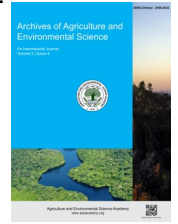This content is available online at AESA

Archives of Agriculture and Environmental Science

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ORIGINAL RESEARCH ARTICLE

CrossMark

Production economics and marketing of Himalayan Yew in Mahankal rural municipality of Lalitpur District, Nepal

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ABSTRACT

This study delves into the dynamic landscape of Himalayan yew cultivation in the Mahankal Rural Municipality of Lalitpur district, offering a comprehensive analysis of the socio-demographic factors influencing growers' practices. By examining variables such as gender, age, education, landholding, income, ethnicity, access to irrigation facilities, and marketing strategies, we present a nuanced understanding of the complexities involved. Agriculture emerges as the cornerstone of respondents' income, with Himalayan yew cultivation consistently proving to be financially lucrative, yielding revenues and gross margins that significantly bolster local farmers' economic well-being. The calculated Benefit-Cost Ratio underscores the profitability of Himalayan yew cultivation in Mahankal, advocating for its sustained expansion. Despite favorable climatic conditions, challenges persist in marketing and production domains. Limited primary marketing channels signify untapped potential, necessitating initiatives to foster growth and enhance efficiency. Technical obstacles highlight the need for innovative solutions and technical support to bolster the sustainability of Himalayan yew cultivation. In conclusion, this research underscores the promising prospects and profitability of Himalayan yew cultivation while emphasizing the imperative to address existing challenges. Strategic interventions and collaborative efforts are essential to empower local farmers and ensure the enduring success of this valuable industry. This study serves as a clarion call for concerted action to propel Himalayan yew cultivation to new heights in Mahankal and beyond.

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INTRODUCTION

Nepal's abundant wealth of medicinal plants and herbs is widely acknowledged. In the context of Asian nations, Nepal holds the impressive ninth position, boasting a diverse array of approximately 9,000 species of flowering plants (Bhattrai *et al.*, 2011). Medicinal plants serve as vital remedies in areas where access to formal healthcare services is limited. Particularly in the Himalayan region, these plants have emerged as a significant source of income for local communities. Nepal boasts a wealth of medicinal herbs, with numerous valuable species like *Ocimum sanctum* (tulsi), *Elaeocarpus sphaericus* (Rudraksha), *Ficus religiosa*

(Peepal), and *Desmostachya bipinnate* (Kush) thriving within its borders. Among these, *Taxus wallichiana*, locally known as Lauth salla, holds a special place as one of Nepal's most crucial and high-value medicinal plants. It is currently classified as an endangered species by the International Union for Conservation of Nature (IUCN, Red List of Threatened Species, 2011). The endangerment of this species primarily stems from challenges related to limited seed production and delayed germination. Additionally, illegal cutting of its parts poses a significant threat. If the trends of overgrazing and increased cutting persist, there is a genuine risk of this species becoming extinct. Consequently, it is imperative to implement conserva-

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tion measures. Biotechnological techniques, such as vegetative propagation and in-vitro regeneration, can be applied in controlled environments like nurseries and laboratories to generate a substantial number of robust, young plants. Alongside these efforts, both in-situ and ex-situ conservation and management approaches should be employed. Furthermore, it is crucial to involve local communities in large-scale reforestation initiatives. Yew is a versatile species that displays evergreen, coniferous, and deciduous characteristics. It thrives within a wide range of altitudes, typically found at elevations ranging from 900 meters to 3700 meters above sea level, as documented by ICIMOD ((ICIMOD), 2021). This species exhibits adaptability to various habitat types, including montane, temperate, warm temperate, and tropical sub-montane to high montane forests. In densely forested environments, it tends to adopt a low canopy tree form, whereas in open areas, it often assumes a sprawling and expansive shrub-like growth pattern. It is employed as a remedy for hypertension and is renowned for containing taxol in its bark, needles, and leaves. This plant is highly sought after and holds diverse applications in traditional medicine. The taxol found in the plant's shoots and leaves is believed to possess anti-cancer properties and is utilized in the treatment of conditions such as breast, ovarian, and lung cancer, among others. Additionally, herbal tea is crafted from its leaves, which contain a chemical known as 10-Deacetylbaccatin, recognized for its anti-cancer attributes. The Himalayan yew has a historical legacy as a traditional remedy for ailments related to the digestive, respiratory, nervous, and skeletal systems (Sharma & Garg, 2015). It finds application in the treatment of a range of conditions, including diphtheria, coughs, inflamed tonsils (tonsillitis), muscle and joint discomfort, as well as tapeworm infestations. It possesses antioxidant, antimicrobial, and cytotoxic attributes, making it a potential reservoir of innovative pharmaceutical compounds (Gauchan *et al.*, 2020). Extracts derived from different components of the Yew plant have the potential to address diverse health issues, including pain, fever, inflammation, fungal and bacterial infections, cancer, and convulsions (Juyal *et al.*, 2014). It is said to have emmenagogue and antispasmodic properties which are used for the treatment of hysteria, epilepsy, and nervousness.

