Determinants of Adoption and Performance of Agri-Allied Enterprises in Himachal Pradesh: An Integrated Analysis of Food Processing, Agri-Entrepreneurship and Agro-Tourism

ANTORIK GOSWAMI, MOHIT YADAV, TARJAN SINGH THAKUR, DINESH KUMAR, DR. RAHUL DHIMAN*

Abstract: *Purpose: Agriculture in Himachal Pradesh supports more than half of the state's workforce but contributes less than a sixth of its gross state value added, and almost nine in ten holdings are small or marginal. Agri-allied enterprises—food processing, farm-based entrepreneurship and agro-tourism—are widely promoted as routes to higher and more stable farm incomes in this mountain state. This paper reviews what is known about why households adopt these enterprises and what determines how well the enterprises perform, and integrates the three strands into a single analytical framework.*

Design/methodology/approach: The study combines an integrative review of peer-reviewed literature on adoption, diversification, agri-entrepreneurship, value addition and agritourism with an analysis of secondary data from the Economic Survey of Himachal Pradesh 2024-25, parliamentary answers of the Ministries of Food Processing Industries, MSME, Agriculture and Tourism, and state department records.

Findings: Secondary data show rapid but uneven growth: 1,767 micro food-processing loans sanctioned under PMFME (2021-22 to January 2025), 44 PMKSY food-processing projects, 3,974 PMEGP units (2021-22 to 2024-25), 124 NABARD-promoted FPOs with 26,332 members, and about 4,289 registered homestays against 246 in 2010. The literature identifies five clusters of determinants common to all three enterprises: human capital (education, training, experience), resource endowments (land, capital, credit), institutional support (extension, collectives, schemes), market and infrastructure access, and socio-cultural factors (gender roles, risk orientation, community norms). Performance depends further on scale and capacity use, value-chain linkages, collective organisation and access to working capital. Enterprise-specific constraints include seasonality and raw-material dependence in processing, and regulatory and socio-cultural barriers in homestays.

Originality/value: The paper offers the first integrated framework linking food processing, agri-entrepreneurship and agro-tourism in the Himachal context, sets out testable propositions on adoption and performance, and outlines a research design for primary validation.

Keywords: Agri-Allied Enterprises; Food Processing; Agri-Entrepreneurship; Agro-Tourism; Homestay; Adoption; Enterprise Performance; Himachal Pradesh

Antorik Goswami (goswamiantorik@gmail.com) PhD Scholar,Department of Agribusiness Management, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh (ORCID ID - https://orcid.org/0000-0001-6847-8498)
Mohit Yadav (mohityadav.iabm@gmail.com) PhD Scholar, Department of Agribusiness Management, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh (ORCID iD - https://orcid.org/0009-0006-3199-6260)
Tarjan Singh Thakur (thakurtarjan@gmail.com) *PhD Scholar, Department of Agribusiness Management, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh (ORCID iD - https://orcid.org/0009-0007-3262-2137)
Dinesh Kumar (dks49907@gmail.com) PhD Scholar, Department of Agribusiness Management, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh (ORCID iD - https://orcid.org/0009-0007-3035-3527)
Dr. Rahul Dhiman (rahuldhiman9@gmail.com) Assistant Professor, Department of Agribusiness Management, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh (ORCID iD - https://orcid.org/0000-0002-0521-3342)
*Corresponding Author: Tarjan Singh Thakur, Email ID: thakurtarjan@gmail.com

Introduction

Himachal Pradesh is a mountain state in which agriculture remains the principal source of livelihood but a declining source of output. In FY2024-25, agriculture and allied activities contributed about 14.70 per cent of the state's gross state value added (GSVA), a share that has remained between 13 and 15 per cent over the preceding five years, while the sector provided direct employment to about 53.95 per cent of the state's workers (Government of Himachal Pradesh [GoHP], 2025). Holdings are small and fragmented: 88.85 per cent of the 9.97 lakh operational holdings are small or marginal, and the average holding is about 0.95 hectare (GoHP, 2025). The gap between the workforce that depends on agriculture and the value the sector produces means that farm households cannot raise their incomes through crop production alone.

The state has already diversified towards high-value agriculture. Commercial crops accounted for 58.25 per cent of crop production in FY2024-25 (GoHP, 2025), and apple, the most important fruit, now occupies about 1.16 lakh hectares (World Bank, 2024). Crop diversification in the state has been driven by roads, institutions, price support and market access (Sharma, 2011). Diversification within crop production, however, leaves households exposed to weather and price shocks, as the year-to-year volatility of apple output shows (Ministry of Agriculture and Farmers Welfare, 2013; The Tribune, 2024a). A second stage of diversification—into enterprises that add value to farm output or sell rural experiences—is therefore receiving policy attention.

Three such agri-allied enterprises are central to this second stage. Food processing converts perishable fruit, vegetables and other produce into products with longer shelf life and higher unit value. Agri-entrepreneurship covers a broader set of farm-based ventures—input and service businesses, nurseries, protected cultivation, natural-farming produce, collective marketing through farmer producer organisations (FPOs) and agri-startups. Agro-tourism, including farm stays and rural homestays, sells accommodation, food and the experience of farm life to visitors. The three overlap: a homestay may sell its own jams, an FPO may run a processing unit, and a processing unit is itself an entrepreneurial venture.

Research on these enterprises has, however, developed in separate strands. Studies of food processing focus on value chains and financial viability (Sharma et al., 2010; Ali, 2016); studies of agri-entrepreneurship focus on the entrepreneurial behaviour of farmers (Yadav et al., 2014; Afroz et al., 2022); and studies of agritourism focus on motivations and perceived benefits of providers (Nickerson et al., 2001; Tew & Barbieri, 2012). Few studies ask whether the same factors determine adoption and performance across all three, or how the enterprises reinforce one another in a mountain economy.

