

Jitender Singh, Rajan Bhandari & Nem Raj (2026). Apple-Economy Employment and Livelihood Diversification among Van Gujjars in Shimla District, Himachal Pradesh: Seasonal Opportunities, Income Contributions and Pastoral Continuity. International Journal of Multidisciplinary Research & Reviews, 5(7),412-427.



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APPLE-ECONOMY EMPLOYMENT AND LIVELIHOOD DIVERSIFICATION AMONG VAN GUJJARS IN SHIMLA DISTRICT, HIMACHAL PRADESH: SEASONAL OPPORTUNITIES, INCOME CONTRIBUTIONS AND PASTORAL CONTINUITY

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Keywords	Abstract
Van Gujjar; Apple Economy; Livelihood Diversification; Seasonal Employment; Pastoralism; Household Income; Shimla; Himachal Pradesh.	The expansion of commercial apple cultivation in Himachal Pradesh has generated a seasonal labour market that increasingly intersects with mobile pastoral livelihoods. This study examines how apple-orchard employment contributes to livelihood diversification among Van Gujjar households during their summer stay in Shimla district. An exploratory mixed-methods design combined a household interview schedule with semi-structured interviews, three focus-group discussions and field observation across three Van Gujjar migratory groups at Chanshal, Shiladesh and Larot in the Pabbar Valley. The sample comprised 33 households and 50 individual respondents. Quantitative analysis used descriptive measures of monthly labour income, income shares and an illustrative comparison of two households with similar family size and livestock holdings. Qualitative material was used to reconstruct the timing, forms and perceived drivers of engagement with orchard work. Reported average monthly labour income was highest during the highland stage (₹8,724), where it accounted for



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	25.8% of household income, compared with ₹4,012 and 14.31% during the lowland stage; no labour earnings were recorded during transit. In the illustrative paired comparison, the orchard-engaged household earned approximately 33% more total monthly income than the non-engaged household, while its labour income was about 3.4 times as high. Livestock income remained similar in both cases, indicating complementarity rather than wholesale occupational replacement. Participants associated the growth of engagement with the spatial and seasonal coincidence of migration and orchard operations, as well as growers' need for short-duration labour. However, limited formal skills, seasonal employment, mobility constraints and unequal access to orchard networks restrict the scale and stability of these gains. The findings identify apple employment as a supplementary income pathway whose benefits can be strengthened through portable skills, fair work arrangements and services designed around pastoral mobility.
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1. Introduction

Rural livelihoods in the Himalaya have rarely depended on a single occupation. Agriculture, animal husbandry, forest use, wage labour, trade and seasonal migration are commonly combined in ways that respond to ecological seasonality and changing markets. Livelihood diversification is therefore better understood as the construction of a portfolio of activities and social resources than as a one-way shift out of a traditional occupation (Chambers & Conway, 1992; Ellis, 1998; Scoones, 1998). For mobile pastoral households, this portfolio is strongly shaped by when and where labour, grazing and market opportunities become accessible.

The Van Gujjars are a Muslim pastoral community of the northwestern Himalaya whose livelihood has historically centred on buffalo rearing, milk production and seasonal movement between the Shivalik foothills and high-altitude summer pastures. Ethnographic research describes this mobility as an ecological and economic strategy rather than an absence of settlement or productive organization (Gooch, 1992, 1998, 2004). Some groups move towards the Shimla hills in summer, placing them in proximity to commercial horticultural zones at the same time that orchards require substantial short-term labour (Gooch, 2004). Their mobility nevertheless remains vulnerable to changing forest regulation, restricted routes, land-use conversion and uneven access to citizenship and public services (Gooch, 2009; Srivastava, 2022).

At the same time, Himachal Pradesh has experienced a major transition from subsistence-oriented agriculture towards commercial horticulture. The Government of Himachal Pradesh reports that the area under apple cultivation increased from 400 hectares in 1950-51 to 116,338 hectares in 2024-25; apples accounted for about 49.01% of the area under fruit crops and 77.58% of fruit production in that year (Government of Himachal Pradesh, 2026). The longer expansion of orchard infrastructure, storage, grading and marketing has made apple cultivation a major source of direct and indirect employment in the state (Department of Horticulture, Himachal Pradesh, 2025; World Bank, 2024). Shimla district is the core of this regional economy and contains major apple-growing belts around



