

Fodder Production in Common Lands: An Impact Narrative from Uttarakhand, India

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Introduction

The state of Uttarakhand, located on the foothills of the Himalayan ranges, is blessed with natural forests. Many of its regions are geographically inaccessible to other parts of the country. This inaccessibility combined with a deprived socio-economic status has made local inhabitants completely dependent on nearby forests, to meet their fuel (wood) and fodder demands.

The farmer community has traditionally depended on these forests for feeding their livestock. However, significant growth in the human and cattle population in the last few decades has resulted in reduced availability of fodder and a resultant increased pressure on forests. Overharvesting of tree leaves, unregulated overgrazing and unsustainable methods of fodder extraction have therefore evoked great concerns about meeting the demand of fodder for livestock and more importantly, sustainability of forests in the Himalayan region.

The Problem

Livestock rearing is an important livelihood activity in Uttarakhand, even though fodder availability has always been a challenge for farmers. Small size of farm holdings and low level of irrigation, are some of the factors that have prevented farmers from engaging in fodder cultivation. According to 2003 census estimates, the state has a shortage of about 92.28 lakh tons of green and 16.29 lakh tons of dry roughage, averaging a total of about 108.57 lakh tones per annum (as against the requirement of 251.71 lakh tons and the availability of 143.14 lakh tons³), which is further compounded by wasteful storage and feeding practices. To compensate insufficiency of fodder, women are compelled to go deep into the forest to collect tree leaves. This adds to their drudgery, since they have to walk long distances and then carry the heavy load that must suffice for their current use and future needs. This activity of fodder collection from forests has been identified as the single most important cause of the rapid deterioration of forest quality and growth.

Studies have shown that feed and fodder together constitute approximately 60-70% of the total cost of milk production. 'Fodder cultivation' then assumes an extremely important role in the task of economical milk production. In the context of Uttarakhand too this could be a significant adaptation

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³ Singh, K. and Singh, H.S. 2009. Forage resource development in Uttarakhand: Experience and observations.

with potential to reduce dependence on forests for fuel and as also the level of drudgery women have to go through to procure the same.

Redressal of the Issue

A pilot project was initiated in 2007 by the Himmatthan Society, a state level Non Governmental Organization (NGO) in Uttarakhand, with the support of other grassroots NGOs. Together, they cultivated fodder in the *panchayat's* common land of 15 villages, spread over seven districts by utilizing funds from the National Rural Employment Guarantee Program (NREGA)⁴. This successful experience, led to the conceptualization of the Integrated Fodder and Livestock Development Project (IFLDP). A key objective of the project was to produce green fodder in two kinds of common land:

- (i) Village common land which is usually a wasteland that is not used for any productive work
- (ii) *Van panchayat* land or forest land which is managed by village forest councils

The project's implementation was carried out systematically, following a chronological set of steps:

Identifying land: 585 plots covering 1,757 hectares of common land in 162 villages in the five districts of Tehri, Chamoli, Nainital, Bageshwar and Pithoragarh, falling under three different altitudes such as sub-tropical (600-1200m), intermediate (1200-1800m) and temperate (>1800m), were earmarked for fodder production activities.

Undertaking preparatory tasks: Pre-plantation tasks, such as land cleaning, stone walling, terracing as well as purchase/arrangement of manure, planting materials and other supplies were carried out.

Planting and planning for future consumption: A silvi-pastoral system was established with multilayered grasses, shrubs and trees to make sure fodder was available through the year. In the sub-tropical area, frost tolerant winter grasses such as Napier (*Pennisetum purpureum*), broom grass (*Thysanolaena maxima*) were grown, whereas cocks foot (*Dactylis glomerata*), tall fescue (*Festuca arundinacea*) and brome (*Bromus inermis*) were planted in temperate and intermediate areas. Fodder trees and shrubs like *Bauhinia variegata*, *Morus alba*, *Quercus leucotrichophora*, *Grewia optiva*, *Arundinaria falcata* (ringal) and *Dendrocalamus strictus* (bamboo) were planted in between contour terraces. On an average, 6 to 15 quintal of fodder root slips were used per hectare, in addition to 611 saplings of shrubs and trees that were planted (per ha) between contour terraces. Additionally, 160,026 fodder seeds were directly sown to further reduce cost of plantation.

Getting plantation under way: Plantation work was carried out during the monsoons by the MGNREGS Job Card Holders (JCH) under the supervision of *Gram* or *Van Panchayats*. Members of the Women Livestock Producers Group⁵ played a key role in their respective villages. They established and maintained fodder plots and were paid daily wages (utilizing funds from MGNREGA) along with entitlements to use fodder established in the *panchayat* common land.