The demand for Himalayan yew is evident not only in various regions of Nepal but also notably in the bustling Kathmandu Valley. In the Annual demands of herbs/essential oils for the year 2060/61 in Kathmandu Valley, Himalayan yew was listed under the trade name "Loth Salla," with the specified plant part for use being the leaf. The demand for Himalayan yew during that period was recorded at a substantial 350,200 kg (Tiwari *et al.*, 2004). The plant is gaining increasing recognition for its significance, with a growing demand observed over time. It holds the distinction of being the top Non-Timber Forest Product (NTFP) in the Kathmandu Valley, with an annual demand exceeding 1,000 kg. Moreover, it has earned a place on the national priority list of herbs, highlighting its importance in conservation and sustainable utilization. This acknowledgment underscores the need for responsible harvesting and conservation

efforts to ensure the long-term survival of the Himalayan yew and other valuable plant species (Tiwari *et al.*, 2004). The Himalayan yew is emerging as a noteworthy product in Lalitpur district, with several farmers actively involved in its cultivation. The local climatic conditions are conducive to the growth of this plant. In the Lalitpur district, specifically, *Taxus wallichiana var. mairei* is the cultivated variety of *Taxus wallichiana*, which is being cultivated. In the picturesque Lalitpur district, *Taxus wallichiana var. mairei* thrives across a potential habitat area spanning 2,579 hectares, where an average of 10 majestic specimens per hectare graces the landscape, collectively contributing to a substantial biomass of 4,280.6 kg per hectare. Conservation efforts are guided by a sustainable harvest limit of 951.2 kg per hectare, ensuring the preservation of this valuable species for generations to come ((DPR), 2078).

The cultivation and trade of Himalayan yew present both opportunities and challenges, particularly in Lalitpur district, Nepal. While the plant's medicinal properties offer potential economic benefits to local communities, there remains a gap in understanding the socio-economic dynamics and conservation strategies related to its cultivation in this region.

This study aims to address this gap by conducting a comprehensive analysis of the production and marketing aspects of Himalayan yew in Lalitpur district. By examining the socio-economic status of respondents, production costs, profitability, marketing strategies, and constraints faced by farmers, this research seeks to provide valuable insights into the economics of Himalayan yew cultivation and its significance for local livelihoods.

The significance of this work lies in its potential to inform policymakers, researchers, governmental and non-governmental organizations, and local communities about the economic and conservation implications of Himalayan yew cultivation. By identifying key challenges and opportunities, this research aims to contribute to the development of sustainable management strategies for Himalayan yew cultivation in Lalitpur district and beyond. In essence, this study aims to shed light on the socioeconomic dimensions of Himalayan yew cultivation, highlighting its importance for local livelihoods and conservation efforts. Through a nuanced analysis of the production and marketing dynamics, this research seeks to provide actionable insights for promoting sustainable practices and ensuring the long-term viability of Himalayan yew cultivation in Nepal.

MATERIALS AND METHODS

Research site

The research took place in Lalitpur district, Nepal, which is located in the Bagmati province. This district, with its administrative center in Lalitpur, covers an area of 396.92 square kilometers. In Lalitpur district, major crops cultivated include black gram, maize, sesamum, soybean, groundnut, mung bean, wheat, field pea, chickpea, lentil, and mustard. Additionally, the region has seen the emergence of cash crops like tea, coffee, and ginger, which are increasingly attracting attention in agriculture. Recently, farmers in Lalitpur district have diversified their

Figure 1. *Map of study area- Lalitpur, Nepal.*

agricultural practices by cultivating *Taxus wallichiana* on their farmlands, to generate income and provide employment opportunities. This specific study was conducted in the Mahankal Rural Municipality within the Lalitpur district, focusing on the analysis of production and marketing dynamics related to Himalayan yew (Figure 1).