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Theog, Kotkhai, Kotgarh, Kumarsain, Chopal and Rohru. Apple cultivation is labour-intensive at specific stages, including orchard cleaning, weeding, harvesting, sorting, grading, packing, carriage and loading. Studies of production costs, marketing and supply-chain management repeatedly identify labour availability, labour cost, transport and post-harvest infrastructure as important constraints for growers (Kireeti et al., 2014; Kireeti & Sharma, 2017; Sharma et al., 2018; Kumar & Parmar, 2026). These seasonal requirements create a potential point of convergence between the apple economy and Van Gujjar mobility. Yet the relationship has received limited direct study. Existing work on Van Gujjars has concentrated mainly on pastoralism, forest rights, mobility, conservation and marginalization, while apple-economy research generally centres on growers, production, profitability, climate risk and marketing.

This paper addresses that gap by examining apple-related wage work as an emerging component of Van Gujjar livelihood portfolios in Shimla district. It asks whether this work adds income without displacing livestock production, which tasks and household conditions shape participation, and what constraints limit its contribution. The paper treats orchard employment neither as automatic “modernization” nor as evidence of the disappearance of pastoralism. Instead, it examines how a mobile community selectively incorporates a seasonal market opportunity into an existing livelihood system.

2. Literature Review and Conceptual Framework

2.1 Van Gujjar pastoralism in transition

Gooch’s long-term ethnographic work remains foundational for understanding Van Gujjar livelihood organization. It documents a specialized pastoral economy based primarily on buffalo milk, temporary forest camps and annual movement across ecological zones (Gooch, 1992, 1998, 2004). This system depends on access to spatially separated grazing resources, migratory routes and exchange relationships with settled populations. It also reveals that mobility is embedded in social identity, knowledge and everyday practice rather than being simply a response to income scarcity.

Later research shows that this system operates under growing pressure. Conservation policies, forest controls, encroachment on grazing areas, road development and administrative boundaries can restrict the flexibility on which transhumance depends (Gooch, 2009; Srivastava, 2022). Field research in the Upper Yamuna Basin similarly reports declining pasture quality, reduced fodder availability and financial stress, and recommends livelihood diversification that is compatible with the community’s migratory cycle (Singh & Bhandari, 2022). These studies support a crucial distinction: diversification can supplement pastoralism and spread risk, but poorly designed interventions may instead accelerate involuntary sedentarization or weaken access to grazing resources.

2.2 Apple horticulture, labour demand and rural change

Apple cultivation has reshaped land use, household earnings, infrastructure and market relations in Himachal Pradesh. Its long-term expansion is well documented, but the sector also faces rising



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production costs, small and fragmented holdings, market volatility and variable public support (Panwar, 2011; Wani & Songara, 2018). Farm-level studies in Shimla and Kullu identify labour as a significant cost and show that growers depend on hired workers for time-sensitive operations (Kireeti et al., 2014; Sharma et al., 2018). Research on supply chains further indicates that contract labour, transport, grading and storage are integral to orchard profitability and product quality (Kumar & Parmar, 2026; Sharma et al., 2024). Comparable work on mountain apple value chains also shows that post-harvest handling and market coordination create employment beyond cultivation itself (Khadka & Solberg, 2020).

The apple economy is also exposed to climatic and spatial change. Studies report shifts in suitable cultivation zones, production variability and the increasing importance of adaptation, orchard management and infrastructure (Sen et al., 2015; Sahu et al., 2020; Yasmin et al., 2023). These pressures can alter the timing, intensity and location of labour demand. They also make a flexible local labour pool potentially valuable, provided workers have access to fair wages, safe working conditions and task-specific skills.

2.3 Analytical framework

The study draws on the sustainable livelihoods and livelihood-diversification approaches. A livelihood comprises capabilities, assets and activities required for a means of living, while diversification refers to the construction of multiple activities and support systems to survive and improve living standards (Chambers & Conway, 1992; Ellis, 1998). Scoones (1998) emphasizes the interaction between livelihood assets, institutions, vulnerability and outcomes. Applied here, livestock, pastoral knowledge, family labour, mobility networks and access to grazing form the existing asset base. Seasonal proximity to apple orchards creates a labour opportunity, but participation is mediated by household composition, labour availability, skills, social contacts, orchard access and the need to continue herd management.