This paper addresses that gap. Its objectives are:

1. To describe the current status of food processing, agri-entrepreneurship and agro-tourism in Himachal Pradesh using secondary data.
2. To synthesise the evidence on the determinants of adoption of these enterprises by farm households.
3. To synthesise the evidence on the determinants of their performance.
4. To develop an integrated conceptual framework with testable propositions for future empirical research and policy.

Theoretical Background

2.1 Adoption as diffusion and planned behaviour

The adoption of a new enterprise by a farm household can be treated as the adoption of an innovation. Diffusion of innovations theory explains adoption through the perceived attributes of the innovation (relative advantage, compatibility, complexity, trialability and observability), the communication channels through which it spreads and the characteristics of adopters (Rogers, 2003). The agricultural adoption literature adds the economic conditions of the household—farm size, risk, human capital, labour, credit and tenure—as determinants of whether, and how intensively, an innovation is adopted (Feder et al., 1985; Knowler & Bradshaw, 2007). At the individual level, the theory of planned behaviour explains intention to act through attitude, subjective norms and perceived behavioural control (Ajzen, 1991). Together these perspectives suggest that adoption of an agri-allied

enterprise depends on what the household thinks the enterprise will deliver, whether it believes it can run it, and whether its community and institutions support it.

2.2 Sustainable livelihoods and diversification

The sustainable livelihoods framework views households as combining natural, economic, human and social capital in strategies such as intensification, diversification and migration, mediated by institutions and organisations (Scoones, 1998; Department for International Development [DFID], 1999). Agri-allied enterprises are a diversification strategy in this sense. Farm diversification research shows that farmers diversify mainly to raise income, keep the farm in the family and improve their quality of life, and that their goals group into risk reduction, market growth, finances, personal interests, revenue enhancement and family ties (Barbieri & Mahoney, 2009; see also Ilbery, 1991).

2.3 Entrepreneurship and resources

Entrepreneurship theory, from Schumpeter's (1934) account of new combinations, frames the farmer who starts a processing unit or a farm stay as an entrepreneur rather than only a producer. Research on farmers as entrepreneurs notes that farmers are heterogeneous, that the evidence on their entrepreneurial skills is thin and concentrated on diversification, and that a complex regulatory environment constrains them (McElwee, 2006; Alsos et al., 2011). The resource-based view explains performance through resources that are valuable, rare and hard to imitate (Barney, 1991). For mountain enterprises such resources include location-specific produce (temperate fruit), landscapes, culture and traditional knowledge.

2.4 Agritourism

Agritourism is defined in different ways; Phillip et al. (2010) propose a typology based on whether the farm is working, the nature of contact with agricultural activity and whether that contact is authentic. Agritourism providers are motivated mainly by economic goals (Nickerson et al., 2001) but also value attracting new customers, educating the public and improving family quality of life (Tew & Barbieri, 2012). Compared with other farm ventures, agritourism has been found to deliver broader environmental, sociocultural and economic benefits (Barbieri, 2013; see also Sznajder et al., 2009).

Methodology

3.1 Research design

The study is an integrative review supported by descriptive analysis of secondary data. An integrative review allows empirical studies with different designs to be combined with theory and official data to build a conceptual framework, which suits a topic in which evidence is spread across three separate literatures.

3.2 Literature search and selection

Literature was identified through Google Scholar, AgEcon Search, ICAR ePubs, RePEc/IDEAS and publisher databases using combinations of the terms "adoption", "determinants", "performance", "diversification", "value addition", "food processing", "agri-entrepreneurship", "agripreneurship", "farmer producer organisation", "agritourism", "rural tourism", "homestay" and "Himachal Pradesh". Studies were included if they (a) examined the determinants of adoption, participation or performance of one of the three enterprise types or of high-value diversification, (b) were published in peer-reviewed journals, edited books or recognised institutional series, and (c) reported their method. Priority was given to studies from India and from the Indian Himalaya. Bibliographic details of every source were verified against the publisher's record or an indexing database.

3.3 Secondary data

Secondary data were taken from the Economic Survey of Himachal Pradesh 2024-25 (GoHP, 2025); answers given in the Lok Sabha by the Ministries of Food Processing Industries, Micro, Small and Medium Enterprises, Agriculture and Farmers Welfare, and Tourism; the Department of Agriculture, Himachal Pradesh; the annual report of the Him Palam Rural Agri-Business Incubator; World Bank project documentation; and, where official

data were not available, press reports citing state departments. The reference period is mainly 2021-22 to 2024-25. Data are presented as reported, and simple totals and growth rates were computed.

3.4 Synthesis

Determinants reported in the studies were coded into factor clusters, compared across the three enterprise types and used to develop the integrated framework and propositions in Section 7.

Status of Agri-Allied Enterprises in Himachal Pradesh

4.1 Agrarian structure

Table 1 summarises the structural conditions in which agri-allied enterprises operate. The combination of high dependence on agriculture, small holdings and a high share of commercial crops defines both the need for and the raw-material base of agri-allied enterprises.

Table 1: Agrarian structure of Himachal Pradesh

Indicator	Value	Year	Source
Share of agriculture and allied in GSVA	14.70%	2024-25	GoHP (2025)
Agriculture and allied GSVA (current prices)	₹31,879 crore (₹20,838 crore in 2020-21)	2024-25	GoHP (2025)
Workers directly employed in agriculture	53.95%	2024-25	GoHP (2025)
Operational holdings	9.97 lakh; 9.44 lakh ha	2015-16	GoHP (2025)
Small and marginal holdings	88.85% of holdings	2015-16	GoHP (2025)
Average size of holding	0.95 ha	2015-16	GoHP (2025)
Commercial crops in total crop production	58.25%	2024-25	GoHP (2025)
Area under apple	1,15,680 ha	2023	World Bank (2024)
Apple boxes marketed / traded in APMC markets	2.09 crore / 1.17 crore	2024 season	GoHP (2025)

Apple production is highly variable. Official estimates show 8.92 lakh tonnes in 2010-11 and 2.75 lakh tonnes in 2011-12 (Ministry of Agriculture and Farmers Welfare, 2013); output was about 5.06 lakh tonnes in 2023 (The Tribune, 2024a). This volatility is directly relevant to food processing, whose raw-material supply and capacity use depend on the size of the crop, and it strengthens the case for diversification beyond fresh fruit.

