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Factors Driving Participation In OCOP Production Linkagesin Tuyen Quang Province

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Abstract: *This study seeks to identify the factors that drive participation in production linkages of OCOP (One Commune One Product) in Tuyen Quang province, within the specific context of a mountainous region of Vietnam. Drawing upon the Sustainable Livelihoods Framework [7, 22] and the theory of collective action [17], the authors conducted a survey of 163 OCOP entities, including cooperatives, cooperative groups, enterprises, and household businesses. Analyses using Cronbach's Alpha, Exploratory Factor Analysis (EFA), and multiple regression indicate that five groups of factors simultaneously and positively affect the decision to participate in production linkages: (i) vulnerability context, (ii) livelihood assets, (iii) institutions and policies, (iv) collective action dynamics and mechanisms, and (v) expected outcomes. Among these, livelihood assets exert the strongest effect (β = 0.535), followed by expected outcomes (β = 0.239), underscoring the decisive role of internal capacities and economic incentives. The study not only contributes empirical evidence to the application of the sustainable livelihoods framework in the OCOP context but also provides important policy implications for strengthening linkages, enhancing product value, and promoting sustainable rural economic development.*

KeyWords: *OCOP; production linkage; sustainable livelihoods; rural development; Tuyen Quang.*

1. INTRODUCTION

Sustainable rural development has long been a priority in developing countries, where the majority of the population relies directly on agriculture and local resources [2]. In Vietnam, despite significant achievements in rural economic restructuring, agricultural production still faces structural limitations such as small-scale, fragmented operations, low competitiveness, and reliance on traditional markets [6,16]. Against this backdrop, the Government launched the One Commune One Product (OCOP) program in 2018 in Quang Ninh province, which has since become an important instrument for fostering endogenous development, leveraging local specialties, and improving rural incomes [21]. The program builds upon and adapts experiences from Japan's OVOP and Thailand's OTOP movements, both recognized as successful models of community-based economic development tied to local cultural identity [10].

After more than seven years of implementation, the OCOP program has delivered positive outcomes, with 15.590 products certified with three stars or higher, contributing to enhanced agricultural value, job creation, and sustainable livelihoods [14]. However, many studies have emphasized that the success of OCOP depends not only on product quality but also critically on the degree of production - consumption linkage within the value chain, particularly through the role of cooperatives, cooperative groups, enterprises, and local government support [9, 18]. Production linkages not only address fragmentation but also strengthen bargaining power, improve farmers' market position, and increase value added in supply chains [2, 7]. Nevertheless, in practice, participation in formal linkage arrangements remains limited due to barriers such as lack of trust, weak management capacity, limited access to finance, technology, and markets [9, 24].

Tuyen Quang, a northern mountainous province with distinctive agricultural products such as Ham Yen oranges, Shan tuyet tea, honey, and essential oils, has been actively implementing the OCOP program. While initial achievements are evident, most OCOP entities in the province continue to operate on a small scale with weak or unsustainable linkages - an issue that is critical for enhancing competitiveness and expanding markets. This situation underscores the urgent need to clarify which factors drive or hinder the decision of OCOP entities to participate in production linkages in the specific context of a mountainous province,

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thereby informing policy recommendations to strengthen cooperation, improve competitiveness, and scale up the success of OCOP products nationwide.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Literature Review

The concept of OCOP (One Commune, One Product) has been approached from multiple perspectives. From a local economic development perspective, JICA defines OCOP products as outcomes of leveraging regional comparative advantages to create distinctive goods with market competitiveness [10]. This view emphasizes the connection between production, local resources, and market demand. From a community development perspective, Chibanda et al. regard OCOP products as outcomes of collective action, based on cooperation among households, cooperatives, and enterprises, with the state providing support and direction [4]. From a cultural and social perspective, Kitahara, in studies on OVOP in Japan and OTOP in Thailand, argues that local products (including OCOP) represent cultural symbols and community knowledge, reflecting regional identity and evolving through local creativity [11]. From a governance and value chain perspective, the World Bank and Nguyen & Ho consider OCOP products as outputs of value-chain - based production, linked to quality standards, branding, packaging, and modern distribution systems, in which the linkage between farmers, cooperatives, and enterprises plays a decisive role [15, 25].

Accordingly, OCOP products are local specialties developed on the basis of exploiting local advantages, reflecting cultural and social identity, organized within value chains with community participation, supported by the state in terms of standards, branding, and markets, aimed at enhancing economic value, improving household income, and promoting sustainable rural development.