The expected outcome is not necessarily occupational change. Apple-related earnings may provide cash for food, fodder, travel, health care, education, savings or livestock expenses while the core pastoral system continues. The analysis therefore evaluates three linked outcomes: (i) the addition of apple work to the household activity portfolio, (ii) the contribution of labour earnings to monthly household income and (iii) whether livestock income appears to decline among participating households. Because the available evidence is descriptive and based on a small exploratory field study, the framework identifies associations and pathways rather than causal effects.

3. Objectives and Research Questions

3.1. Objectives.

The study was designed to achieve the following objectives:

1. To describe the traditional livelihood structure and seasonal mobility of the selected Van Gujjar groups;



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2. To identify the apple-related tasks and employment opportunities accessible during the highland stage;
3. To compare labour-income contributions across the lowland, transit and highland stages of migration;
4. To assess whether orchard employment supplements or replaces livestock-based income; and
5. To identify the constraints and policy measures relevant to safe and equitable livelihood diversification.

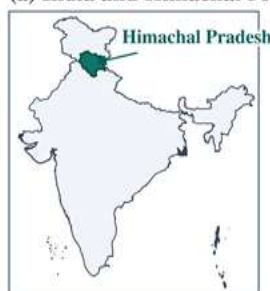
3.2. Research Questions

1. How does the timing and location of the apple season intersect with Van Gujjar migration?
2. Which orchard and post-harvest activities generate employment for Van Gujjar households?
3. What contribution does labour work make to household income at different stages of the transhumance cycle?
4. How does the income composition of an orchard-engaged household differ from that of a comparable non-engaged household?
5. What factors enable or constrain participation in apple-related employment?

4. Study Area and Community Context

Shimla district lies in the middle and higher Himalayan ranges of Himachal Pradesh. Its altitudinal variation, cool temperate climate and established horticultural infrastructure support extensive apple cultivation. The principal apple-growing belts include Theog, Kotkhai, Kotgarh, Kumarsain, Chopal, Jubbal and Rohru. Storage and post-harvest facilities in the district, including controlled-atmosphere stores and grading and packing units, reflect the development of a multi-stage apple value chain (Department of Horticulture, Himachal Pradesh, 2025; Government of Himachal Pradesh, 2026). The selected Van Gujjar groups use the district as part of the summer or highland stage of their annual movement. Fieldwork was conducted at three summer-camp sites in the Pabbar Valley—Chanshal, Shiladesh and Larot.

(a) India and Himachal Pradesh



(b) Himachal Pradesh and Shimla district



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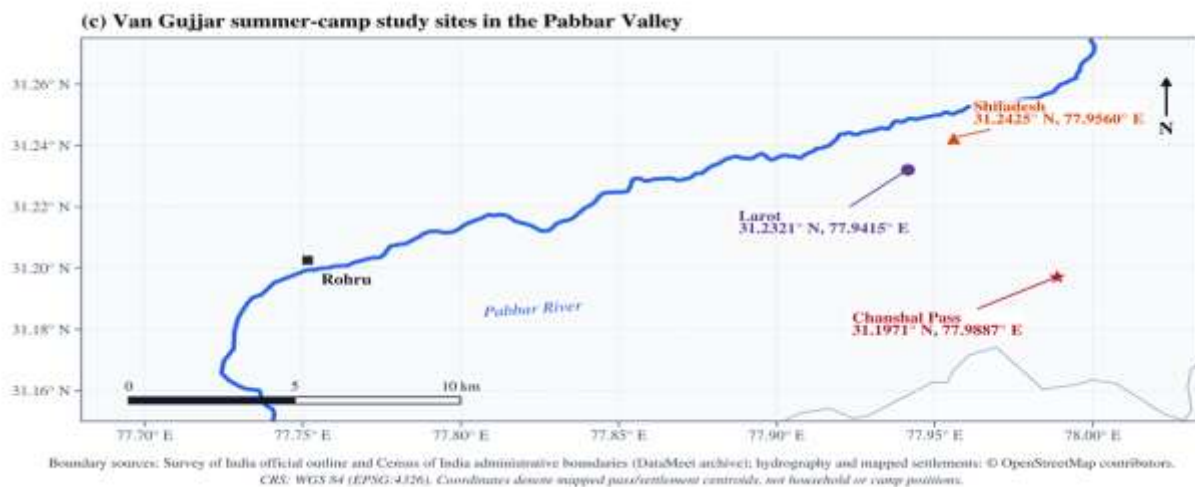


Figure 1. Location of the three Van Gujjar summer-camp study sites in the Pabbar Valley, Shimla district, Himachal Pradesh.

