the pressure of snow and eventually die. Strong winds also shift tree guards from their original position or blow them away. This was one of the most common


Tree guards blown away by the winds. © Amrin Ansari.


Tree guards in Baadi Village. © L.R.S. Rathore.

challenges observed across the sites. Saplings without tree guards also become more vulnerable to grazing by goats and cattle.

At some sites, it was observed that certain plant species were drying and needed water at regular intervals. In Basodan Village, a few Ban Oak trees were found dried up. This was mainly because the site was exposed to direct sunlight, which likely affected the survival of this species. In contrast, another site in Randoh Village showed a good survival rate of *Aesculus indica*. Survival rate depends on the species and the environmental conditions.

Human disturbance was also noticed at several restoration sites. In some places, tree guards that had fallen or blown away were taken by local people and reused to protect their own non-native trees near houses. Some were also used for fencing around homes. At one site in Jhalein, tree guards were being used as support for cucumber plants since they are climbers and can easily grow with such support. In another site in the same village, most of the tree guards had been removed and used for personal purposes. Another challenge was the lack of proper maintenance. We regularly request stakeholders to care for the tree guards and saplings, but while some people do this sincerely, others do not give the same attention.

Conclusion

The monthly monitoring provides important insights into the current condition of restoration sites. While several sites showed encouraging survival and protection status, some areas require timely maintenance and continued monitoring. Consistent field assessment will help improve restoration effectiveness, encourage local participation, and long-term ecological recovery.

Shreya Yadav & Amrin Ansari
Himalayan Restoration Project, Zoo Outreach Organisation, Coimbatore, Tamil Nadu, India.

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