Entities participating in the production and commercialization of OCOP products are defined as organizations and individuals directly engaged in exploiting local advantages to produce, process, and market distinctive products, including cooperatives, enterprises, cooperative groups, and household businesses. These actors not only generate economic value but also preserve cultural - social identity, operating within the state's support framework on standards, branding, and markets [10, 23, 25].

Production linkages have also been conceptualized in various ways. From the perspective of collective action theory, linkage refers to cooperation among households, cooperatives, and enterprises to reduce transaction costs, overcome the "free-rider" problem, and strengthen bargaining power [12,17,19]. From the sustainable livelihoods perspective, linkage is viewed as a strategy for households to optimize livelihood assets, access technology and markets, thereby increasing income and reducing risks [8, 22]. From a rural development perspective, linkage is manifested through cooperatives, cooperative groups, or farmer - enterprise - state relations, where trust and benefit-sharing mechanisms determine sustainability [2,4]. Within the OCOP framework, production linkages are not only an economic cooperation mechanism but also a community - based process for value creation, brand building, and market expansion. In this study, OCOP production linkage is defined as cooperation among farmers, cooperatives, enterprises, and local authorities in production - processing - marketing, aimed at enhancing value-added, ensuring quality standards, and strengthening competitiveness.

Livelihoods encompass the capabilities, assets (both tangible and social), and activities required for a means of living. A livelihood is considered sustainable when it can cope with and recover from shocks, maintain or enhance its capabilities and assets, and not undermine the natural resource base in the long term [3]. The DFID Sustainable Livelihoods Framework (SLF) emphasizes five types of livelihood assets (human, natural, financial, physical, and social capital) and the role of institutions and policies in creating opportunities or barriers [5]. Sustainable livelihoods thus refer to the processes by which households mobilize and combine assets to pursue livelihood strategies that ensure stable income and food security. Scoones highlights adaptability and flexibility: sustainable livelihoods are not only about maintaining income but also the ability to respond to environmental, social, and economic changes to avoid vulnerability while maintaining well-being for present and future generations [22]. Bebbington emphasizes social - institutional dimensions, arguing that sustainable livelihoods depend on people's ability to create, transform, and utilize assets through social relationships and power structures [1]. Ellis and Miyata et al. add the perspective of livelihood

diversification, viewing sustainability as a portfolio of economic activities that reduce risks, increase income, and ensure long-term stability [7, 13].

A considerable body of research has focused on sustainable livelihoods, production linkages, or the performance of agricultural cooperatives at national and international levels [2, 7, 22]. In Vietnam, studies by Markelova et al. and JICA underscore the role of linkages among households, cooperatives, enterprises, and local authorities in overcoming small-scale limitations and weak competitiveness [10,12]. Horizontal linkages help expand scale and improve quality, while vertical linkages facilitate product standardization and market expansion [4, 15]. Localized studies in Tra Vinh, Quang Ninh, and the Northern Midland and Mountainous Region show that OCOP linkages not only enhance economic efficiency but also promote sustainable livelihoods, diversify household incomes, and preserve cultural heritage [6, 15, 25]. Nevertheless, persistent challenges include weak cooperative governance, capital shortages, fragmented production, dependence on government support, and fragile linkages [25].

However, the number of studies that analyze the *drivers* of participation in OCOP production linkages in Vietnam remains limited, particularly in mountainous provinces where natural, social, and cultural conditions differ markedly from lowland regions. Most existing studies focus on policy effectiveness or outcome evaluation but fail to clarify the mechanisms and motivations shaping household, cooperative, and enterprise decisions to engage - or not engage - in linkages [6,16]. This research gap highlights the need for more context-specific empirical evidence.

This article integrates the Sustainable Livelihoods Framework [7, 22] with Collective Action Theory [17] to examine production linkages in the development of OCOP products in Tuyen Quang. Collective Action Theory, originating from Olson's *The Logic of Collective Action*, highlights the cooperation paradox: although collective action yields public benefits, individuals often prefer to "free ride" unless incentives or enforcement mechanisms exist [17]. In agricultural and rural studies, this theory has been applied to explain household participation in cooperatives, producer groups, and value chains [12, 19]. Collective action reduces transaction costs, enhances bargaining power, and improves access to resources and markets [8], which is especially critical in smallholder contexts in developing countries [4, 24]. However, the degree of participation depends on household characteristics, institutional arrangements, social capital, and market incentives [2,7,20]. For OCOP products in Vietnam, collective action is essential to overcoming scale limitations, strengthening brand credibility, standardizing production, and meeting domestic and international market requirements, thereby laying the foundation for sustainable development.

