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Silver on the mountain: Value chain of Morchella spp in Nepal

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Abstract

Non-timber forest products (NTFPs) contribute significantly to both local and international economies through market and nonmarket channels. In Nepal, NTFPs provide a vital income source, particularly in mountainous regions, with an annual trade value of around 25 million Nepalese Rupees. Among these, *Morchella spp.* (Morels) is highly valued for its diverse uses. Despite its economic and environmental benefits, a detailed analysis of Morels collection and trade systems has been lacking.

This study examines the structure of Morels value chains (VCs) across 15 districts, covering Nepal's High Mountains, Middle Hills, and Terai regions in each development zone. Data were gathered through 86 in-depth interviews with VC actors, validated by direct observation, 15 group discussions, and 45 expert interviews.

Results revealed four main actor groups—collectors, traders, central wholesalers, and regional wholesalers—who drive the Morels VCs, supported by institutional actors like the District Forest Department (DFO) and Community Forest User Group (CFUG). Governance was buyer-dominated, with limited horizontal coordination between stakeholders, reducing the potential for value capture. Recommendations for improving the efficiency of Morels VCs are also provided.

Keywords: wild edible fungi, value chain configuration, governance nodes, stakeholders, value chain upgrading.

Introduction

Approximately Around three-quarters of the poor in developing countries reside in rural areas, relying heavily on natural resources for livelihood and income (Chen et al., 2007; Barbier, 2010). Forests play a key role in supporting human well-being (Pandey et al., 2016) by (i) meeting consumption needs, (ii) providing safety nets during shocks, and (iii) enabling asset accumulation for poverty reduction (Angelsen et al., 2003; Vedeld et al., 2007). Non-timber forest products (NTFPs) contribute significantly to these functions but remain debated in terms of their role in gap filling, as safety nets, and in poverty reduction. For instance, NTFPs serve as safety nets for 70% of rural households in South Africa (Hunter et al., 2011), though only occasionally offer poverty escape, as seen with shea nuts in Burkina Faso and medicinal plants in Nepal.

Among NTFPs, commercial trade in wild fungi is a vital income source globally (Yang et al., 2008). While wild mushrooms hold potential as a "pathway out of poverty," data on income from fungal collection remain scarce. Recent studies (De RomÁn et al., 2006; Pouliot et al., 2018) have mapped fungi value chain structures, but research is limited. This study aims to address this

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gap by examining the value chain characteristic of Morel, a high value mushroom in Nepal, to contribute to the knowledge bank of the mushroom commercialization.

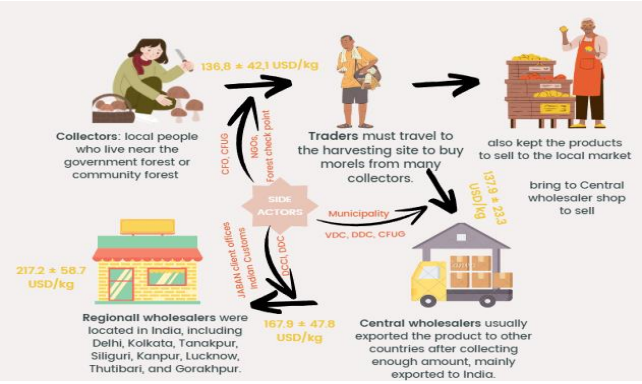
Material and Methods

Qualitative and quantitative methods were used to collect primary and secondary data. Secondary data provided an overview of the study areas and morel production and consumption in Nepal. Primary data, gathered from mid-April 2014 to mid-April 2015, included 86 in-depth interviews, 15 group discussions, 45 expert interviews, and direct observations. Qualitative data were coded, categorized, and analyzed to identify themes and relationships, while descriptive statistics, such as ANOVA, assessed the socio-economic attributes of actors in the morels value chain.

Results and Discussion

Map of Morel's value chain

Figure 1 shows a general map of Morels VCs in Nepal demonstrating key stakeholders, markets and relevant value links. The Morels VCs involved four main direct actor groups including collectors, traders, central wholesalers, and regional wholesalers. Additionally, different side actors, such as the District Forest Department (DFO) and Community Forest User Group (CFUG) provided support and facilities for the VC performance.



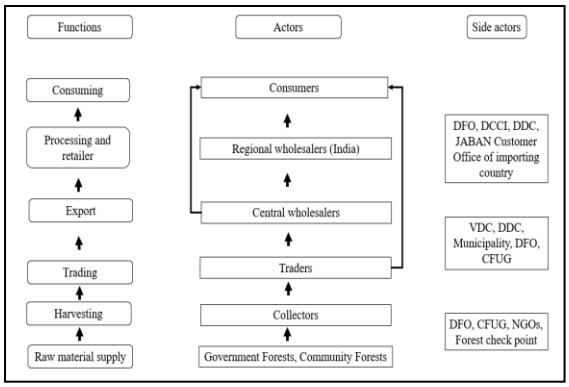


Figure1: Morel value chain map

Chain actor's anatomy

Stakeholders participated in the Morels VCs to different extents. An overview of the socio-economic characteristic of key actors in the morels VC is presented in **Error! Reference source not found.**.

