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Reducing Tourism Leakage through Agricultural Linkages: The Role of Agro-Tourism in Economic Retention in Diebu County, China

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ABSTRACT

Agro-tourism has emerged as a promising strategy to enhance rural economic development by linking agriculture with the tourism sector. In Diebu County, however, high tourism leakage in the accommodations sector limits local communities' ability to benefit from tourism-driven growth. This study explores how agro-tourism can reduce tourism leakage by strengthening connections between local agricultural producers and the accommodations sector. It investigates factors influencing economic retention and identifies opportunities to integrate local agriculture into rural tourism supply chains. A qualitative case study approach was used, with data collected through semi-structured interviews with accommodation providers, community leaders, and government tourism officials. Thematic analysis revealed a strong interest in local sourcing, but also challenges such as unreliable supply, limited coordination, and inadequate policy support. Nonetheless, emerging examples of informal cooperation and farm-to-table practices illustrate the potential of agro-tourism to enhance local economic benefits. Theoretically, this research contributes to the understanding of tourism-agriculture linkages in rural development. Practically, it provides insights for designing policies and programs that promote collaboration between the agricultural and

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tourism sectors. In conclusion, agro-tourism presents a viable pathway to reduce tourism leakage and support inclusive economic development in Diebu County.

Keywords: Agro-tourism; Tourism Leakage; Economic Retention; Rural Development; Agricultural Linkage

1. Introduction

Agro-tourism has emerged as a key strategy for enhancing sustainable rural development by diversifying local economies, creating employment opportunities, and strengthening community engagement through the integration of agriculture and tourism^[1,2]. It provides urban tourists with authentic rural experiences such as farm stays, local food, and participation in agricultural activities while offering rural communities an avenue to increase household income and promote cultural preservation^[3]. Agro-tourism is increasingly seen not just as a recreational or cultural product but as a developmental tool that can mobilize local resources for economic gain^[4]. One major barrier to maximizing the benefits of rural tourism is tourism leakage, a phenomenon where a significant portion of tourist expenditure leaves the local economy due to reliance on imported goods, external service providers, or foreign-owned businesses^[5,6]. This issue is particularly prevalent in the accommodations sector, where many establishments depend on external suppliers for food, materials, and operational inputs, leading to limited retention of tourism-generated income at the local level^[5,7]. While leakage studies sometimes overemphasize losses, research consistently shows that reducing leakage by increasing local linkages—such as sourcing agricultural products locally—can substantially improve community-level economic outcomes^[8,9].

Diebu County, a rural area in Gansu Province, China, is rich in natural beauty and Tibetan cultural heritage, making it a potentially attractive destination for nature-based and cultural tourism^[10]. As an ethnically diverse region with a significant Tibetan population, Diebu is not only culturally distinctive but also environmentally fragile and politically important^[11]. The county has been designated both as an ecologically sensitive area and a key rural revitalization region under national development strategies^[12]. In recent years, tourism develop-

ment has gained momentum in the region. However, the benefits of tourism remain limited due to a combination of underdeveloped local supply chains, weak integration with agricultural production, and external dependencies in the accommodations sector^[7,13]. These factors contribute to high levels of economic leakage and reduce the potential for tourism to serve as a meaningful driver of inclusive rural development^[9,14].

This study aims to explore the potential of agro-tourism as a tool to reduce tourism leakage and improve economic retention in Diebu County's accommodations sector. Specifically, it focuses on identifying how stronger linkages between tourism enterprises and local agricultural producers can enhance the local value chain^[15]. Through qualitative fieldwork involving accommodation providers, local community leaders, and tourism officials, the research seeks to understand both the challenges and opportunities involved in embedding agriculture within the rural tourism experience in Diebu^[16–18].

This study contributes to the existing body of rural tourism and agricultural economics research by examining tourism-agriculture linkages in the context of a lesser-studied rural region in Diebu County of China^[19]. While agro-tourism has been widely explored in international literature^[1–3], there remains a significant gap in empirical research that focuses on how local agricultural systems can be integrated into rural tourism development to reduce economic leakage within the Chinese context^[20]. By focusing on a remote, ethnically diverse area in western China, this research introduces new geographic and cultural dimensions into the discourse on sustainable rural development^[21].

Furthermore, the study employs a qualitative approach that prioritizes the voices of multiple stakeholder groups, including accommodation providers, local community leaders, and local government tourism officials^[15,16]. This multi-perspective analysis provides a more comprehensive understanding of the institutional,

logistical, and perceptual barriers to building strong tourism-agriculture linkages^[22,23]. Such an approach is rarely adopted in existing Chinese tourism literature, which often emphasizes quantitative or top-down policy analysis^[24,25].