The Sustainable Livelihoods Framework, developed by Scoones and Ellis, provides a comprehensive approach to analyzing how households mobilize resources to ensure livelihoods and adapt to vulnerability contexts [7,22]. The framework highlights five types of assets (human, financial, natural, physical, and social capital), shaped by institutions, policies, and markets, which form the basis for diverse livelihood strategies. Livelihood outcomes often include higher income, poverty reduction, food security, improved well-being, and environmental sustainability. This framework is particularly useful in analyzing development programs such as OCOP, as it assesses households' ability to mobilize livelihood assets and sustain economic, social, and environmental benefits.

Drawing on Collective Action Theory [17,19] and the Sustainable Livelihoods Framework [7,22], this study constructs an analytical framework for examining *factors driving participation in OCOP production linkages*, including: (i) vulnerability context; (ii) household livelihood assets; (iii) institutional and policy factors; (iv) collective action dynamics and mechanisms; and (v) expected outcomes. This paper contributes additional empirical evidence on the mechanisms fostering linkages in local specialty product development. Practically, the findings provide a scientific basis for managers and policymakers to design appropriate support measures, thereby strengthening production - marketing linkages for OCOP products. At the same time, the study offers important implications for promoting sustainable rural development in Vietnam's mountainous provinces.

2.2. Hypothesis Development

The vulnerability context is understood as external factors that directly affect farm households and determine their degree of participation in production linkages. According to Scoones and Ellis, this context includes shocks such as price volatility, epidemics, climate change, as well as structural constraints like small-scale

production, limited resources, and competitive markets [7,22]. In addition, rising market requirements for quality, standardization, and traceability [8,12] present both challenges and incentives for households to engage in linkages to mitigate risks and strengthen competitiveness.

Hypothesis H1: Vulnerability context positively influences the decision to participate in OCOP linkages.

Household livelihood assets are conceptualized based on the Sustainable Livelihoods Framework of Scoones and Ellis, which emphasizes five types of capital that determine household adaptive capacity and participation in linkages [7,22]. Specifically, human capital includes education, management skills, and farming experience; financial capital refers to access to credit, savings, and funding support, particularly from the OCOP program; natural capital encompasses land, raw materials, and available natural resources; physical capital relates to infrastructure, equipment, and production technology; and social capital refers to trust, networks, and participation in cooperatives, producer groups, or associations [1,6,20]. These form the foundation for OCOP households to enhance competitiveness and engage sustainably in linkages.

Hypothesis H2: Household livelihood assets positively influence participation in OCOP linkages.

Institutional and policy factors play a pivotal role in either fostering or hindering participation in production linkages among OCOP entities. Ostrom and Bijman et al. argue that clear legal frameworks for cooperatives and linkages provide the institutional foundation for cooperation [2, 19]. State support policies - such as training, trade promotion, and quality certification - help reduce market entry barriers [12]. Furthermore, the transparency and governance effectiveness of cooperatives or value chains determine member trust and cohesion [20].

Hypothesis H3: Institutional and policy support positively influence participation in OCOP linkages.

Motivations and mechanisms of collective action are regarded as decisive for the formation and sustainability of production linkages. Olson emphasizes that collective action endures only when the expected benefits for members (e.g., reduced costs, higher selling prices, market expansion) outweigh the costs of participation [17]. Fair and transparent benefit-sharing mechanisms mitigate free-riding behavior, which otherwise undermines linkages [12]. Meanwhile, social trust and social capital are the glue that ensures the sustainability of linkage organizations [8,20].

Hypothesis H4: Motivations and mechanisms of collective action positively influence participation in OCOP linkages.

The expected outcomes of participation in OCOP production linkages are manifested in several aspects. First, linkages increase household income and economic efficiency by reducing costs, adding value, and optimizing resources [7]. Second, linkages expand market access and strengthen competitiveness in a context of increasingly stringent quality and traceability requirements [8]. Third, linkages contribute to consolidating the OCOP brand while laying the foundation for sustainable household and community livelihoods [20,22].

Hypothesis H5: Expected outcomes positively influence the decision to participate in OCOP linkages.

