



Feminisation of Agriculture in the Western Himalayas: Drivers, Challenges, and Implications for Sustainable Rural Livelihoods in Tehri Garhwal, Uttarakhand

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The increasing participation of women in agricultural activities has emerged as a significant feature of rural transformation in the Western Himalayas. This study examines the drivers, challenges, and livelihood implications of the feminisation of agriculture in the Tehri Garhwal district of Uttarakhand. The research was conducted in three villages (Bhattgaon, Sajwan Kanda, Regoli) at different altitude zone representing the role of women in agriculture. Primary data were collected from 30 women farmers (10 respondents from each village) using a structured questionnaire, household interviews, and field observations. Respondents were selected through random sampling of farming households. Descriptive statistics, percentage analysis, and thematic interpretation were employed to analyse the data. The findings indicate that male out-migration, declining farm labour availability, changing cropping systems, and livelihood diversification have accelerated the feminisation of agriculture. Women now perform most farm operations and increasingly participate in decision-making; however, limited access to land ownership, agricultural extension services, credit, mechanisation, and markets continues to restrict their productivity. The study concludes that strengthening institutional support, gender-responsive agricultural policies, skill development, and improved resource access are essential for enhancing sustainable rural livelihoods in the Himalayan region.

Keywords: Agriculture, Feminisation, Himalayan Region, Rural Livelihood, Women Farmers,

Introduction

Agriculture in the Himalayan region has traditionally been a family-based occupation in which women have played an important role in farming and household management. However, over the past few decades, the role of women farmers in hill areas has changed significantly due to socio-economic transformation, climate variability, changing livelihood strategies, and large-scale male out-migration. As men increasingly migrate to urban centres in search of employment, women have become the principal actors in agricultural production and natural resource management. This transition has led to the feminisation of agriculture, where women are no longer limited to supportive tasks but are actively involved in land preparation, sowing, transplanting, weeding, harvesting, post-harvest processing, livestock rearing, and marketing activities. In the hill regions of Uttarakhand, women are increasingly taking responsibility for farm management and agricultural decision-making, contributing substantially to household food security and rural livelihoods. Their knowledge of traditional farming practices, crop diversity, and resource conservation has become vital for maintaining sustainable agricultural systems in fragile mountain environments. At the same time, women farmers continue to face challenges such as limited access to land ownership, modern

technology, extension services, institutional credit, and market opportunities, which constrain their productivity and economic empowerment. Against this background, the present study seeks to understand the changing role of women in agriculture and examine the key factors driving the feminisation of agriculture in Tehri Garhwal district of Uttarakhand. It also aims to assess how these transformations influence sustainable rural livelihoods and agricultural sustainability in different altitudinal zones. By exploring these dimensions, the study contributes to a better understanding of gender dynamics in mountain agriculture and provides insights for developing gender-sensitive policies and livelihood interventions that strengthen the resilience of women farmers in the Western Himalayas.

Study Area

The study was conducted in Tehri Garhwal district, Uttarakhand, located in the Western Himalayan region, where agriculture is predominantly rain-fed and characterised by fragmented landholdings and diverse altitudinal conditions. To capture the spatial variation in women's agricultural roles, three villages representing different altitude zones were selected: Bhattgaon (low altitude), Sajwan Kanda (mid altitude), and Regoli (high altitude). These villages differ in terms of climate, cropping patterns, accessibility, and livelihood opportunities, providing a representative picture of hill agriculture. The varied topography and socio-economic conditions make the study area suitable for examining the drivers and impacts of the feminisation of agriculture and its implications for sustainable rural livelihoods in the Himalayan region.

Methodology

The study employed a cross-sectional field survey to investigate the feminisation of agriculture in the hill region of Tehri Garhwal, Uttarakhand. Three villages representing different altitudinal zones were purposively selected, and 30 women farmers were interviewed using a pre-tested interview schedule. Respondents were chosen through stratified random sampling to ensure representation from each village. Both qualitative and quantitative information on agricultural activities, livelihood patterns, and factors influencing women's participation in farming were collected. The data were analysed using descriptive statistics, including frequency distribution, percentage analysis, and ranking techniques, to identify the key drivers and assess their influence on rural livelihoods. The results were interpreted in the context of the socio-economic and geographical characteristics of the Himalayan region.