In practical terms, the research offers policy-relevant insights into how rural destinations like Diebu County can enhance their local supply chains and retain a greater share of tourism revenue^[26]. It identifies specific areas where interventions such as improved coordination, infrastructure investment, and farmer capacity building could lead to more inclusive and economically sustainable tourism development^[13,14].

2. Related Works

2.1. Tourism Leakage in Rural Economies

Tourism leakage where tourism-generated income exits the local economy is a persistent issue in rural tourism development, particularly in regions that lack strong local supply chains or rely heavily on imported goods and external services^[5,6]. Leakage is often most visible in the accommodations sector, where food, beverages, and amenities are sourced from distant suppliers rather than local producers^[7]. This issue is further exacerbated in regions where rural supply chains are fragmented and logistics for sourcing from smallholder farmers remain underdeveloped^[8,9].

This concept is central to tourism value chain theory, which emphasizes that enhancing local economic linkages, especially “backward linkages” to agriculture, can significantly increase economic retention and improve livelihoods^[10,11]. In many cases, short food supply chains and green tourism logistics systems are emerging as critical strategies to localize procurement, reduce environmental pressures, and keep tourism value within communities^[12,13]. Although leakage can be high, studies suggest that the portion of revenue that is retained may still be meaningful, especially in areas with few other income sources^[5,14]. These insights underline the importance of creating systems that increase local participation in tourism value chains through procurement, labor, and entrepreneurship^[15].

2.2. Agro-Tourism and Its Economic and Social Benefits

Agro-tourism, defined in this study as tourism that integrates agricultural activities such as farm visits, home stays, local food experiences, and on-farm cultural exchanges, has been widely recognized as a sustainable rural development strategy^[1,2]. It contributes to income diversification, rural employment, cultural preservation, and place-based tourism^[3]. By embedding tourism activities within local agricultural systems, communities can retain a greater share of tourism-generated value within their own economies^[16].

This integration is particularly important within the framework of sustainable rural livelihoods, which emphasizes the importance of diversified and resilient income sources for rural communities^[17]. Agro-tourism enhances not only financial capital but also social and human capital by fostering trust, collaboration, and skills among farmers and tourism operators^[18]. However, the success of agro-tourism depends heavily on local coordination, consistent supply chains, and supportive infrastructure—all of which remain underdeveloped in many marginalized or remote areas^[19,20].

Recent studies have also noted the role of digital technologies, such as traceability applications and online marketplaces in enhancing supply chain transparency and building consumer trust in agro-tourism contexts^[21,22]. Furthermore, growing climate variability in western China has prompted agro-tourism operators to explore climate-resilient crop choices and irrigation innovations that combine environmental sustainability with local sourcing strategies^[23,24].

2.3. Local Sourcing and Embeddedness in Value Chains

A critical component of reducing tourism leakage is strengthening local sourcing within tourism enterprises. Research has shown that when accommodations source food and services from local producers, not only does economic retention increase, but so does guest satisfaction due to the authenticity of the experience^[25,26]. Local food procurement also fosters community pride, enhances tourist learning experiences, and supports circu-

lar economies in rural areas^[11,27].

However, local sourcing is not solely an economic decision, it is heavily influenced by social embeddedness, including trust, informal relationships, and perceptions of quality and reliability^[28,29]. These relational and cultural dimensions often shape transaction patterns more deeply than pricing or efficiency metrics. Such social factors are frequently overlooked in macroeconomic or policy-driven tourism assessments, yet they are vital to understanding why local procurement may or may not occur^[30]. Stakeholder attitudes, past cooperation experiences, and informal social norms all influence the feasibility of integrating agriculture into tourism operations, especially in underdeveloped or ethnically diverse regions^[7,31]. Therefore, relational dynamics and embedded social systems must be examined alongside infrastructure and policy mechanisms when designing strategies for sustainable rural tourism^[32].

2.4. Stakeholder Participation and Rural Integration Strategies

Most of the literature on agro-tourism and tourism leakage emphasizes structural or policy-level interventions. However, there is a growing recognition of the value of participatory rural appraisal (PRA) and bottom-up planning in designing more inclusive and context-sensitive rural development strategies^[29]. Studies in Northern Thailand and Iran have demonstrated that when stakeholders—including farmers, local leaders, and tourism operators—are actively involved in shaping tourism-agriculture linkages, outcomes are more sustainable and equitable^[3,8].

More recent research further reinforces this view, showing that stakeholder empowerment, community-led tourism, and collaborative governance are critical to agro-tourism sustainability and rural revitalization^[25,32]. For example, PRA exercises in Meghalaya, In-

dia demonstrated that tourism initiatives rooted in community dialogue produced stronger coordination and participation outcomes than externally imposed models^[30].