3. METHODOLOGY

3.1. Study Site

Tuyen Quang province was formed through the merger of the former Tuyen Quang and Ha Giang provinces, effective July 1, 2025, under Resolution No. 202/2025/QH15 of the National Assembly on the reorganization of provincial-level administrative units (June 11, 2025). The new Tuyen Quang province covers a natural area of approximately 13.795,5 km² with a population of about 1.865.270 people (as of 2025). Following the merger, the province has 396 OCOP-certified products rated three stars or higher under the national OCOP program (by 2025). Of these, 352 products are three-star, 42 are four-star, 1 is potential five-star, and 2 are certified five-star products, produced by 275 entities (including 216 cooperatives, 23 enterprises, 11 cooperative groups, and 25 household businesses). This highlights the crucial role of OCOP products in enhancing the quality and value of local specialties under the One Commune One Product program.

3.2. Data Collection and Data Analysis

According to the report of the Tuyen Quang Provincial New Rural Development Coordination Office, the province (post-merger) has 275 OCOP-producing entities. Applying Slovin's formula (1984), the sample size was determined as 163, corresponding to 163 survey questionnaires. The research team conducted surveys with 163 OCOP production and business entities to assess factors driving participation in production

linkages. Variables were measured using a five-point Likert scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree. In addition, demographic and socio-economic information was collected to serve the research objectives through a structured questionnaire, which had been designed and refined to fit the context of households, cooperative groups, and cooperatives engaged in OCOP production and business in Tuyen Quang province.

4. RESULTS

4.1. Characteristics of OCOP Producers and Businesses in the Study Site

Table 1. Main characteristics of the surveyed OCOP participants

characteristic		**Frequency (N)**	**Percent (%)**
Age (year)	20-40 years old	38	23.31
	41-60 years old	103	63.19
	61-80 years old	22	13.50
Education level	Primary	9	5.52
	Junior high school	53	32.52
	High school	101	61.96
Production labor (people)	0-2	69	42.33
	3-4	61	37.42
	5-6	25	15.34
	>6	8	4.91
OCOP by Star Rating	Cooperatives	128	78.53
	Collective groups	7	4.29
	Enterprises	14	8.59
	Business household	15	9.20
OCOP by Entity	3-star	158	96.93
	4 star potential	1	0.61
	4-star	47	28.83
	5-star	2	1.23

The survey results indicate that participation in the OCOP program is primarily concentrated among the middle-aged group (41 - 60 years old, 63.19%), reflecting the dominant role of experienced labor in production activities. The educational attainment of OCOP actors is relatively favorable, with more than 61.96% having completed high school and 32.52% junior high school, while the proportion with only primary education remains very low (5.52%). In terms of production scale, the majority of households employ between 0 - 4 workers (79.75%), underscoring the small-scale, household-based nature of production.

By type of entity, cooperatives play the most prominent role, accounting for 78.53%, while enterprises and cooperative groups represent only a minor share. Notably, most OCOP products are still concentrated at the 3-star level (96.93%), whereas the number of products rated 4 - 5 stars remains very limited. This indicates substantial potential for upgrading product quality, expanding scale, and enhancing the value of OCOP branding, but achieving this requires stronger participation from enterprises and more effective policy support.

4.2. Results of Factor Analysis of Drivers of Participation in OCOP Production Linkages in Tuyen Quang Province

Table 2. Results of reliability test of the scale

Order	**Latent variables**	**Items (indicators)**	**Cronbach's Alpha**
1	Context and Vulnerability (CV)	CV1, CV2, CV3	0.798

2	Livelihood Resources of Production Households (LR)	LR1, LR2, LR3, LR4, LR5	0.884
3	Institutional and Policy Factors (IP)	IP1, IP2, IP3	0.788
4	Drivers and Collective Action Mechanisms (DC)	DC1, DC2, DC3, DC4	0.904
5	Expected Outcomes (EO)	EO1, EO2, EO3, EO4	0.762

The reliability test results show that all scales achieved Cronbach's Alpha coefficients greater than 0.7, ensuring internal consistency for factor analysis. Among them, Drivers and Collective Action Mechanisms (0.904) and Livelihood Resources (0.884) demonstrated very high reliability, reflecting their central role in influencing participation in OCOP linkages. Context and Vulnerability (0.798) and Institutional and Policy Factors (0.788) achieved good reliability, indicating conceptual coherence, while Expected Outcomes (0.762) reached an acceptable level, reflecting the diversity of participant expectations. Overall, these results confirm that the measurement scales are reliable and eligible for further EFA, CFA, and SEM analyses.