Research design
To achieve the research objectives, researchers employed a survey research design, using household surveys, key informant interviews, and focus group discussions as the primary methods of data collection.

Preliminary field visits
Preliminary information about the field conditions, socio-cultural settings, demographic characteristics, and topographic features of the study area was gathered through frequent preliminary field visits conducted in the past. The data collected during these visits proved valuable for preparing interview schedules, designing the sampling framework, and applying sampling techniques. These preliminary field visits also played a crucial role in guiding the effective collection of data during the household survey.

Sample and sampling technique
Initially, a comprehensive list of various wards, each with its corresponding farmer group of Himalayan yew producers, was compiled. Subsequently, a subset of farmers was chosen from each group within the Himalayan yew-producing wards using the simple random sampling method. Following this, the selection of traders and retailers involved in the study was carried out.

Selection of yew farmers
The sampling frame was created by compiling a list of the farmers' names. The sample size was calculated using Slovin's Formula, which is expressed as: n=N/(1+Ne^2) (Baruwadi, Yulia Akib, & Bahua, 2020), where n is the sample size, N is the population size and e is the margin of error to be decided by the researcher. Out of 230 yew farmers, 70 farmers are selected as samples for the survey.

Primary data collection methods
Primary data were collected directly from farmers within the study area by using research instruments like household surveys, focus group discussions, key informant interviews, and field observations which are given below:

Household survey
A household survey involving 70 households was conducted through face-to-face interviews. The interviews were carried out using semi-structured pre-tested questionnaires. Specifically, Himalayan yew-growing farmers were selected as respondents for the primary data collection process. The preference was given to younger respondents to obtain more realistic, reliable, and comprehensive data. During the interviews, a range of questions were posed, covering various aspects including demographics, education, socio-cultural factors, behavioral patterns, economic aspects, and other relevant information about Himalayan yew production. These interviews were instrumental in gathering a thorough understanding of the subject matter.

Focus Group Discussion (FGDs)
Three focus group discussion sessions were conducted with farmers using an interview checklist as a guide. The insights and information gathered through these focus group discussions served a dual purpose. First, they complemented and verified the data collected during the household surveys, enhancing the overall reliability of the findings. Second, these discussions provided valuable insights into the rural dynamics and settings within the study area, contributing to a more comprehensive understanding of the research context.

Key Informants Interviews (KIIs)
Key stakeholders involved in yew production within the study area, such as local farmers and leaders, local extension workers (including forestry staff), heads of farmer groups and cooperatives, and heads of community-based organizations (CBOs), were identified as key informants. Interviews were conducted with these key informants using a structured interview checklist. The information gathered from these key informant interviews played a vital role in cross-verifying the data obtained from the household surveys, enhancing data accuracy and reliability.

Field observation and verification

Field observation was done at different times on the site to witness the situation which was assistive in validating the information obtained from the household survey.

Secondary data collection

Secondary data were collected by reviewing the following documents during the study to gain relevant information:

- Documents and publications of MOAD, NARC, and other government agencies.
- Reports and publications of various concerned NGOs and INGOs like FAO, UNDP, etc.
- Journal articles of AFU, TU, PU, and other reputed national and international universities and journals
- Websites and webpages of various reputed national and international agencies.

Data analysis techniques

The collected data underwent a meticulous process of refinement and organization before analysis. This involved coding and entry into both SPSS software and Excel spreadsheets. Subsequently, data analysis was conducted using SPSS and MS Excel software to derive meaningful insights and draw conclusions. The research findings were effectively visualized and presented through the use of tables, figures, bar diagrams, pie charts, and other graphical representations.