Stakeholder perceptions, therefore, are not just useful for implementation—they shape the underlying feasibility and legitimacy of integration strategies^[31]. This highlights the importance of a qualitative, stakeholder-centered approach, especially in rural and ethnically diverse regions where top-down models may not reflect local realities^[25,32].

2.5. Research Gap

Although tourism leakage and agro-tourism have been widely discussed in both international and Chinese literature, several critical gaps remain. Most existing Chinese studies concentrate on economically advanced or peri-urban rural areas, where agro-tourism development benefits from better infrastructure, government subsidies, and proximity to urban markets^[33,34]. These studies often adopt quantitative or top-down policy analyses, which overlook the micro-level complexities of local stakeholder behaviors, informal networks, and embedded economic practices^[35].

As shown in **Table 1**, there is a clear geographical and methodological gap in current research. Remote, ethnically diverse areas like Diebu County actively pursuing rural tourism yet grappling with persistent economic leakage and weak tourism-agriculture integration—remain underexplored in empirical literature^[36]. Moreover, few studies adopt a qualitative, stakeholder-centered perspective that incorporates the lived experiences of accommodation providers, cooperative leaders, and local officials^[37]. This results in a limited understanding of how institutional, social, and market-based barriers intersect to constrain local economic retention^[25,36].

Table 1. Summary of relevant studies.

County	Title	Findings	Suggestion	Sources
Uganda	Tourism Revenue Leakage and Retention	Despite high leakage (75%), retained tourism revenue was higher than other income sources	Strengthen local supply chains and promote local retention of tourism income	[5]

Table 1. Cont.

County	Title	Findings	Suggestion	Sources
Indonesia	Leakage in High-End Hotels	4–5 star chain hotels had the highest leakage; local sourcing could reduce this	Use local products in hospitality and implement supportive tourism policies	[6]
Northern Thailand	Community-Based Tourism and Leakage Reduction	Village-level strategies like local ownership and direct sourcing reduced leakage	Encourage community-level planning and build local tourism-agriculture linkages	[8]
Romania	Agro-tourism and Cultural Preservation	Agro-tourism supports income, preserves culture, and revitalizes rural identity	Support agro-tourism within national rural development strategies	[1]
India	Agri-tourism as a Rural Development Tool	Agri-tourism increases income, boosts rural infrastructure, and supports local culture	Scale up agri-tourism through infrastructure and policy support	[2]
Tehran Province, Iran	Agro-tourism Potential and Development Challenges	Agro-tourism has strong potential but needs better coordination and infrastructure	Invest in local infrastructure and facilitate coordination among actors	[3]
Russia	Policy Integration in Agro-tourism	Agri-tourism requires conceptual clarity and consistent integration with rural planning	Define agritourism concepts clearly and align with policy frameworks	[4]
Teriyaki	Agro-tourism and Youth Retention in Rural Areas	Agro-tourism supports organic farming, job creation, and sustainable local development	Use agro-tourism as a tool for sustainable rural and environmental development	[23]
Romania	Agro-tourism and Youth Retention in Rural Areas	Agro-tourism creates rural jobs and helps retain youth in farming communities	Promote agro-tourism to create employment and repopulate rural areas	[26]

Additionally, while tourism leakage is often framed purely as an economic problem, there is a lack of research employing integrative theoretical models that combine social embeddedness, livelihood diversification, and value chain distribution^[37]. Emerging research underscores that addressing leakage requires attention to both vertical structures (institutions and policy) and horizontal linkages (peer-level coordination), as well as cultural and geographic specificity^[31,32].

2.6. Research Framework

To address these research gaps, this study develops a conceptual framework that synthesizes insights from three complementary theoretical perspectives. These theories were selected based on their relevance to the multidimensional nature of rural tourism and economic retention in underdeveloped areas like Diebu. The Sustainable Rural Livelihoods Framework^[22] was chosen because it directly addresses the need for income diversification and livelihood security in impoverished rural

settings, making it suitable for regions targeted by rural revitalization policies. Embeddedness Theory^[27] was selected for its ability to explain how social relationships, trust, and informal networks shape local economic behavior a critical factor in ethnically diverse areas where formal institutions may be weak. Lastly, Tourism Value Chain Theory^[14] was adopted to illuminate how economic value is distributed across tourism supply chains, especially in identifying “leakage points” and opportunities for backward linkages to agriculture.

Collectively, these theories provide an integrated lens that captures livelihood dynamics, social capital, and industrial structures, thereby offering a holistic approach to analyzing economic retention in the tourism-agriculture interface^[14,22,27]. These theoretical perspectives are brought together in the conceptual framework illustrated below (see **Figure 1**), which integrates the study three core research themes: agro-tourism development, local agricultural integration, and economic retention within the tourism sector^[37].