Note. Coordinates are reported in WGS 84 and denote mapped settlement centroids or the mapped pass location, not household positions. Boundary, hydrography and settlement data: © OpenStreetMap contributors (accessed 26 August 2026).

Their transhumance cycle can be understood in three broad stages: winter residence in the doon and Shivalik foothill zone, movement through transit routes across the Shivalik and middle Himalayan zones, and summer residence in middle-Himalayan highlands. Each stage differs in grazing conditions, market access, settlement contact and labour opportunity. This paper focuses on the highland stage because it overlaps spatially and temporally with major orchard operations. The WGS 84 mapped locations of the three study sites are Chanshal (31.1971° N, 77.9887° E), Shiladesh (31.2425° N, 77.9560° E) and Larot (31.2321° N, 77.9415° E) (Figure 1). These coordinates identify the mapped pass or settlement-centroid locations and do not represent individual households or camp structures (GeoNames, n.d.; OpenStreetMap contributors, 2026; Shimla District Administration, n.d.; Wikidata contributors, 2024). Shimla district lies in the middle and higher Himalayan ranges of Himachal Pradesh. Its altitudinal variation, cool temperate climate and established horticultural infrastructure support extensive apple cultivation. The principal apple-growing belts include Theog, Kotkhai, Kotgarh, Kumarsain, Chopal, Jubbal and Rohru. Storage and post-harvest facilities in the district, including controlled-atmosphere stores and grading and packing units, reflect the development of a multi-stage apple value chain (Department of Horticulture, Himachal Pradesh, 2025; Government of Himachal Pradesh, 2026).

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Shivalik and middle Himalayan zones, and summer residence in middle-Himalayan highlands. Each stage differs in grazing conditions, market access, settlement contact and labour opportunity. This paper focuses on the highland stage because it overlaps spatially and temporally with major orchard operations.

5. Materials and Methods

5.1 Research design

The research used an exploratory mixed-methods multiple-case design. Quantitative household data were used to describe income sources, employment and the contribution of labour earnings at different stages of migration. Qualitative interviews, group discussions and field observation were used to interpret livelihood transitions, task allocation, constraints and community perceptions. The mixed design was appropriate because the economic contribution of orchard work must be read alongside the mobility and herd-management practices that structure household decisions.

5.2 Sampling and participants

Three Van Gujjar migratory groups using summer pastures in Shimla district were selected purposively, with one group associated with each study site at Chanshal, Shiladesh and Larot. The group was the field-entry unit, while the household was the principal unit for income and employment analysis. The sampling frame comprised 33 surveyed households and 50 individual respondents. Three focus-group discussions were conducted—one at each study site—with 10 participants in each discussion. Households and key participants were approached during the highland stage on the basis of their presence, knowledge of the transhumance cycle and willingness to participate. The exploratory sampling strategy supports analytical insight into the selected groups but does not permit statistical generalization to all Van Gujjars in Himachal Pradesh.

5.3 Data collection

A structured household interview schedule recorded livestock holdings, household composition, livelihood activities, monthly income by source, days and type of wage work, apple-related tasks and constraints. The schedule covered two linked domains: first, Van Gujjar life, culture, environmental interaction and challenges; and second, the changing household economy across the lowland, transit and highland stages, with specific attention to apple-related employment during the highland stage. Semi-structured interviews and group discussions explored when engagement began, how workers obtained orchard work, which household members participated, how herd care was reorganized and how the additional income was used. Direct observation was used to record camp context, proximity to orchards and the nature of work performed. Primary data were collected from three sampled summer camps—Chanshal, Shiladesh and Larot. The field work was conducted from May–September, 2023 in Hindi language and the study included 50 individual respondents. In addition, three focus-group discussions were conducted, with 10 participants in each group.



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5.4 Measures and analysis

Income was recorded as approximate monthly household earnings in Indian rupees by source and migration stage. Labour-income share was calculated as labour income divided by total household income and multiplied by 100. Descriptive comparisons were made across the three stages of migration. An illustrative matched comparison was also prepared for two five-member households, each keeping 7-10 livestock: one household participated in apple-orchard work and the other did not. Midpoints of reported income ranges were used to describe the approximate income difference and labour-income ratio. These calculations are descriptive and should not be interpreted as causal impact estimates.