Functional forms of data analysis

The following steps are needed to analyze data:

Gross margin analysis

The difference between the gross return and the total cost incurred for any enterprise is known as the gross margin. It is the simplest and the quickest method for analyzing the farm business. The gross margin of the Himalayan yew in this study will be calculated using the following formulae:

Gross margin= Gross return – Total variable cost (Sapkota & Sapkota, 2019)
Where,
Gross return= Total marketed quantity * price per unit

Total cost= Fixed cost + Variable cost

Benefit-cost ratio

Benefit-Cost Ratio analysis was done after calculating the total cost and gross return from the yew production. The undiscounted benefit-cost ratio was estimated as a ratio of gross return and total variable cost.

Now, the Benefit-Cost Ratio was calculated using the following formulae:

Benefit-Cost Ratio (BCR) = Gross Return/Total costs (Sapkota & Sapkota, 2019)

Market margin

The difference between the farm-gate price and the retailer's price is the marketing margin which was calculated as follows:

- Marketing Margin= Retail Price – Farm-gate Price

- The retail price strongly dictates the wholesale to retail marketing margin (Shrestha, 2012).

Price spread

The price spread is defined as the difference between the price paid by consumers and the net price received by the producer for an equivalent quantity of farm produce. It is expressed as a percentage of the consumer's price.
Price spread= ((consumer price – net price of producer)/ consumer price) * 100

Producer's share

The price received by the farmers is expressed as a percentage of the retail price, that is (i.e.) the price paid by the consumers is called the producer's share. It can be calculated by using the following formulae:

Producer's share= (Pf/Pr)*100
Where,
Pf= Farm gate price
Pr= Retail price
Ps= Producer's share

RESULTS AND DISCUSSION

Production situation of Himalayan Yew

In a recent survey encompassing 70 households within the picturesque Mahankal Rural Municipality, a vivid portrait of Himalayan yew cultivation emerges. The findings reveal an astounding average of 69 Himalayan yew trees per ropani of land, with a noteworthy practice among most farmers of densely planting around 100 trees per ropani, often without adhering to recommended spacing guidelines. Moreover, the landowners, who possess an average of 16.44 ropani each, have wholeheartedly dedicated their entire land holdings to the cultivation of this prized tree, resulting in an impressive average land allocation of 11.31 ropani for farming. This localized dedication to Himalayan yew cultivation stands out, especially when considering the broader habitat suitability area for Taxus wallichiana in Lalitpur district, which is approximately 103.324 square kilometers (Gaire *et al.*, 2023). Agriculture reigns supreme as the principal occupation among the residents, complemented by endeavors in vegetable cultivation and livestock rearing, showcasing the community's diversified approach to livelihoods. The year's production, standing at an impressive 644.71 kg, reflects a significant surge from the previous year's yield of 517.36 kg, as illustrated in Table 1. In summary, Mahankal Rural Municipality stands as an exemplar of Himalayan yew cultivation, blending

Table 1. Production situation of Himalayan Yew in Mahankal Rural Municipality, Lalitpur

Particulars	Overall
Total number of Himalayan yew trees per ropani	4801
Average number of plants per ropani	69
Average land holding (in Ropani)	16.4
Average area under Himalayan yew cultivation (in Ropani)	11.3
Average current year production (in kg)	644.7
Average last year production (in kg)	517.3

Table 2. Total variable cost incurred in Himalayan yew production in Mahankal Rural Municipality, Lalitpur.

Particulars		Total (NPR per ropani)
Seedling cost		557844.3
Labor cost	Land Preparation	230236.3532
	Plantation	200093.0664
	Fertilization	331115.2159
	Harvesting	364320.03
Total Variable cost		1683608.982

economic potential, cultural significance, and sustainable practices in a harmonious tapestry that underscores the intricate relationship between tradition and modernity.

Cost of production

The tabulated data provided in Table 2 outlines the average cost of production per hectare, focusing exclusively on variable costs incurred throughout the year. These variable expenses encompass a range of critical factors, such as the cost of seedlings, manure, irrigation, labor, and transportation, as well as expenditures related to pesticides and herbicides. Notably, the variable costs within the study area are primarily attributed to seedling acquisition and labor expenses associated with land preparation, plantation, fertilization, and the crucial harvesting process. This data underscores the significance of understanding these variable costs as they play a pivotal role in assessing the overall economics of agricultural production within the region.

Benefit-Cost Analysis

Table 3 shows the economic analysis of Himalayan yew farming in study households.