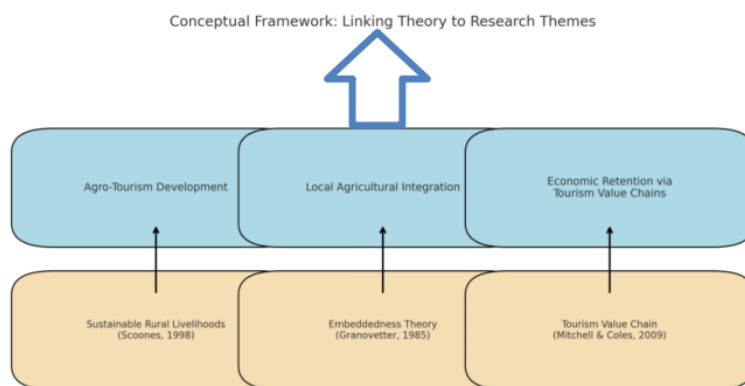


Figure 1. Conceptual Framework.

3. Research Methodology

3.1. Research Design

This study adopts a qualitative case study design to explore the potential of agro-tourism in reducing tourism leakage and enhancing economic retention in Diebu County, China. A qualitative approach is appropriate for understanding complex social phenomena within their real-life context, especially where human experiences, perceptions, and local dynamics are central to the research aim^[37,38]. Case study methodology is particularly effective in situations where in-depth, contextual analysis is needed, and where the researcher seeks to explore “how” and “why” questions^[13]. Given the limited existing research on tourism-agriculture linkages in western China, this approach enables detailed exploration of local stakeholder experiences^[12,16].

Importantly, this research design is theory-driven. It is informed by three interrelated theoretical frameworks: Sustainable Rural Livelihoods, Embeddedness Theory, and Tourism Value Chain Theory^[14,22,27]. These frameworks collectively shaped the formulation of research questions, the structure of interview protocols, and the thematic interpretation of findings. The integration of theory throughout the research design ensures that empirical observations are not merely descriptive, but critically analyzed within broader conceptual discussions on rural development, economic retention, and tourism-agriculture integration.

To enhance the methodological rigor of the study, multiple data sources were employed, including semi-structured interviews, field observations, and document

analysis. Additionally, perspectives from diverse stakeholder groups were incorporated to ensure triangulation and improve the credibility and richness of the data. While qualitative research is inherently interpretive and context-bound, the study acknowledges potential limitations such as researcher bias, subjectivity in analysis, and limited generalizability. These concerns were addressed through careful methodological practices, including reflective field notes, member checking (where feasible), and maintaining a transparent audit trail of coding and interpretation procedures. The entire research process is outlined in **Figure 2**, which illustrates the sequence of steps from theoretical grounding and research design to data collection, thematic analysis, and result synthesis.

3.2. Study Site: Diebu County

Diebu County is located in Gansu Province in western China as shown in **Figure 3**. It is characterized by mountainous landscapes, ecological diversity, and a strong Tibetan cultural presence^[10]. Although classified as a poverty-alleviation zone in national policy, it has been included in targeted development programs under China’s rural revitalization and ecological protection strategies^[11]. In recent years, tourism initiatives, particularly eco-tourism and cultural heritage tourism that have increased Diebu visibility as a rural tourism destination, leveraging its unique natural and ethnic resources^[12]. However, the accommodations sector remains dependent on external goods and services due to fragmented local supply chains and weak agricultural integration, which results in limited economic retention^[5,6].

3.3. Participant Selection

To capture diverse and multi-level insights into the interface between rural tourism and agriculture in Diebu County, this study employed purposive sampling, a method widely used in qualitative research to recruit participants with direct, context-specific experience relevant to the research focus^[39,40]. A total of 15 participants were selected from three tourism-focused townships in Diebu County, ensuring both geographic and professional diversity. The sample comprised seven accommodation providers (homestay owners, boutique hotel operators, and inn managers), four community leaders (village heads, cooperative organizers), and four government officials from tourism and agricultural departments^[12,13]. This stratified sample design aligns with best practices in qualitative case studies, where cross-stakeholder representation enhances the richness and validity of data through triangulation^[12,13].

3.4. Data Collection

Primary data for this study were collected through semi-structured, in-depth interviews—a method particularly effective in qualitative research focused on understanding participant experiences, meanings, and local interpretations of social phenomena^[41]. This approach enables researchers to maintain a guided conversation while allowing flexibility for participants to elaborate on themes they perceive as important^[42]. All interviews were conducted in Mandarin Chinese, with interpretation provided for Tibetan dialects where necessary. Interviews lasted between 30 to 60 minutes and were recorded with participant consent for transcription and analysis^[39,40].

The interview guide was developed to reflect both empirical concerns and theoretical constructs derived from tourism value chain theory^[14] and rural livelihood frameworks^[22]. Key topics explored the interaction between tourism and agriculture in rural economies, with a focus on identifying gaps leading to tourism leakage.