4.2 Food processing

Food processing in the state is dominated by micro and small units, with a small organised segment. The Annual Survey of Industries recorded 166 registered food and beverage manufacturing units in Himachal Pradesh in 2021-22 (Ministry of Food Processing Industries [MoFPI], 2024a). Table 2 shows the main scheme indicators.

Table 2: Food processing indicators, Himachal Pradesh

Indicator	Value	Source
PMFME loans sanctioned: 2021-22 / 2022-23 / 2023-24 / 2024-25	156 / 603 / 550 / 458	MoFPI (2025a)
PMFME loans sanctioned, total (to 31.01.2025)	1,767	MoFPI (2025a)

Indicator	Value	Source
PMFME central funds released (to 31.10.2024)	₹70.51 crore	MoFPI (2024b)
PMKSY projects approved (to June 2025)	44	MoFPI (2025b)
PMKSY project cost / grant-in-aid	₹730.06 crore / ₹298.45 crore	MoFPI (2025b)
PMKSY projects by district	Solan 14, Una 10, Shimla 8, Bilaspur 4, Kangra 4, Kullu 2, Sirmaur 2	MoFPI (2025b)
Registered food and beverage units (ASI)	166 (2021-22)	MoFPI (2024a)
HPMC apple juice concentrate produced	1,545 MT (2024 season)	The Tribune (2024b)

Three features stand out. First, PMFME has reached a meaningful number of micro-enterprises in a short period, but annual sanctions peaked in 2022-23 and have since declined. Second, larger PMKSY projects are concentrated in the lower-hill and border districts of Solan and Una, which have better road connectivity and proximity to markets in the plains, while interior districts have few or none. Third, the public sector remains important in fruit processing: HPMC raised its crushing capacity from 21,000 MT to 39,000 MT and processed about 92 per cent of the apples procured under the Market Intervention Scheme in 2024 (The Tribune, 2024b). This dependence on culled fruit procured under a support scheme ties processing volumes to apple prices and to the size of the crop.

4.3 Agri-entrepreneurship and collective enterprises

Table 3 brings together indicators of entrepreneurial activity in and around agriculture.

Table 3: Agri-entrepreneurship and collective enterprise indicators, Himachal Pradesh

Indicator	Value	Source
PMEGP units assisted: 2021-22 / 2022-23 / 2023-24 / 2024-25	1,274 / 930 / 974 / 796 (total 3,974)	Ministry of Micro, Small and Medium Enterprises (2025)
PMEGP margin money, 2021-22 to 2024-25	₹132.81 crore	Ministry of Micro, Small and Medium Enterprises (2025)
PMEGP estimated employment, 2021-22 to 2024-25	31,792	Ministry of Micro, Small and Medium Enterprises (2025)
FPOs registered under the 10,000 FPO scheme (to 31.10.2023)	116	Ministry of Agriculture and Farmers Welfare (2023)
FPOs promoted with NABARD grant	124 FPOs; 26,332 farmer members	GoHP (2025)
FPOs on e-NAM	123	GoHP (2025)
Farmers practising natural farming	2,19,383 farmers; 37,599 ha	GoHP (2025)
HP Horticulture Development Project	30 FPCs, >12,400 members (27% women); >80 agri-entrepreneurs with 30-35% matching grants	World Bank (2024)
Him Palam R-ABI, CSK HPKV (2019-20 to 2022-23)	279 applications; 35 start-ups selected	CSK HPKV (2023)

PMEGP assistance, which includes agro-based units, has fallen in each year after 2021-22. Collective enterprises have expanded through FPOs, and the state's natural-farming programme has created a pool of more than two lakh farmers producing chemical-free produce—a potential raw-material base for niche processed products and a selling point for farm tourism. Incubation is emerging but small: the Him Palam incubator selected 35 start-ups

from 279 applications over four years (CSK HPKV, 2023), and an agri-incubation-cum-food-processing centre was opened at Dr Y.S. Parmar University of Horticulture and Forestry, Nauni, in 2024 (Krishi Jagran, 2024).

4.4 Agro-tourism and homestays

Tourism provides a large and growing market for rural experiences. Himachal Pradesh received about 1.60 crore tourists in 2023, including 62,806 foreign tourists, compared with 1.51 crore including 29,333 foreigners in 2022 (Ministry of Tourism, 2024; Press Trust of India, 2024). The Himachal Pradesh Home Stay Scheme, which allows owner-resident rural households to let a small number of rooms with tax relief and domestic utility tariffs, had 246 registered units in 2010 (Business Standard, 2010). By 2024, about 4,289 homestays with 17,222 rooms were registered with the state Tourism Department, led by Kullu (1,040), Shimla (805), Lahaul-Spiti (718) and Kangra (431) (The Tribune, 2024c). The Home Stay Rules notified in 2025 limit units to six rooms and introduce grading (TeamLease RegTech, 2025).

Table 4: Agro-tourism indicators, Himachal Pradesh

Indicator	Value	Source
Tourist arrivals	1.51 crore (2022); 1.60 crore (2023)	Press Trust of India (2024)
Foreign tourist visits	29,333 (2022); 62,806 (2023, provisional)	Ministry of Tourism (2024)
Registered homestays (2010)	246 units	Business Standard (2010)
Registered homestays (2024)	4,289 units; 17,222 rooms; 26,727 beds	The Tribune (2024c)
Leading districts (homestays)	Kullu 1,040; Shimla 805; Lahaul-Spiti 718; Kangra 431	The Tribune (2024c)
Rural homestays on national NIDHI portal	68	Ministry of Tourism (2025)

The homestay sector has grown about seventeen-fold since 2010, but the gap between state registrations and the national NIDHI registry (68 units) shows that official data on rural tourism are incomplete. Homestays are also not the same as agro-tourism: many offer accommodation without any farm activity. The state has no dedicated agritourism policy; the Tourism Policy 2019 refers to agro-organic tourism among its focus areas (The Tribune, 2019).