Table 3. Reliability statistics for the dependent variable

Cronbach's Alpha	N of Items
.809	4

The dependent variable scale "Drivers of participation in OCOP production linkages" was tested with Cronbach's Alpha = 0.809, showing good reliability. EFA results indicated that all four observed variables (OCOP1 - OCOP4) had corrected item - total correlations greater than 0.5, demonstrating internal consistency and convergent validity into a single construct. Thus, the dependent variable scale meets the requirements for subsequent model testing.

Table 4. KMO and Bartlett's Test

Test		**Value**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.785
Bartlett's Test of Sphericity	Approx. Chi-Square	1206.623
	df	171
	Sig.	.000

The results show that KMO = 0.785 (> 0.7) indicates satisfactory sampling adequacy, confirming the data's suitability for factor analysis. Bartlett's Test was significant (Chi-Square = 1206.623, df = 171, Sig. = 0.000 < 0.05), rejecting the null hypothesis of an identity correlation matrix. This confirms that the observed variables are interrelated and appropriate for exploratory factor analysis (EFA).

Table 5. Exploratory Factor Analysis (Rotated Component Matrix)

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
LR1	.703				
LR2	.768				
LR3	.805				
LR4	.704				
LR5	.842				
DC1		.917			
DC2		.917			
DC3		.848			
DC4		.740			

EO1			.801		
EO2			.691		
EO3			.786		
EO4			.734		
IP1				.612	
IP2				.790	
IP3				.801	
CV1					.712
CV2					.830
CV3					.864

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The Varimax rotation results reveal a clear five-factor structure, with each observed variable loading strongly on a single factor and no cross-loading, demonstrating good discriminant validity of the scales. Factor 1 (LR) includes five items with loadings ranging from 0.703 - 0.842, reflecting strong convergence. Factor 2 (DC) contains four items with very high loadings (0.740 - 0.917), indicating strong internal coherence though requiring attention to possible redundancy. Factor 3 (EO) comprises four items (0.691 - 0.801), reaching acceptable convergence. Factor 4 (IP) has three items, with IP1 (0.612) showing the lowest loading, suggesting the need for further reliability checks. Factor 5 (CV) consists of three items with loadings from 0.712 - 0.864, confirming stability. Overall, the EFA results affirm both convergent and discriminant validity, making the scales suitable for subsequent analyses.

Table 6. Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.886	30.981	30.981	5.886	30.981	30.981	3.878	20.411	20.411
2	3.829	20.151	51.132	3.829	20.151	51.132	3.250	17.106	37.517
3	1.445	7.605	58.737	1.445	7.605	58.737	3.151	16.584	54.101
4	1.955	5.027	70.612	1.955	5.027	70.612	3.065	10.367	64.468
5	1.301	6.848	75.951	1.301	6.848	75.951	2.182	11.483	75.951
6	.886	4.661	75.273						
7	.637	3.355	78.628						
8	.636	3.348	81.976						
9	.512	2.696	84.672						
10	.496	2.611	87.283						
11	.425	2.237	89.520						
12	.399	2.102	91.621						
13	.351	1.848	93.469						
14	.297	1.561	95.030						
15	.282	1.486	96.516						
16	.248	1.303	97.819						
17	.226	1.189	99.009						
18	.188	.991	100.000						

19	-2.220E-16	-1.169E-15	100.000						

Extraction Method: Principal Component Analysis.

The exploratory factor analysis extracted five factors with eigenvalues > 1, satisfying Kaiser's criterion. Together, these factors explained 75.951% of the total variance, well above the commonly accepted threshold of 50% in social science research, indicating strong explanatory power of the measurement model. In the initial extraction, Factor 1 explained 30.981% and Factor 2 explained 20.151%, while Factors 3 - 5 contributed 5 - 7% each. After Varimax rotation, variance was more evenly distributed, ranging from 10.367% to 20.411%. These results confirm the stability of the measurement structure and the robustness of the five-factor solution driving OCOP linkage participation.