Main areas of inquiry included:

- (1) **Current procurement practices:** How accommodation providers source goods, particularly food and daily supplies, and whether local agricultural producers are included in their supply chains^[14].
- (2) **Perceptions of tourism leakage:** Stakeholder conceptualizations of economic loss and unrealized potential^[5,6].
- (3) **Attitudes toward local sourcing:** Trust, reliability, and quality perceptions influencing procurement decisions^[27].
- (4) **Suggestions for strengthening linkages:** Policy changes, training, or organizational support needed to integrate agriculture into tourism^[29,30].

To enhance data validity, field observations were conducted at local hotels, marketplaces, and agricultural areas. These observations focused on visible sourcing behaviors, availability of local products, and informal supply chain interactions^[43]. Observational data triangulated interview findings, strengthening the study's trustworthiness^[44].

3.5. Data Analysis

The collected data were analyzed using thematic analysis, a widely adopted method in qualitative research for identifying, organizing, and interpreting patterns within textual data^[45]. As illustrated in **Figure 4**, the analysis followed six systematic steps: (1) familiarization through immersion in interview transcripts and field notes; (2) initial coding by inductively generating codes from participant narratives (e.g., “supply inconsistency” or “social embeddedness”); (3) theme development by grouping related codes into broader themes (e.g., “structural barriers” or “informal cooperation”)^[45]; (4) reviewing themes to ensure coherence and alignment with the research questions^[37]; (5) defining and naming themes to capture their core essence (e.g., “trust-based collaboration”); and (6) reporting the results through a synthesized and structured narrative^[38].

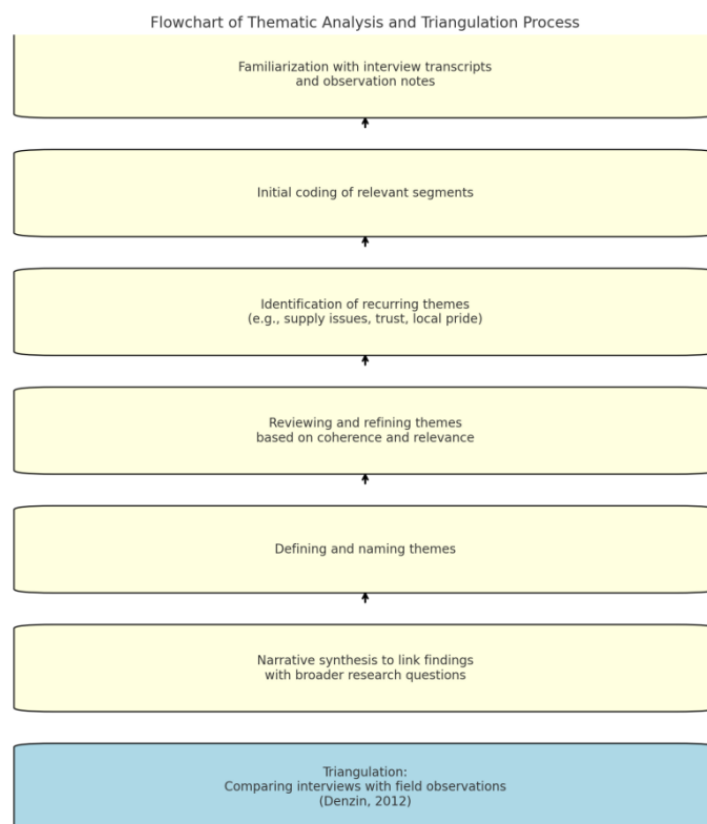


Figure 4. Thematic Analysis and Triangulation Process.

Manual coding was employed to maintain deep engagement with the data and to allow themes to emerge inductively. To enhance the credibility and trustworthiness of the findings, triangulation was applied by comparing interview data with field observations^[43,44]. For instance, when R1 (a homestay owner) stated, “We don’t have a contract or anything; it’s based on trust,” this was coded under the theme “social embeddedness,” as it reflects reliance on informal, trust-based relationships over formal agreements. Similarly, the statement, “Sometimes we can supply vegetables, but during winter, we rely on what’s imported,” was categorized under the theme “supply inconsistency,” highlighting the seasonal variability in local procurement. Moreover, the study adhered to the principle of theoretical saturation^[27]. Data collection ceased after 12 interviews when no new themes emerged, indicating that saturation had been reached. To further validate the thematic stability, three additional interviews were conducted, which confirmed the consistency of the identified themes and strengthened the reliability of the analytical results^[39].