Qualitative responses were organized thematically around the onset of orchard employment, task profiles, labour recruitment, seasonality, wage differences, compatibility with livestock care and barriers to participation. Quantitative and qualitative findings were then integrated in the discussion to distinguish observed income contributions from participant explanations of why engagement had changed.

5.5 Research ethics and positionality

Research with a mobile and historically marginalized community requires particular attention to voluntary participation, confidentiality, culturally appropriate interaction and the avoidance of extractive representation. No identifying household names are reported in the manuscript. Claims based on participant narratives are presented as reported perceptions rather than as independently verified labour-market trends. Reports of work by adolescents require separate ethical and legal consideration and are not treated here as a recommended livelihood pathway.

6. Results

6.1 Expansion of the apple economy and seasonal labour demand

Apple cultivation has expanded from a small planted area in the early post-Independence period to the dominant component of Himachal Pradesh's fruit economy. Official statistics report 116,338 hectares under apple in 2024-25 and continued investment in market yards, controlled-atmosphere storage, grading, packing and processing (Department of Horticulture, Himachal Pradesh, 2025; Government of Himachal Pradesh, 2026). This infrastructure indicates that labour demand extends beyond cultivation to harvesting, packing, carriage, loading and handling. Grower studies likewise identify hired and contract labour as essential for completing time-sensitive operations (Kireeti & Sharma, 2017; Kumar & Parmar, 2026).

Participants described very limited interaction between the apple industry and their community before the early 2000s. A small number of households camped near orchards then began to accept daily-wage work. Respondents reported that engagement became more visible after the COVID-19 disruption, when some growers experienced difficulty securing their usual seasonal workforce. This account should be understood as a field-based explanation from the selected sites; the study did not



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independently measure interstate or international migration by Nepali workers. The evidence indicates that Van Gujjar workers supplement the orchard labour pool locally rather than demonstrate a wholesale replacement of Nepali labour.

6.2 Forms of apple-related employment

The main activities reported were orchard cleaning and weeding, harvesting, carriage of filled boxes, loading, guarding fruit against birds and wild animals, and basic post-harvest handling. Tasks requiring specialized knowledge or equipment-such as pruning, grafting, plant-protection decisions, grading to market specifications and machinery operation-were less accessible. Participation therefore remained concentrated in manual and short-duration work. This pattern is consistent with the broader structure of mountain apple value chains, in which harvesting and logistics create a sharp seasonal demand for labour (Khadka & Solberg, 2020; Kumar & Parmar, 2026).

Household labour availability influenced participation. During the highland stage, open grazing conditions could allow one adult to supervise livestock while other adults accepted orchard work. Larger households therefore had greater capacity to combine herd care and wage employment. Respondents reported that an adult male worker commonly earned approximately ₹8,000-₹10,000 per month from orchard labour. The original field schedule grouped adult women and adolescents together in a ₹6,000-₹8,000 range; because those categories were not disaggregated, that figure is not used as an adult wage estimate here. Future research should record age, gender, task, hours and wage separately.

6.3 Labour income across the transhumance cycle

Labour earnings varied substantially by migration stage. The highland stage produced both the largest average monthly labour income and the largest labour share of household income. The transit stage generated no recorded labour income because movement and herd management occupied household labour, while employment access was temporary and uncertain.

Table 1. Average monthly household labour income by stage of the transhumance cycle

Migration stage	Typical location/context	Average labour income (₹/month)	Share of total household income (%)
Lowland/winter	Doon and Shivalik foothills; non-orchard labour	4,012	14.31
Transit	Movement between seasonal habitats	0	0.00
Highland/summer	Shimla highlands; proximity to apple orchards	8,724	25.80

Note. Author's field survey. Income values are approximate and recall-based. The lowland figure refers to labour work generally, whereas the highland figure includes apple-related work.



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Average labour income in the highlands was ₹4,712 per month higher than in the lowlands and more than twice the lowland value. Its share of total household income rose by 11.49 percentage points, from 14.31% to 25.8%. These figures demonstrate the seasonal importance of the highland labour market, but they do not show that all highland income came from apples or that every household participated equally.