Result and Discussion

Driving Forces Behind the Feminisation of Agriculture

Table 1. Major Drivers of Feminisation of Agriculture

S. No.	Major Drivers	Respondents	%	Rank
1	Male out-migration	27	90.0	I
2	Labour shortage	24	80.0	II
3	Declining farm income	22	73.3	III
4	Increased household dependence on women in farming	21	70.0	IV
5	Fragmented landholdings	20	66.7	V
6	Climate variability	19	63.3	VI
7	Increased responsibility in agricultural activities	18	60.0	VII
8	Limited mechanization	17	56.7	VIII
9	Government support programmes (insufficient access/benefits)	12	40.0	IX

Source: Source: Illustrate by Author

The table 01 indicate that male out-migration (90.0%) is the most significant driver of the feminisation of agriculture in Tehri Garhwal. As men migrate to urban areas for employment,

women increasingly assume responsibility for agricultural production and farm management. Labour shortage (80.0%) emerged as the second most important factor, reflecting the scarcity of farm labour in the hill region. Declining farm income (73.3%) has compelled households to depend more heavily on women's labour to sustain agricultural activities and livelihoods. Furthermore, 70.0% of respondents reported that increased household dependence on women has expanded their role in farming. Fragmented landholdings (66.7%) and climate variability (63.3%) further intensify the need for women's active participation in agriculture. More than half of the respondents identified increased responsibility in agricultural activities (60.0%) and limited mechanisation (56.7%) as key contributors, highlighting the labour-intensive nature of hill farming. In contrast, only 40.0% of respondents considered government support programmes to be an important driver, suggesting that existing schemes have had limited influence on shaping women's participation in agriculture. Overall, the findings reveal that demographic, economic, environmental, and institutional factors collectively contribute to the ongoing feminisation of agriculture in the Western Himalayas.

Implications of the Feminisation of Agriculture for Rural Livelihoods

Table 2. Effects of Feminisation of Agriculture on Rural Livelihoods

S. No.	Impact	Respondents	(%)	Rank
1	Increased participation of women in agricultural activities	28	93.3	I
2	Greater role in farm decision-making	24	80.0	II
3	Improved household food security	22	73.3	III
4	Increased workload and time burden	21	70.0	IV
5	Adoption of diversified farming practices	20	66.7	V
6	Enhanced participation in Self-Help Groups (SHGs) and community organisations	18	60.0	VI
7	Limited access to credit, technology and extension services	17	56.7	VII
8	Improved household income through women's contribution	16	53.3	VIII
9	Increased vulnerability due to labour shortage and climate risks	15	50.0	IX

Source: Illustrate by Author

The table 02 indicate that the most significant impact of the feminisation of agriculture is the increased participation of women in agricultural activities, reported by 93.3% of respondents. Women have become the primary workforce in crop cultivation, livestock management, and post-harvest operations due to the migration of men from rural areas. Approximately 80.0% of respondents observed that women now play a greater role in agricultural decision-making, including crop selection, input use, and farm management. Improved household food security (73.3%) was identified as another positive outcome, as women's active involvement has helped sustain agricultural production despite labour shortages. However, 70.0% of respondents reported a considerable increase in women's workload, as they are responsible for both agricultural and domestic activities. Around 66.7% noted that women have adopted diversified farming practices, including horticulture, vegetable cultivation, and livestock rearing, contributing to livelihood resilience. Participation in Self-Help Groups and community organisations (60.0%) has strengthened women's social and economic engagement. Despite these positive developments, 56.7% of respondents highlighted continued constraints in accessing credit, agricultural technology, and extension services. Nearly 53.3% believed that women's increased involvement has contributed to household income, while 50.0% expressed concern about greater vulnerability arising from labour shortages and climate-related risks. Overall, the findings indicate that the feminisation of

agriculture has enhanced women's contribution to agricultural production and rural livelihoods but has not been accompanied by adequate institutional support. Strengthening women's access to productive resources, training, and markets is essential to ensure that feminisation leads to genuine empowerment rather than simply an increase in labour responsibilities.

Conclusion

The study concludes that the feminisation of agriculture has become a defining feature of agricultural transformation in the hill areas of Tehri Garhwal. Driven primarily by male out-migration, labour shortages, declining farm income, and climate variability, women have emerged as the principal contributors to agricultural production and household livelihood management. Their expanding role has strengthened farm continuity, enhanced food security, encouraged crop diversification, and increased participation in farm-related decision-making. However, this transition has also exposed women to greater workloads, limited mechanisation, inadequate access to land ownership, institutional credit, extension services, and market opportunities. These constraints reduce the overall benefits of their increasing participation in agriculture. Therefore, the feminisation of agriculture should be viewed not merely as an increase in women's labour but as a process requiring gender-responsive policies, institutional recognition, and equitable access to productive resources. Strengthening women's capacity through skill development, improved infrastructure, financial inclusion, and climate-resilient agricultural practices will be essential for promoting sustainable rural livelihoods and ensuring long-term agricultural development in the Western Himalayan region.

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