4. Results and Discussion

4.1. Profile of Respondents

To ensure a comprehensive and multi-stakeholder perspective, this study interviewed 15 participants across three main groups: accommodation providers, local community leaders, and government tourism officials. Participants were selected using purposive sampling based on their direct engagement with rural tourism or agricultural development in Diebu County. More specifically, respondents comprised 7 accommodation providers, including homestay owners, boutique hotel operators, and inn managers, who represent the tourism supply side. Bedside, 4 community leaders, such as village heads, cooperative organizers, and local facilitators were included to reflect grassroots governance and agricultural perspectives. Additionally, 4 government officials from tourism and agricultural departments were interviewed to capture institutional and policy-level viewpoints. **Table 2** below provides an overview of each respondent background, role, organization, working experience,

rience, and educational training. The diversity in professional backgrounds ranging from homestay hosts with vocational training to government officials with master de-

grees enabled the study to capture rich, context-specific insights into both systemic challenges and local innovation in agro-tourism development.

Table 2. Profile of Respondents ($n = 15$).

Respondent No.	Stakeholder Group	Role	Hotel/Organization
R1	Accommodation Provider	Homestay Owner	Snow Peak Homestay
R2	Accommodation Provider	Hotel Manager	Diebu Eco Lodge
R3	Government Official	Tourism Bureau Staff	Diebu Tourism Bureau
R4	Community Leader	Village Head	Langmusi Village
R5	Accommodation Provider	Guesthouse Owner	Tibetan Guesthouse
R6	Community Leader	Cooperative Organizer	Green Fields Coop
R7	Accommodation Provider	Family-Run Inn Owner	Mountain View Inn
R8	Government Official	Tourism Officer	Gansu Tourism Dept
R9	Accommodation Provider	Boutique Hotel Owner	Valley View Boutique
R10	Community Leader	Village Committee Member	Niru Village Committee
R11	Accommodation Provider	Homestay Host	Highland Stay
R12	Government Official	Rural Tourism Planner	Cultural Tourism Office
R13	Community Leader	Community Facilitator	Agricultural Support Unit
R14	Accommodation Provider	Lodge Manager	Forest Edge Lodge
R15	Government Official	County Tourism Official	Local Tourism Office

4.2. Key Findings

4.2.1. Strong Interest in Local Sourcing

A consistent theme across interviews was the strong interest in procuring agricultural products locally. Most accommodation providers expressed a desire to purchase food supplies such as vegetables, eggs, and yak meat from nearby farmers. As R2 (Hotel Manager, Diebu Eco Lodge) explained:

"We prefer to buy from local farmers it cheaper, fresher, and guests enjoy the story behind the food."

Similarly, R5 (Guesthouse Owner) noted the marketing value of highlighting local ingredients, which resonates with tourists seeking authenticity. This finding aligns with the tourism value chain framework, where backward linkages (i.e., local sourcing) can improve income retention and add cultural value to the tourism product^[14].

4.2.2. Structural Barriers to Implementation

Despite enthusiasm for local integration, several constraints prevent tourism businesses from establishing consistent relationships with local agricultural pro-

ducers:

Supply Inconsistency: R4 (Village Head, Langmusi Village) shared that smallholder farmers cannot guarantee quantity or year-round availability. R10 added,

"Sometimes we can supply vegetables, but during winter, we rely on what imported."

Lack of Coordination: R3 (Tourism Bureau Staff) highlighted the absence of cooperatives or distribution mechanisms that could link hotels with multiple small-scale farmers^[8].

Infrastructure Deficiencies: R8 and R11 mentioned the lack of cold storage, packaging materials, and transportation facilities as major reasons for relying on wholesalers from outside the county^[12].

Policy Gaps: R13 (Community Facilitator) emphasized that there are few government initiatives that support agro-tourism value chains:

"Tourism and agriculture are still treated as separate things."

These findings reflect constraints in both the physical and institutional environment, consistent with broader rural development challenges in western China^[29].

4.2.3. Informal, Embedded Farm-to-Table Practices

While formal integration is limited, several respondents described informal sourcing arrangements. R1 (Homestay Owner) shared that she sources eggs and seasonal produce from a neighbor's farm:

"We don't have a contract or anything it based on trust. If she has it, I take it."

This trust-based collaboration echoes Embeddedness Theory (Granovetter, 1985), where social ties replace formal institutions. These informal arrangements are flexible and adaptive but remain vulnerable to supply fluctuations, labor shortages, and lack of scalability^[27,30].

4.2.4. Missed Opportunities and Failed Formalization Attempts

In contrast to the promising examples of informal procurement, several participants referenced past efforts to formalize cooperation between local farmers and accommodations that failed. For instance, R6 (Cooperative Organizer) noted that a pilot cooperative formed in 2021 disbanded within one season due to disagreements over pricing and lack of delivery logistics:

"Some members didn't want to commit to delivery schedules, and others thought the prices offered by hotels were too low."