Determinants of Adoption

The studies reviewed point to five clusters of factors that influence whether a farm household adopts an agri-allied enterprise. Table 5 summarises the evidence.

5.1 Human capital

Education, training and experience are the most consistently reported determinants. In Mandi district, formal education, enterprise experience, use of information sources and scientific orientation explained the entrepreneurial behaviour of farm women in vegetable farming, with 92 per cent of respondents scoring low to medium (Yadav et al., 2014). Among farm youth in Odisha, income, agripreneurial training, social-media exposure and prior experience determined agripreneurial skill levels (Ray et al., 2021). Education, formal credit and training increased farmers' participation in FPOs (Veesam & Nikam, 2024), and education and capacity building were associated with adoption of improved practices more generally (Mariano et al., 2012). For processing, experience and record keeping increased value addition among cassava farmers in Nigeria (Donkor et al., 2018). For agritourism, the main constraints reported among agrotourism centres in Maharashtra were lack of training, weak communication skills and low entrepreneurial culture (Havale et al., 2022). Human capital therefore

matters across all three enterprises, but the specific skills differ: technical and food-safety skills for processing, management and market skills for agri-entrepreneurship, and hospitality and communication skills for tourism.

5.2 Resource endowments and finance

Land, labour and capital shape both the feasibility and the type of enterprise. At household level in Himachal Pradesh, landholding size, irrigation and family labour were positively associated with crop diversification, while non-farm income was negatively associated (Sharma, 2011). Across India, smallholders with surplus family labour are more likely to diversify into high-value crops, while fruit cultivation, being capital-intensive, depends more on credit (Birthal et al., 2013). Access to credit increased value addition (Donkor et al., 2018) and FPO participation (Veesam & Nikam, 2024). For homestays, the key resource is a house with spare rooms in an accessible, attractive location, which explains the concentration of homestays in Kullu, Shimla and Lahaul-Spiti.

5.3 Institutional support

Extension contact, membership of groups and access to schemes repeatedly increase adoption. Association membership and extension contact increased value addition (Donkor et al., 2018); extension was the strongest influence on adoption of modern rice technology (Mariano et al., 2012); and institutions such as HPMC, the state agricultural universities and price support were central to diversification in Himachal Pradesh (Sharma, 2011). The scheme data in Section 4 show the scale of institutional support, but also its uneven reach: PMKSY projects are concentrated in a few districts, and PMFME and PMEGP sanctions have declined since their peaks.

5.4 Market access and infrastructure

Roads and markets were the main drivers of high-value diversification in Himachal Pradesh (Sharma, 2011) and in South Asia more broadly (Joshi et al., 2003). Linkages with processors raised farmers' incomes by about 49 per cent in Tamil Nadu, mainly because they offered an assured market and prompt payment (Venkatesh et al., 2017). Smallholder dairy producers were not excluded from cooperatives but were excluded from modern private value chains (Sharma, 2015), suggesting that collective organisation can offset small scale. For tourism, road access and distance from established tourist circuits determine demand.

5.5 Socio-cultural and psychological factors

Attitudes, risk orientation, norms and gender roles shape adoption beyond economic factors, as the theory of planned behaviour predicts (Ajzen, 1991). The clearest evidence from Himachal Pradesh concerns homestays. In 15 villages of Kullu, non-participation in the Home Stay Scheme was a rational choice explained by socio-cultural, practical and apprehension-based reasons, including guidelines that were hard to meet, poor sanitation and gender roles (Sood et al., 2017). Economic motives dominate the decision to start agritourism, but external influences and mixed motives also matter (Nickerson et al., 2001).

Table 5: Determinants of adoption of agri-allied enterprises reported in the literature

Factor cluster	Variables	Food processing	Agri-entrepreneurship / FPO	Agro-tourism	Key sources
Human capital	Education, training, experience, information use	+	+	+ (training, communication)	Yadav et al. (2014); Ray et al. (2021); Donkor et al. (2018); Havale et al. (2022)
Resources and finance	Land, irrigation, family labour, credit	+ (credit)	+ (credit, labour)	+ (housing, location)	Sharma (2011); Birthal et al. (2013); Veesam & Nikam (2024)
Institutional support	Extension, group membership, schemes	+	+	Mixed (regulation)	Donkor et al. (2018); Mariano et al. (2012); Sharma (2011)
Market and infrastructure	Roads, market linkage, assured buyer	+	+	+ (tourist access)	Sharma (2011); Joshi et al. (2003); Venkatesh et al. (2017)
Socio-cultural	Attitude, risk orientation, gender roles, community norms	Not well studied	+ (scientific orientation)	− (where norms conflict)	Yadav et al. (2014); Sood et al. (2017); Nickerson et al. (2001)

Note: + indicates a positive association with adoption reported in at least one study; − indicates a negative association. Signs summarise reported findings and are not pooled estimates.

Determinants of Performance

Adoption does not guarantee success. The literature identifies several groups of factors associated with the performance of agri-allied enterprises, measured variously as profitability, turnover, capacity use, value added or sustainability.

6.1 Scale, capacity use and enterprise size

In a study of agro-processing industries in Himachal Pradesh, value addition was about 53 per cent and highest in fruit and vegetable processing; units remained viable even at low capacity use, small units showed better financial ratios, and the location of industry was driven more by demand than by supply of raw material (Sharma et al., 2010). Among Indian food and agribusiness firms, performance differed significantly by size; small and medium firms reported land and finance as their main constraints, and large firms reported regulation and corruption (Ali, 2016). For processing units in the state, the seasonality of fruit and the year-to-year variation in apple output make capacity use a central performance issue.