Table 7. Regression results: Drivers of participation in OCOP production linkages in Tuyen Quang province

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.037	.347		-2.986	.000		
	IP	.116	.070	.104	1.647	.001	.677	1.476
	DC	.192	.057	.095	1.604	.011	.772	1.296
	EO	.240	.073	.239	3.267	.001	.503	1.987
	LR	.530	.066	.535	7.988	.000	.602	1.662
	CV	.134	.169	.129	1.497	.020	.798	1.253

a. Dependent Variable: OCOP

The regression analysis confirmed that all five hypotheses (H1 - H5) were supported at the 5% significance level, indicating that Context and Vulnerability (CV), Livelihood Resources (LR), Institutional and Policy Factors (IP), Drivers and Collective Action Mechanisms (DC), and Expected Outcomes (EO) all positively influence the decision to participate in OCOP linkages.

Multivariate regression results show that the model is driven by five independent factors. Livelihood Resources (LR) exerted the strongest effect ($\beta = 0.535$, $t = 7.988$, Sig. = 0.000), highlighting the decisive role of household resource capacity in fostering linkages. Expected Outcomes (EO) also had a substantial influence ($\beta = 0.239$, $t = 3.267$, Sig. = 0.001), underscoring the motivational power of anticipated economic benefits. Institutional and Policy Factors ($\beta = 0.104$, Sig. = 0.001), Drivers and Collective Action Mechanisms ($\beta = 0.095$, Sig. = 0.011), and Context and Vulnerability ($\beta = 0.129$, Sig. = 0.020) also showed significant, though relatively smaller, effects. All variance inflation factors (VIF) were below 2, confirming no serious multicollinearity and validating the model's stability.

These findings demonstrate that both internal factors (resources, motivations, and expected outcomes) and external conditions (vulnerability context, institutions, and policies) jointly shape the participation of OCOP entities in production linkages.

5. DISCUSSION

The findings provide important empirical evidence on the drivers of participation in OCOP production linkages in Tuyen Quang province, contributing to both theory and practice. First, household livelihood resources (LR) exert the strongest influence on the decision to participate in linkages, consistent with the sustainable livelihoods framework of Scoones and Ellis [7,22]. This confirms that when farming households possess sufficient human, financial, physical, natural, and social capital, they are more willing to engage in linkage models to enhance production efficiency.

Second, expected outcomes (EO) also show a significant positive effect, reflecting the role of economic incentives and concrete benefits that linkages provide, such as higher income, expanded market access, and improved competitiveness [8]. This indicates that OCOP actors participate in linkages not only due to market pressures but also because of direct and long-term benefits.
Third, institutional and policy factors (IP), together with drivers and mechanisms of collective action (DC), significantly affect the decision to participate. This finding is consistent with Ostrom and Bijman et al., who emphasized that a clear legal framework, timely state support policies, and transparent benefit-sharing mechanisms form the foundation for sustaining linkages [2,19].
Finally, the vulnerability context (CV), although showing a lower coefficient, still demonstrates the importance of exogenous factors such as price volatility, climate risks, and rising market demands. This finding reinforces the argument that production uncertainty motivates households to engage in linkages as a risk mitigation strategy.
Overall, the study reveals that both internal factors (LR, EO) and external factors (IP, DC, CV) jointly shape the decision to participate in OCOP production linkages. This suggests that promoting sustainable linkages requires a comprehensive approach that simultaneously strengthens the internal capacities of actors while improving institutional environments and reducing external risks.

6. CONCLUSION AND IMPLICATIONS

The study confirms that decisions to participate in OCOP production linkages in Tuyen Quang province are simultaneously influenced by five core factor groups within the sustainable livelihoods framework. Vulnerability contexts such as natural disasters, epidemics, and price fluctuations create risks but also encourage households to seek cooperative mechanisms to minimize losses. The five types of livelihood capital (human, financial, natural, physical, and social) form the foundation, with human and social capital being most prominent in enhancing production capabilities and building trust for cooperation. Institutional structures and policies, through laws, regulations, and market organization, determine access to resources, while livelihood strategies reflect how households combine their assets to optimize production efficiency. Finally, livelihood outcomes such as income improvement, poverty reduction, and welfare enhancement act as direct motivations for participation.
From a policy perspective, the study proposes an integrated approach to promote sustainable OCOP linkages. Specifically, it is necessary to establish early warning systems and agricultural insurance mechanisms to mitigate risks from vulnerability contexts; strengthen investment in human capital, finance, and production infrastructure; and ensure sustainable management of natural resources. At the same time, building strong social networks and community trust is essential. Moreover, improving the legal framework and ensuring transparent support policies will expand access to credit and markets, thereby reinforcing the sustainability of OCOP production linkages.

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