These failed attempts point to structural tensions between farmer expectations and tourism business models, underscoring the need for negotiated standards, capacity building, and shared logistics to sustain formalized agro-tourism partnerships. Including these contrary cases helps highlight the limitations of informal systems and the complex institutional work required to scale them^[21,34].

4.2.5. Visual Summary of Interview Themes

To illustrate the distribution of these findings across participants, the figure below presents the frequency with which each core theme appeared across interviews.

The **Figure 5** shows that interest in local sourcing was the most widely discussed theme, followed by concerns about supply inconsistency, coordination issues, and infrastructure gaps. While informal sourcing relationships were mentioned by fewer respondents, they represent key opportunities for deepening integration through trust and social capital.

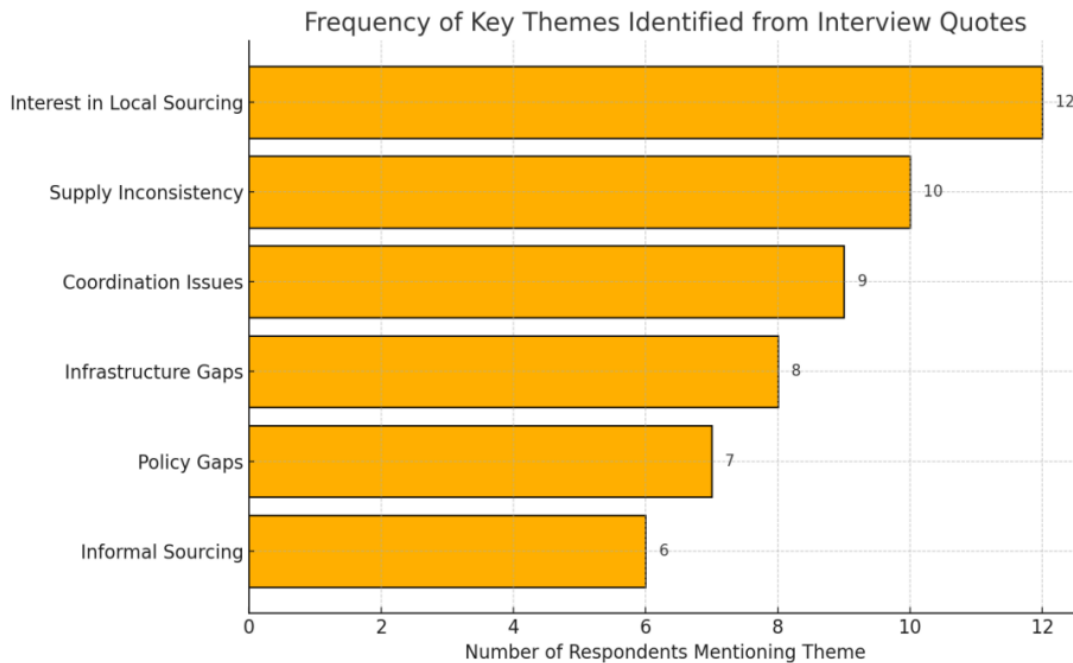


Figure 5. Frequency of Key Themes Identified from Interview Quotes (n = 15 respondents).

4.3. Discussion

The findings of this study align closely with the integrated conceptual framework, demonstrating how theoretical models can illuminate the complex dynamics of tourism-agriculture integration in remote, ethnically diverse rural regions. The Sustainable Rural Livelihoods framework^[22] illustrates that agro-tourism offers a valuable avenue for income diversification, particularly in areas with limited non-farm employment. However, these potential benefits are significantly constrained by structural challenges such as seasonal supply inconsistencies, insufficient infrastructure, and market disconnection—challenges that are characteristic of underdeveloped rural contexts like Diebu County^[5,6].

Moreover, Embeddedness Theory^[27] deepens this understanding by highlighting the importance of informal, trust-based relationships in facilitating local procurement. In the absence of formal supply chains, these social ties serve as critical mechanisms for sourcing agricultural goods locally. Yet, while they provide a foundation for cooperation, they also limit scalability and formalization^[27,30]. Tourism Value Chain Theory^[14] complements this perspective by identifying the accommodation sector as a key leverage point for improving local economic retention—an area often overlooked in policy but central to backward linkages with agriculture^[14,29].

These theoretical insights are corroborated by comparative evidence from other contexts. For instance, in Bali, high leakage rates in chain hotels were linked to reliance on imported goods, whereas locally owned accommodations maintained stronger ties with local producers^[6]. Similarly, in Northern Thailand, Lacher and Nepal^[8] demonstrated that community-driven tourism and direct sourcing arrangements between farmers and tourism providers significantly reduced leakage and increased household incomes. These cases reinforce the idea that successful agro-tourism integration requires more than market access—it depends on capacity-building, institutional support, and policy alignment, all of which remain underdeveloped in Diebu^[14,29].