6.2 Entrepreneur characteristics

Among agripreneurs under the Agri-Clinics and Agri-Business Centres scheme, age, education, the age of the business and family size significantly influenced turnover (Afroz et al., 2022). The same human-capital variables that drive adoption thus continue to influence performance, but experience accumulated in running the enterprise becomes more important over time.

6.3 Collective organisation and governance

For FPOs, the number of members, the size of the board and the age of the organisation increased paid-up capital, which in turn increased turnover, and capital shortage was the biggest constraint (Kumar et al., 2023). Income, bargaining power, capacity building and branding enable FPO sustainability, while capital shortage, weak leadership, poor infrastructure and weak organisational structure inhibit it (Suresh & SS, 2024). In Himachal Pradesh, FPCs supported under the Horticulture Development Project had a combined turnover of about ₹6 crore in 2022-23 (World Bank, 2024), modest relative to their membership, which suggests that scale and working capital remain binding constraints.

6.4 Technology, management and efficiency

Technology alone does not ensure performance. In Kangra district, only 38 per cent of beneficiaries of subsidised polyhouses were genuinely interested in the technology, yield gaps were 26-36 per cent, and more than 40 per cent of growers had low technical efficiency because of poor management and design (Bala & Rana, 2022). Subsidy-led adoption without matching skills and motivation may therefore produce enterprises that exist but underperform. Off-season vegetable production, by contrast, has been highly remunerative, particularly under irrigation (Bala et al., 2011).

6.5 Market linkages, diversification and income

The income effects of diversification are positive but not unlimited. Diversification into high-value crops reduces the probability of poverty, with the largest gains for smallholders, but the effect weakens once more than about half the land is diversified (Birthal et al., 2015). Linkages

with processors raise incomes through assured markets and prompt payment (Venkatesh et al., 2017). For agritourism, perceived benefits include new customers, public education and family quality of life rather than profit alone (Tew & Barbieri, 2012), and agritourism farms show stronger generational continuity than other diversified farms (Barbieri, 2013). Performance indicators for agro-tourism should therefore include non-financial outcomes.

Integrated Analysis and Conceptual Framework

7.1 Common and enterprise-specific determinants

The review shows that the three enterprises share a common core of determinants—human capital, resources and finance, institutional support, and market and infrastructure access—but differ in the factor that most constrains them. For food processing the binding constraints are raw-material seasonality, working capital and market linkage. For agri-entrepreneurship and FPOs they are capital, leadership and scale. For agro-tourism they are location, regulation and socio-cultural acceptability, particularly regarding gender roles and hosting strangers in the home.

7.2 Synergies among the three enterprises

The three enterprises can reinforce one another in Himachal Pradesh. Natural-farming produce and temperate fruit provide distinctive raw material for small-batch processed products; tourists provide a local market for those products and a channel for building brands; and FPOs can aggregate raw material, share processing facilities and market both products and farm experiences. A household that runs a homestay can sell its own processed products to guests, which reduces marketing costs and raises margins. These linkages are, however, largely untested empirically and are put forward here as propositions.

7.3 Conceptual framework

Figure 1 presents the integrated framework. Household and individual factors, resource endowments, institutional support and market and infrastructure access influence the adoption of each enterprise, with socio-cultural factors and perceived behavioural control moderating the decision. Adoption leads to enterprise performance, which is influenced by scale and capacity use, managerial skill, collective organisation and value-chain linkages. Livelihood outcomes—income, income stability, employment and quality of life—follow from performance, and feed back into future adoption decisions through demonstration effects.

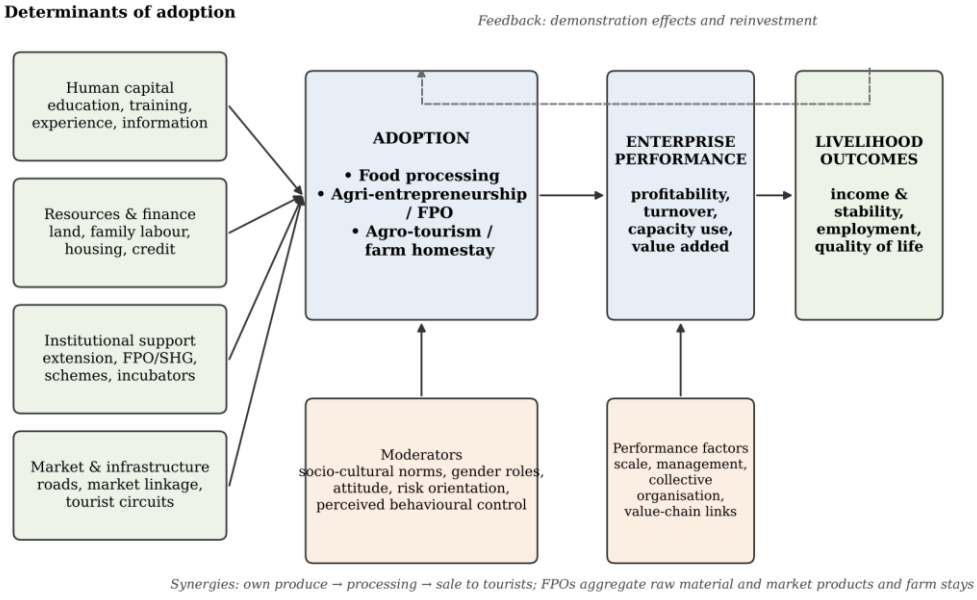


Figure 1: Integrated conceptual framework of the determinants of adoption and performance of agri-allied enterprises in Himachal Pradesh (developed by the author from the reviewed literature).