Table 1: Morel value chain actors and their socio-economic background

Characteristics	Harvesters	Traders	Central wholesaler	Regional wholesalers
	n=14	n=35	n=6	n=31
Age	31.4±2.6	41.3±1.7	45±3.2	47.7±2.3
Sex				
Female	28,6	2,9	16,7	3,2
Male	71,4	97,1	83,3	96,8
Experience (years)	7.3±1.0	12.9±1.5	17.3±3.5	22.7±2.4
Household size (people)	7,6±1,3			
Household cash income (Rps)	348214±114458			
Share MAPs income (%)		80,1±4,8		
Share Morels income (%)		6,66		
Permanent employees (people)			6±1	100±97
Temporary employees (people)		2±1	14±3	71±64

Morel's collectors

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Morel collectors, primarily Chhetri, Bhote, Thakuri, and Brahman from Village Development Committee (VDC) villages, traveled on foot to collection sites. About half were from the Chhetri caste, a social group generally less educated than Brahman and Thakuri. Over 70% of collectors were middle-aged men with an average of 7 years of experience. Households averaged 7.6 members, with 62% involved in collecting. Children rarely participated, and three-quarters of collectors had limited education, often below secondary school. Financially, most collectors were stable, with only 14.3% identifying as below-average wealth. Over half considered morel collection a primary livelihood, while others combined it with activities like livestock grazing or collecting other medicinal and aromatic plants (MAPs). Income from morels contributed only 6.6% to annual household income, far less than the 80% from total MAPs activities. Collectors typically spent 10 days gathering morels, with a range of 4 to 23 days.

Morels traders

Traders typically rent locations to store morels, maintaining relationships with collectors through social networks and trust. Most traders (88.6%) purchase morels directly at collection sites, although some buy from other traders or directly from collectors who visit their shops. Products are stored locally before being transported to major markets in Kathmandu, Banke, Humla, Darchula, and across the Chinese border in Taklakot and Nyingchi. Each trader typically sources from around 300 collectors. Nearly half of the traders are Chhetri, with greater ethnic diversity than collectors. Traders are, on average, ten years older and better educated than collectors, with an average age of 41 and 13 years of experience in medicinal and aromatic plant (MAP) trading. About 70% have been in the morels trade for over five years, longer than collectors (t-test, $p = 0.0279$). For local specialists, MAPs trade is the primary income, while generalists diversify with goods like food or tobacco, or with additional income sources like agriculture or wages, with MAPs providing around 65% of annual income. Traders employ no permanent staff but typically hire two temporary workers per season.

Morels central wholesalers

Central wholesalers of morels differed slightly, with a higher proportion of women workers (16.7%) and an average age of 45, older than both harvesters and traders. They averaged 17 years of trading experience, though this was not significantly higher than traders' experience (t-test, $p = 0.265$). Wholesalers generally had higher educational backgrounds, with at least a small learning community (SLC) level, and 33.3% held graduate-level qualifications or higher. While predominantly Chhetri, they represented diverse castes, including Brahman Hill, Brahman Tarai, Marwadi, and Sherpa. A typical central wholesaler employed about six permanent and fourteen temporary workers. There were two types: generalist wholesalers (67%), who diversified into goods like food, ghee, and tourist or business consulting, and specialist wholesalers (33%), focused solely on medicinal and aromatic plants. Generalists had over 18 years of experience, with MAPs making up about 67% of their business, while specialists had slightly less experience at 15 years.

Morels regional wholesalers

In the morels value chain, regional wholesalers were based in India (Delhi, Kolkata, Tanakpur, Siliguri, Kanpur, Lucknow, Thutibari, and Gorakhpur) and were the oldest participants, averaging 48 years in age and over 22 years of trading experience, often starting young. The group was predominantly male (97%), and nearly 42% had higher education, with 29% holding a graduate-level education, and only 3.2% had less than secondary education. Most regional wholesalers (90%) owned their firms, and 77% traded exclusively in medicinal and aromatic plants (MAPs), while 23% diversified with products like food, cosmetics, and dry fruits. Due to their larger operations, regional wholesalers typically employed about six permanent and four temporary

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workers. A single large processing and commission wholesaler employed approximately 3,000 permanent and 2,000 temporary workers, likely due to labor-intensive processing activities.

Institutional actors

The The collection and trade of morels are governed by an institutional system at local and national levels, where regulatory bodies either support or regulate value chain (VC) operations. Sustainable collection and royalty management are overseen by the District Forest Office (DFO) and Community Forest User Groups (CFUG), while product checking and endorsements occur at range posts and forest checkpoints. For exports, the DFO recommends products to customs, and the Department of Plant Resources (DPR) grants export permissions for processed goods. Market information is provided by the District Chamber of Commerce and Industry (DCCI) and the Asia Network for Sustainable Agriculture and Bioresources (ANSAB), with resource management and research led by DPR, DFO, and NGOs. Local taxes are collected by Village Development Committees (VDC), District Development Committees (DDC), and municipalities, and transit permits are issued by the DFO. Import permissions are managed by JABAN and customs offices in importing countries, such as Indian Customs at the Siliguri border, while export duties fall under the Nepalese Customs Office and the Inland Revenue Department.

The DFO, the leading local authority in forest-based industries, plays a central role in facilitating VC operations, especially at the start-up level. The DFO range post has the power to enforce fines for unsustainable harvesting by CFUGs. Other key facilitators include CFUG, NGOs, forest checkpoints, VDC, DDC, and municipalities, with additional support from DCCI, JABAN, and Indian Customs in the export process.

Conclusions and Outlook

There were four actor groups including collectors, traders, central wholesalers and regional wholesalers. Various institutional actors provided support and facilities for the VC performance. Vertically, the buyers had the upper hand in almost all transactions along the chains. Lack of horizontal coordination between stakeholders despite its importance in capturing the added value created. Recommendations referring to the improvement of morels VCs were delineated, including: (i) improving harvesting techniques; (ii) enhancing post-harvest processing; (iii) strengthening market access, (iv) adding value through product diversification; (v) empowering local communities; (vi) leveraging technology; (vii) policy support and advocacy.

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