6.4 Illustrative household comparison

To clarify the potential magnitude of apple-related income, two five-member households with similar livestock holdings (7-10 animals) were compared. Household A undertook apple-orchard labour, whereas Household B did not. Both reported the same livestock-income range, but their labour earnings differed substantially.

Table 2. Illustrative monthly income comparison of two similar Van Gujjar households at the highland stage

Income source	Household A: orchard-engaged range (₹)	Household A midpoint (₹)	Household B: non-engaged range (₹)	Household B midpoint (₹)
Livestock income	30,000-33,000	31,500	30,000-33,000	31,500
Labour income	16,000-18,000	17,000	4,000-6,000	5,000
Total income	46,000-51,000	48,500	34,000-39,000	36,500

Note. Author's field survey. Households each had five members and 7-10 livestock. Midpoints are calculated from reported ranges. This paired illustration is descriptive and not a population estimate.

Using range midpoints, Household A earned approximately ₹48,500 per month, compared with ₹36,500 for Household B—a difference of ₹12,000 or 32.9%. Labour income was ₹17,000 versus ₹5,000, making it 3.4 times as high, equivalent to an increase of about 240%. Because livestock income remained identical at the midpoint, the difference was associated with added labour earnings rather than a reduction in livestock activity.

Table 3. Approximate income composition of the illustrative households at the highland stage

Household	Livestock income (%)	Labour income (%)
Household A: orchard-engaged	65	35
Household B: non-engaged	86	14

Note. Author's field survey; shares are approximate and based on reported income ranges/midpoints.

The composition comparison reinforces the interpretation of diversification. Labour accounted for approximately 35% of Household A's highland income but only 14% of Household B's. Livestock



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nevertheless remained the largest income source for both households. Orchard work therefore broadened the income portfolio without becoming the dominant livelihood base in this illustration.

6.5 Constraints on participation and income enhancement

Participation was constrained by limited task-specific skills, low literacy, the short duration of orchard work, uncertainty of recruitment, household labour requirements and distance between camps and orchards. Workers with no pruning, grading or machinery skills were concentrated in lower-skill manual operations. Mobility also limited continuity: households could not remain in the orchard belt outside the highland stage without disrupting the transhumance cycle. Women's participation was shaped by simultaneous responsibilities for children, food preparation, camp management and animals, although the present data do not permit a gender-disaggregated estimate.

Respondents also perceived a wage differential between Van Gujjar and established migrant workers. They associated their acceptance of lower wages with the supplementary character of orchard work, while labour was described as the principal income source for many Nepali workers. This explanation is plausible but requires systematic wage data controlling for task, skill, hours, food, accommodation and payment method. Without such data, lower wages should not be interpreted as an economic advantage; they may also indicate unequal bargaining power.

7. Discussion

7.1 Diversification through seasonal complementarity

The central finding is that apple-related employment fits the seasonal geography of Van Gujjar livelihoods. It becomes accessible when households are in the highlands and orchard demand is concentrated, while livestock remains viable because grazing conditions allow herd supervision to be shared. This is a case of livelihood diversification through temporal and spatial complementarity. It supports Ellis's (1998) argument that rural households assemble portfolios rather than move cleanly from one sector to another, and it aligns with Scoones's (1998) emphasis on the way assets and institutions shape available strategies.

The evidence does not support the claim that apple labour is replacing pastoralism. Livestock supplied most income in both illustrative households, and livestock earnings did not fall for the orchard-engaged household. Apple work instead added cash income during a specific stage of migration. This distinction matters because Van Gujjar identity, food security and mobility remain closely connected to buffalo husbandry and forest-pasture access (Gooch, 1998, 2004). Policies that treat wage employment as a substitute for pastoral rights would misread the observed relationship.

7.2 A localized labour-market adjustment

Growers' reliance on seasonal hired labour is well established in the apple literature (Kireeti & Sharma, 2017; Sharma et al., 2018; Kumar & Parmar, 2026). The selected Van Gujjar groups appear to have entered this market gradually through proximity and personal recruitment. Participants' accounts of faster engagement after the pandemic suggest a localized labour-market adjustment, but



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the study cannot verify the broader claim that Nepali workers permanently shifted to Gulf or Southeast Asian destinations. The cautious conclusion is that Van Gujjar workers have become an additional labour source in some sites where growers faced seasonal recruitment pressure.