7.4 Propositions

Table 6: Testable propositions derived from the review

No.	Proposition
P1	Education, enterprise-specific training and extension contact are positively associated with adoption of all three agri-allied enterprises.
P2	Access to formal credit is positively associated with adoption of food processing and agri-entrepreneurship, and with adoption of agro-tourism where investment in rooms or facilities is required.
P3	Road access and distance to tourist circuits and markets are associated with adoption, more strongly for agro-tourism than for food processing.
P4	Membership of an FPO or self-help group is positively associated with adoption and performance of food processing enterprises.
P5	Socio-cultural factors, including gender norms and attitudes to hosting visitors, moderate the adoption of agro-tourism.
P6	Performance of processing enterprises is positively associated with capacity use and with assured raw-material supply.
P7	Households combining two or more agri-allied enterprises (for example, a homestay with processing) report higher and more stable incomes than households running one.

No.	Proposition
P8	Subsidy-led adoption without matching training is associated with lower technical efficiency and performance.

Policy Implications

The review suggests five priorities for policy in Himachal Pradesh.

1. **Integrate schemes at the household and cluster level.** PMFME, PMKSY, PMEGP, the FPO scheme, natural-farming programmes and the Home Stay Scheme are administered separately. Cluster-level convergence—for example, a natural-farming FPO with a common processing facility in a homestay village—would allow the synergies identified in Section 7.2 to be realised.
2. **Spread processing infrastructure to interior districts.** Larger food-processing projects are concentrated in Solan and Una. Small decentralised units, mobile processing and common facility centres in fruit-growing interior districts would reduce post-harvest losses and dependence on HPMC procurement.
3. **Address working capital and seasonality.** Processing units and FPOs report capital shortage as the main constraint. Seasonal working-capital lines and multi-product processing calendars (apple, stone fruit, vegetables, minor produce) would improve capacity use.
4. **Link training to subsidies.** The polyhouse evidence shows that subsidies without skills produce underperforming enterprises. Eligibility for enterprise subsidies could be linked to completion of training through the state agricultural universities, Krishi Vigyan Kendras and incubators.
5. **Develop an agritourism policy and better data.** The state has a large homestay sector but no dedicated agritourism policy, and national registries capture few rural homestays. A policy that defines farm-based tourism, supports farm activities for guests and links homestays with local produce, together with systematic data collection, would allow the sector's contribution to farm incomes to be measured.

Limitations and Directions for Future Research

This study has several limitations. First, it is a review based on secondary data and does not test the propositions empirically. Second, official data on food processing units and agritourism in Himachal Pradesh are fragmented; some figures are taken from parliamentary answers and press reports citing state departments rather than from a single statistical series, and the Economic Survey chapters on industries and tourism could not be fully accessed. Third, peer-reviewed evidence specific to Himachal Pradesh is limited, particularly for food processing, so several determinants are drawn from studies elsewhere in India or abroad. Fourth, the literature uses different definitions and measures of performance, which limits direct comparison.

Future research should test the propositions with primary household and enterprise surveys stratified by agro-climatic zone and enterprise type. Adoption can be modelled with logit or multinomial logit models, with Heckman's two-step procedure used to correct for selection

when performance is observed only for adopters (Heckman, 1979). The technical efficiency of processing units and farm enterprises can be estimated with stochastic frontier models that include inefficiency effects (Battese & Coelli, 1995), and the full framework, including latent constructs such as attitude and perceived behavioural control, can be tested with partial least squares structural equation modelling (Hair et al., 2011, 2019). Longitudinal studies of households that combine enterprises would show whether the synergies proposed here translate into more stable incomes.

Conclusion

Agri-allied enterprises offer Himachal Pradesh a route to raise farm incomes beyond what small holdings can deliver from crops alone. Secondary data show that food processing, agri-entrepreneurship and agro-tourism have all expanded in recent years, supported by central and state schemes, collective institutions and a large tourism market, but that growth is uneven across districts and enterprise types. The literature shows that adoption of all three enterprises depends on a common set of factors—human capital, resources and credit, institutional support, and market and infrastructure access—moderated by socio-cultural factors, while performance depends on scale, capacity use, management, collective organisation and value-chain linkages. Treating the three enterprises together rather than separately reveals complementarities that current schemes do not exploit. The integrated framework and propositions developed here provide a basis for empirical testing and for converged policy support.

References

Afroz, S., Singh, R., Nain, M. S., & Mishra, J. R. (2022). Determinants for agripreneurship development under Agriclinics and Agribusiness Centers (ACABC) scheme. *Indian Journal of Agricultural Sciences, 92*(2), 258–262. https://doi.org/10.56093/ijas.v92i2.122248

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ali, J. (2016). Performance of small and medium-sized food and agribusiness enterprises: Evidence from Indian firms. *International Food and Agribusiness Management Review, 19*(4), 53–63. https://doi.org/10.22434/IFAMR2016.0024

Alsos, G. A., Carter, S., Ljunggren, E., & Welter, F. (Eds.). (2011). *The handbook of research on entrepreneurship in agriculture and rural development*. Edward Elgar. https://doi.org/10.4337/9780857933249

Bala, B., & Rana, V. (2022). Polyhouse technology for high-value crops: Variability in practices and outcome. *Indian Journal of Agricultural Economics, 77*(3), 455–467. https://doi.org/10.22004/ag.econ.345207

Bala, B., Sharma, N., & Sharma, R. K. (2011). Cost and return structure for the promising enterprise of off-season vegetables in Himachal Pradesh. *Agricultural Economics Research Review, 24*(1), 141–148. https://doi.org/10.22004/ag.econ.109512

Barbieri, C. (2013). Assessing the sustainability of agritourism in the US: A comparison between agritourism and other farm entrepreneurial ventures. *Journal of Sustainable Tourism, 21*(2), 252–270. https://doi.org/10.1080/09669582.2012.685174