⁴ MGNREGA under the Ministry of Rural Development aims at enhancing the livelihood security of people in rural areas by guaranteeing 100 days of wage employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work

⁵ Livestock producer groups are self-help groups formed by Himmatthan Society to encourage dairying by women

Distributing fodder: The fodder thus obtained was shared equally amongst all members of the Livestock Producers Group. Where fodder was produced in the forest common land, women had to pay an access fee of Rs10-Rs30 per annum to access the fodder. While funds to the tune of Rs3.48 crore were leveraged from MGNREGA (for establishing 1093 ha), Himmotthan provided all necessary technical support to establish 1,757 ha, apart from meeting select expenses where fund shortage was noticed (total expenses by Himmotthan were about Rs1.28 crore).

Results & Impact

An independent study was carried out by the Center for Ecology Development and Research (CEDAR) on the impact of “fodder production in common lands”. The study was conducted in a cluster of 21 villages of the five abovementioned districts, representing regions in all three altitudes, namely sub-tropical, intermediate and temperate. Here, fodder cultivation was taken up under the IFLDP project, highlighting performance in terms of productivity of fodder plots and impact on soil moisture, soil conservation and other ecosystem services. These have been explained in some detail below:

Impact on productivity: Total grass production in the IFLDP fodder plots was two to three times higher than the grass production undertaken in the non silvi-pasture areas. Total production in six years of intervention from 1,757 ha in 162 villages was found to be 6,74,490 quintals, with average productivity of 384 quintals/ha/year whereas, productivity in the non IFLDP area it was found to be only 135 quintals/ha/year. Another finding was that productivity differed along the altitude. Average annual productivity of grasses was highest (452 quintals/ha/year) in the subtropical range, followed by intermediate (441 quintals/ha/year) and temperate (230 quintals/ha/year) ranges. Productivity also differed along the hill slope position and was high in lower slopes (210quintals/ha/year) followed by mid slopes (179quintals/ha/year) and upslopes (70 quintals/ha/year).

Quantum of benefit

- Overall, through silvi-pasture intervention, an additional quantity of 26,24,958 quintals of fodder grass was produced in common land (249 quintals/ha/year) benefitting 3600 households
- Soil organic carbon, nitrogen, phosphorus and potassium levels showed marked improvement

Impact on soil moisture, soil conservation and other ecosystem services: Soil physico-chemical properties changed with plantation activities in the common land. Results from soil samples collected from IFLDP (silvi-pasture) and non-IFLDP lands suggest that soil moisture, soil organic carbon percentage and macro nutrients were higher in the former plots as compared to the adjoining non-IFLDP land.

Marked improvements noted

- Soil moisture in silvi-pasture fodder plots was (20%) as compared to adjoining land (14%)
- Marginally, higher soil organic carbon was observed inside fodder plots (1.12%) as compared to adjoining land (0.89%)
- Nitrogen percentage was slightly higher (0.13%) as compared to adjoining plots (0.11%); phosphorous content was 24.14 ppm in silvi-pasture area as compared to 19.49 ppm in the adjoining land; and potassium content was 124.38 ppm in intervened plots and 98.00 ppm in non-intervened plots

Improved fodder quality and access: The project played a vital role in encouraging farmers to cultivate fodder and make efficient use of common lands. Apart from increase in fodder production and soil productivity levels, the fodder obtained from these plantations was now of much better quality, which had cumulative impact on increasing milk yield and economic status of the household. Since common lands are usually in or near the village, they are easier to access and do not entail traveling long distances to collect fodder.

Welcome relief

Availability and ease of access to fodder increased in the project areas. It induced ecological rejuvenation of some local forest tree species, which were not able to regenerate due to chronic disturbances prevalent in Himalayas as a consequence of fodder lopping.

Merit in Scaling-up and Need for Policy Change

There is now evidence to suggest that fodder production in common lands has the potential to considerably reduce fodder shortage in a given area. Further, it can improve physico-chemical properties of soil and reduce soil erosion. Convergence of the project with MGNREGA generated about 211,152 days of employment and provided job cards to almost 8,096 rural men and women. Though there is a limit for expanding the project due to the limited availability of suitable common land, it is recommended that it should be extended to as many areas as possible, given its impact.

With over 3 lakh ha cultivable wastelands currently available in the state of Uttarakhand, which are in degraded condition, the government should seriously consider allocating degraded *panchayat*/forest lands to local community organizations. These can then be used for establishing silvi-pasture in these areas by collaborating with credible NGOs and dovetailing funds from MGNREGA or similar programs.