This adjustment can benefit both workers and growers, but the distribution of gains requires scrutiny. Short-term labour may help growers complete harvesting and carriage on time, while workers receive cash that is otherwise scarce during migration. Yet informal recruitment, wage differentials and limited task mobility can reproduce vulnerability. Training is valuable only if it expands choice, pay and safety rather than simply making a low-cost labour pool more efficient.

7.3 Income security, resilience and risk

The rise in highland labour income indicates a meaningful supplementary contribution. In the illustrative comparison, total household income was about one-third higher among the orchard-engaged household. Diversification can reduce dependence on milk prices, fodder conditions or a single ecological resource, thereby strengthening short-term resilience. Cash income may also help finance migration and livestock costs. However, apple work is itself seasonal and exposed to crop variability, climate shifts and market conditions (Sen et al., 2015; Sahu et al., 2020; Yasmin et al., 2023). It should therefore be treated as one component of resilience, not a guaranteed safety net.

Access is also unequal. Households with more working-age adults can allocate one person to herd supervision and others to wage work, whereas smaller, elderly or care-burdened households may not be able to participate. This creates a potential divergence within the community: the households most in need of supplementary income may possess the least spare labour. Future analysis should therefore distinguish participation and earnings by household size, dependency ratio, gender, age, herd size, camp location and pre-existing relationships with orchard owners.

8. Policy Implications

The findings support an enabling approach that protects pastoral continuity while improving the terms on which households enter seasonal employment. First, horticulture and rural-livelihood agencies could provide short, portable training modules near summer camps in harvesting, safe ladder use, sorting, grading, packing and basic post-harvest handling. Certification should be simple and valid across locations so that mobility does not prevent workers from demonstrating skills. Second, local facilitation through Panchayats, horticulture extension services, orchard associations and trusted community representatives could improve job information, transparent task-based wages and payment reliability. Basic records of worker, task, days, rate and payment would reduce disputes without requiring permanent settlement. Occupational safety provisions should include appropriate equipment, drinking water, rest periods, first-aid access and safe transport of loads.

Third, livelihood programmes should not be conditional on abandoning migration or livestock. Mobile veterinary services, access to fodder and water, protection of migratory routes, seasonal education and identity-document portability remain essential to the pastoral economy (Gooch, 2009;



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Srivastava, 2022). Apple employment should supplement these rights and services rather than compensate for their erosion. Fourth, monitoring should be disaggregated by age and gender. Adult women may benefit from accessible post-harvest tasks and direct payment, but programmes must account for care responsibilities and safety. Any participation by children or young adolescents must be handled in accordance with applicable law and the priority of education; the present findings should not be used to normalize child labour.

9. Limitations and Directions for Further Research

The study is exploratory and covers 33 households across three purposively selected groups. The absence of a probability sample limits statistical generalization. Income values are self-reported, approximate and monthly; they may be affected by recall error and seasonal variation. The illustrative two-household comparison controls only broadly for family size and livestock holdings and cannot establish causal impact. The analysis also lacks systematic data on days worked, hours, task-specific wages, in-kind payments, expenditure, gender, age, education and distance to orchards. Further research should use a larger panel of households observed across the lowland, transit and highland stages. A comparison of participants and non-participants matched on household composition, herd size, camp location and prior income would improve attribution. Wage data should distinguish task, skill, gender, age and payment arrangement. Interviews with orchard owners, labour contractors, Panchayats and horticulture officials would help test participant accounts of labour substitution and recruitment after COVID-19. Longitudinal work is also needed to determine whether apple employment strengthens pastoral resilience or gradually changes herd size, migration routes and aspirations.

10. Conclusion

The apple economy of Shimla district has created a seasonal employment niche that some Van Gujjar households are incorporating into their livelihood portfolios. The opportunity is enabled by a close match between the summer migration stage and orchard operations such as weeding, harvesting, carriage and loading. Reported average labour income and its share of household income were substantially higher in the highlands than in the lowlands, and the illustrative household comparison showed a roughly one-third total-income advantage associated with orchard participation.

The evidence nevertheless points to supplementation, not replacement. Livestock remained the main income source and did not decline in the orchard-engaged case. Apple work can therefore provide useful cash income while pastoralism continues, but its benefits are limited by seasonality, skill gaps, household labour constraints, informal recruitment and possible wage inequality. The most appropriate policy response is to improve skills, safety, wage transparency and portable services while protecting the grazing access, mobility and livestock systems on which Van Gujjar livelihoods remain based.



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