Beyond structural and institutional challenges, cultural dynamics also play a critical role. Tibetan farming practices in Diebu are deeply embedded in seasonal and

ritual calendars, which may not align with the rigid demands of the tourism supply chain. Participants in this study noted that religious festivals or communal labor cycles can delay harvests and deliveries, creating asynchronous rhythms between agricultural production and hotel procurement needs^[11,27]. Recognizing these culturally specific practices enhances our theoretical understanding of embeddedness and livelihood strategies in highland ethnic minority regions, where economic decisions are often inseparable from social and spiritual systems^[11,22].

From a practical standpoint, this study reveals clear pathways for policy and programmatic intervention. To reduce leakage and scale agro-tourism as a viable rural development model, four key actions are recommended:

- (1) Formation of producer cooperatives or centralized food hubs to improve consistency, coordination, and bargaining power for smallholder farmers^[30,34].
- (2) Investment in cold storage and transportation infrastructure—potentially through public-private partnerships—to extend seasonal availability and reduce spoilage^[12,19].
- (3) Pilot contract farming schemes between hotels and local producers to build mutual predictability and trust for gradual formalization^[8,14].
- (4) Integration of agro-tourism into local development plans to institutionalize support mechanisms and shift from informal exchanges to semi-formal supply chains^[22,29].

In summary, this research contributes theoretically by integrating livelihoods^[22], embeddedness^[27], and value chain^[14] perspectives to explain tourism-agriculture linkages in a real-world rural Chinese context. It contributes practically by identifying actionable levers—organizational, infrastructural, and policy-based that can transform agro-tourism from a promising concept into a scalable, sustainable development strategy^[3,12]. These insights are not only applicable to Diebu but offer a replicable framework for similarly positioned rural areas facing economic leakage and underutilized agricultural assets^[34,44].

5. Conclusions

This study explored the potential for agro-tourism to reduce tourism leakage and enhance economic retention in Diebu County, China. Using a qualitative approach based on 15 in-depth interviews and field observations, the research centered on the perspectives of accommodation providers, community leaders, and tourism officials. The findings reveal strong stakeholder interest in sourcing agricultural products locally as part of the rural tourism experience. However, this aspiration remains largely unrealized due to persistent systemic barriers including inconsistent supply, limited producer coordination, inadequate infrastructure, and insufficient policy integration.

These findings are well-supported by the study's integrated conceptual framework. The Sustainable Rural Livelihoods approach underscored agro-tourism's role in income diversification and resilience-building for rural households. Embeddedness Theory revealed how social capital, trust, and informal networks support nascent farm-to-table linkages, even in the absence of formal institutions. The Tourism Value Chain perspective identified the accommodations sector as a strategic entry point for deepening local economic engagement through backward linkages to agriculture. Together, these theoretical lenses provided a nuanced understanding of both structural constraints and relational dynamics in shaping tourism-agriculture integration.

Yet, the study is not without limitations. The positionality of the researcher as an external observer with limited linguistic and cultural fluency in the Tibetan communities of Diebu may have affected both the depth of disclosure from participants and the interpretation of subtle socio-cultural cues. While translation support and rapport-building efforts were employed, these measures may not fully offset the outsider effect. Future studies could address this limitation by engaging local co-researchers, employing participatory methods, or incorporating longitudinal observation to enhance cultural immersion and analytic depth.

In conclusion, agro-tourism presents a promising pathway for inclusive rural development in Diebu County. However, harnessing its full potential will require multi-level coordination. Critical steps include upgrading in-

frastructure, strengthening producer networks, and integrating agricultural and tourism policies to support localized value chains. By highlighting both the promise and the practical hurdles of tourism-agriculture linkages, this study contributes to the broader discourse on sustainable rural development and offers a contextually grounded, theoretically informed model that can inform similar initiatives in other underdeveloped or ethnically diverse regions.

Author Contributions

Conceptualization, L.Z. and S.I.O.; methodology, L.Z.; software, L.Z.; validation, L.Z. and S.I.O.; formal analysis, L.Z.; investigation, L.Z.; resources, L.Z.; data curation, L.Z.; writing—original draft preparation, L.Z.; writing—review and editing, S.I.O.; visualization, L.Z.; supervision, S.I.O.; project administration, L.Z.; funding acquisition, S.I.O. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

Ethical review and approval were waived for this study due to the non-invasive and low-risk nature of the qualitative interviews. All participants were adults and voluntarily participated after being informed of the study's purpose, procedures, and confidentiality measures.

Informed Consent Statement

Written informed consent has been obtained from the patients to publish this paper.

Data Availability Statement

The data supporting the findings of this study are not publicly available due to privacy and confidentiality concerns of the interview participants. Anonymized ex-

cerpts may be provided upon reasonable request to the corresponding author.

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Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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