Barbieri, C., & Mahoney, E. (2009). Why is diversification an attractive farm adjustment strategy? Insights from Texas farmers and ranchers. *Journal of Rural Studies, 25*(1), 58–66. https://doi.org/10.1016/j.jrurstud.2008.06.001

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Battese, G. E., & Coelli, T. J. (1995). A model for technical inefficiency effects in a stochastic frontier production function for panel data. *Empirical Economics, 20*(2), 325–332. https://doi.org/10.1007/BF01205442

Birthal, P. S., Joshi, P. K., Roy, D., & Thorat, A. (2013). Diversification in Indian agriculture toward high-value crops: The role of small farmers. *Canadian Journal of Agricultural Economics, 61*(1), 61–91. https://doi.org/10.1111/j.1744-7976.2012.01258.x

Birthal, P. S., Roy, D., & Negi, D. S. (2015). Assessing the impact of crop diversification on farm poverty in India. *World Development, 72*, 70–92. https://doi.org/10.1016/j.worlddev.2015.02.015

Business Standard. (2010, June 28). Himachal Pradesh's novel scheme to attract tourists. https://www.business-standard.com/article/economy-policy/himachal-pradesh-s-novel-scheme-to-attract-tourists-110062800021_1.html

CSK Himachal Pradesh Krishi Vishvavidyalaya. (2023). *Him Palam R-ABI annual report 2022-23*. CSK HPKV, Palampur. https://hillagric.ac.in/research/dr/Him%20Palam%20R-ABI/downloads/HPAUannualreport2022-23.pdf

Department for International Development. (1999). *Sustainable livelihoods guidance sheets*. DFID.

Donkor, E., Onakuse, S., Bogue, J., & de los Rios Carmenado, I. (2018). Promoting value addition among farmers in the cassava food value chain in Nigeria. *British Food Journal, 120*(9), 2047–2065. https://doi.org/10.1108/BFJ-01-2018-0030

Feder, G., Just, R. E., & Zilberman, D. (1985). Adoption of agricultural innovations in developing countries: A survey. *Economic Development and Cultural Change, 33*(2), 255–298. https://doi.org/10.1086/451461

Government of Himachal Pradesh. (2025). *Economic survey of Himachal Pradesh 2024-25*. Department of Economics and Statistics. https://himachalservices.nic.in/economics/en-IN/eco-survey-2024-25.html

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139–152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Havale, D. S., Chaudhari, C., & Jadhav, S. (2022). Innovative agrotourism trends: Maharashtra State as a model for cross-cultural tourism in India. *Current Agriculture Research Journal, 10*(3). https://doi.org/10.12944/CARJ.10.3.15

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica, 47*(1), 153–161. https://doi.org/10.2307/1912352

Ilbery, B. W. (1991). Farm diversification as an adjustment strategy on the urban fringe of the West Midlands. *Journal of Rural Studies, 7*(3), 207–218. https://doi.org/10.1016/0743-0167(91)90085-7

Joshi, P. K., Gulati, A., Birthal, P. S., & Tewari, L. (2003). *Agriculture diversification in South Asia: Patterns, determinants, and policy implications* (MTID Discussion Paper No. 57). International Food Policy Research Institute. https://hdl.handle.net/10568/156931

Knowler, D., & Bradshaw, B. (2007). Farmers' adoption of conservation agriculture: A review and synthesis of recent research. *Food Policy, 32*(1), 25–48. https://doi.org/10.1016/j.foodpol.2006.01.003

Krishi Jagran. (2024, November 18). Nauni University launches agri incubation center under public-private partnership. https://krishijagran.com/news/nauni-university-launches-agri-incubation-center-under-public-private-partnership/

Kumar, S., Kumar, R., Meena, P. C., & Kumar, A. (2023). Determinants of performance and constraints faced by farmer producer organizations (FPOs) in India. *Indian Journal of Extension Education, 59*(2), 1–5.

Mariano, M. J., Villano, R., & Fleming, E. (2012). Factors influencing farmers' adoption of modern rice technologies and good management practices in the Philippines. *Agricultural Systems, 110*, 41–53. https://doi.org/10.1016/j.agsy.2012.03.010

McElwee, G. (2006). Farmers as entrepreneurs: Developing competitive skills. *Journal of Developmental Entrepreneurship, 11*(3), 187–206. https://doi.org/10.1142/S1084946706000398

Ministry of Agriculture and Farmers Welfare. (2013). *Lok Sabha unstarred question No. 270, answered on 06.08.2013*. Government of India. https://eparlib.nic.in/bitstream/123456789/644335/1/143712.pdf

Ministry of Agriculture and Farmers Welfare. (2023). *Lok Sabha unstarred question No. 400, answered on 05.12.2023*. Government of India. https://eparlib.nic.in/bitstream/123456789/2972287/1/AU400.pdf

Ministry of Food Processing Industries. (2024a). *Development of food processing sector: Lok Sabha unstarred question No. 2770, answered on 08.08.2024*. Government of India. https://eparlib.nic.in/bitstream/123456789/2980030/1/AU2770_KJ5zfl.pdf

Ministry of Food Processing Industries. (2024b). *Lok Sabha unstarred question No. 1837, answered on 05.12.2024*. Government of India. https://eparlib.sansad.in/bitstream/123456789/2984561/1/AU1837_MNCmdx.pdf

Ministry of Food Processing Industries. (2025a). *Formalisation of micro food processing enterprises under PMFME scheme: Lok Sabha unstarred question No. 636, answered on 06.02.2025*. Government of India. https://eparlib.sansad.in/bitstream/123456789/2987841/1/AU636_UmL5aG.pdf

Ministry of Food Processing Industries. (2025b). *Funds allocated under PMKSY: Lok Sabha unstarred question No. 1888, answered on 31.07.2025*. Government of India. https://eparlib.sansad.in/bitstream/123456789/2998463/1/AU1888_89N88l.pdf

Ministry of Micro, Small and Medium Enterprises. (2025). *Lok Sabha unstarred question No. 5393, answered on 03.04.2025*. Government of India. https://eparlib.sansad.in/bitstream/123456789/3010548/1/AU5393_icEm2i.pdf

Ministry of Tourism. (2024). *Lok Sabha unstarred question No. 118, answered on 22.07.2024*. Government of India. https://eparlib.nic.in/bitstream/123456789/2980583/1/AU118_Ee92Ey.pdf

Ministry of Tourism. (2025). *Lok Sabha unstarred question No. 3574, answered on 11.08.2025*. Government of India. https://tourism.gov.in/sites/default/files/2025-08/usq.3574%20for%2011.08.pdf

Nickerson, N. P., Black, R. J., & McCool, S. F. (2001). Agritourism: Motivations behind farm/ranch business diversification. *Journal of Travel Research, 40*(1), 19–26. https://doi.org/10.1177/004728750104000104

Phillip, S., Hunter, C., & Blackstock, K. (2010). A typology for defining agritourism. *Tourism Management, 31*(6), 754–758. https://doi.org/10.1016/j.tourman.2009.08.001

Press Trust of India. (2024, February 18). HP records 6% increase in tourist arrivals in 2023. *DT Next*. https://www.dtnext.in/news/national/hp-records-6-increase-in-tourist-arrivals-in-2023-768610

Ray, P., Panigrahi, R. S., & Shasani, S. (2021). Determinants of skill levels of farm youth with regard to agripreneurship: A multinomial regression approach. *Indian Journal of Extension Education, 58*(1), 58–62.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle* (R. Opie, Trans.). Harvard University Press.

Scoones, I. (1998). *Sustainable rural livelihoods: A framework for analysis* (IDS Working Paper No. 72). Institute of Development Studies. https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/3390

Sharma, H. R. (2011). Crop diversification in Himachal Pradesh: Patterns, determinants and challenges. *Indian Journal of Agricultural Economics, 66*(1), 97–114. https://doi.org/10.22004/ag.econ.204738

Sahu, P., & Karada, O. P. (2026). A Comprehensive Review of Machine Learning and Deep Learning Approaches for Crop Yield Prediction. Interdisciplinary Journal of AI, Machine Learning & Data Science, 1(3), e007. https://doi.org/10.66261/wqag3d92

Sharma, K. D., Pathania, M. S., & Lal, H. (2010). Value chain analysis and financial viability of agro-processing industries in Himachal Pradesh. *Agricultural Economics Research Review, 23*(Conference No.), 515–522. https://doi.org/10.22004/ag.econ.96927

Sharma, V. P. (2015). Determinants of small milk producers' participation in organized dairy value chains: Evidence from India. *Agricultural Economics Research Review, 28*(2), 247–261. https://doi.org/10.22004/ag.econ.229743

Sood, J., Lynch, P., & Anastasiadou, C. (2017). Community non-participation in homestays in Kullu, Himachal Pradesh, India. *Tourism Management, 60*, 332–347. https://doi.org/10.1016/j.tourman.2016.12.007

Suresh, V., & SS, S. (2024). Enabling and inhibiting factors of sustainability of farmer's producers organisations in India. *Discover Sustainability, 5*, Article 333. https://doi.org/10.1007/s43621-024-00527-5

Sznajder, M., Przezbórska, L., & Scrimgeour, F. (2009). *Agritourism*. CABI. https://doi.org/10.1079/9781845934828.0000

TeamLease RegTech. (2025). *Himachal Pradesh Home Stay Rules, 2025*. https://teamleaseregtech.com/updates/article/43970/himachal-pradesh-home-stay-rules-2025/

Tew, C., & Barbieri, C. (2012). The perceived benefits of agritourism: The provider's perspective. *Tourism Management, 33*(1), 215–224. https://doi.org/10.1016/j.tourman.2011.02.005

The Tribune. (2019, September 17). Cabinet nod to tourism policy draft. https://www.tribuneindia.com/news/archive/himachal/cabinet-nod-to-tourism-policy-draft-833578

The Tribune. (2024a, July 3). Apple production unlikely to top 6 LMT in Himachal; growers wary of weather. https://www.tribuneindia.com/news/himachal/apple-production-unlikely-to-top-6-lmt-in-himachal-growers-wary-of-weather-636152

The Tribune. (2024b, October 7). HPMC processes record 1,545 MT apple juice concentrate. https://tribuneindia.com/news/hpmc-processes-record-1545-mt-apple-juice-concentrate

The Tribune. (2024c, June 22). Himachal govt to crack whip on illegal homestays. https://www.tribuneindia.com/news/himachal/himachal-govt-to-crack-whip-on-illegal-homestays-632909

Veesam, H., & Nikam, V. (2024). What determines farmers' participation in the farmer producer organizations: Empirical evidence from India. *Journal of Agricultural Science and Technology, 26*(6), 1245–1259.

Venkatesh, P., Balasubramanian, M., Praveen, K. V., Aditya, K. S., Vijai Babu, D., Nithyashree, M. L., & Kar, A. (2017). Agro-processing industry and farmers' linkages: Pattern and impact on enhancing farmers' income in Tamil Nadu. *Agricultural Economics Research Review, 30*(Conference No.), 13–25. https://doi.org/10.5958/0974-0279.2017.00018.0

World Bank. (2024, December 5). *Boosting apple cultivation in Himachal Pradesh* [Feature story]. https://www.worldbank.org/en/news/feature/2024/12/05/boosting-apple-cultivation-in-himachal-pradesh

Yadav, D. S., Chahal, V. P., Singh, U., Kumar, A., Sood, P., & Thakur, S. K. (2014). Factors influencing entrepreneurial behaviour of farm women involved in vegetable farming: An empirical analysis. *Indian Journal of Agricultural Sciences, 84*(12), 1537–1541. https://doi.org/10.56093/ijas.v84i12.45327