The provided table offers a transparent overview of the financial aspects of Himalayan yew production, highlighting that the total variable cost amounts to NPR 1,683,608.982. In contrast, the gross return stands at a substantial NPR of 12,143,080, resulting in a BC ratio of 2.65. This ratio signifies that Himalayan yew production in the study area is notably profitable. Additionally, the gross margin, calculated at NPR 10,459,471.02, indicates the total revenue generated after deducting variable costs. Comparing the significant net income from Himalayan yew production, totaling NPR 7,556,721.018, to Lalitpur district's average earnings of $31,868.88 from coffee cultivation (Karki *et al.*, 2018) underscores the district's diverse income sources. With a benefit-cost ratio exceeding 1, this data underscores the economic viability and profitability of Himalayan yew cultivation within the study area.

Price spread

Price spread, in the context of agricultural products, represents the disparity between the price paid by consumers and the net price received by producers for a comparable quantity of farm produce. In the case of Himalayan yew, a distinctive feature of its market dynamics is its prohibition from being exported in its raw form. Consequently, to facilitate international exports, the product undergoes processing by specialized processors. This transformation process yields a striking ratio, where from every 1000 kg of raw Himalayan yew, only 1 kg of processed yew is obtained for export. This intricate supply chain illustrates the value addition that occurs during processing and the associated economic implications for both producers and consumers in the Himalayan yew market. The price spread seen from producer to consumer was 29.66%. i.e. NRs. 1,13,000 in terms of rupees, this is very high concerning the price spread of tomato which was NRs.32 per kg (Koirala *et al.*, 2022).

Market margin

The market margin analysis for Himalayan yew farming in Mahankal Rural Municipality, Lalitpur, reveals a retail price average of NPR 275 per kilogram, compared to an average farm gate price of NPR 268 per kilogram. This results in a marketing margin of NPR 7 per kilogram, representing the difference between retail and farm gate prices. A market margin of more than 50 implies that there is higher marketing efficiency. The market margin of the study area was found to be NRs. 7 per kg. The calculated marketing margin for tomatoes in the Lalitpur district amounted to Rs. 20 per kilogram (Choudhary, 2010) which was higher than for Yew.

Producer share

The producer share of the study area for yew is 97.45%, demonstrating a correlation between higher producer shares and enhanced marketing efficiency. This is consistent with the principle that a market is efficient when it maximizes both consumer and producer surplus. For instance, the producer's share of tomatoes in the study area accounted for 67% (Choudhary, 2010), serving as a comparative reference.

Table 3. Economic analysis of Himalayan yew farming of Mahankal Rural Municipality, Lalitpur.

Particulars	Amount (in NPR)
Total Variable cost	1683608.982
Average price per kg	268
Gross Return	12143080
Gross Margin	10459471.02
Total fixed cost	2902750
Total cost	4586358.982
Net Income	7556721.018
Benefit-cost ratio	2.65

Marketing channel

Himalayan yew from Mahankal Rural Municipality follows two primary distribution channels from the farmers to the final consumers.

Channel 1: Farmer – Co-operative – Processor – Distant Consumer
Channel 2: Farmer – Local collector - Processor – Distant Consumer

The distribution of Himalayan yew, found in the Mahankal Rural Municipality, operates through two distinct channels, excluding any direct sales from farmers to consumers. In Channel-I, the Lauth Sallo Multipurpose Herbal Cooperative Ltd. plays a central role by collecting Himalayan yew products—specifically, the valuable leaves and pencil-sized bark—from farmers. These collected products are then forwarded to a specialized processor, where taxol is meticulously extracted from the Himalayan yew's leaves and bark. The resulting processed liquid taxol is not only distributed to distant consumers but also exported to various countries, where it is indispensable in chemotherapy treatments. This cooperative remains the sole entity responsible for collecting Himalayan yew from local farmers and ensuring a seamless supply chain for taxol extraction. Channel II parallels Channel I in most aspects, but it differs in that farmers sell their products to a single local collector at a rate identical to the cooperative's pricing. This local collector assumes responsibility for transporting the Himalayan yew products to the processor and, subsequently, to distant consumers. It's noteworthy that only one local collector operates in this capacity. Figure 2 visually outlines the market channels, displaying the respective selling prices in each channel, providing valuable insights into the distribution process.

According to survey data, a substantial 91.43% of respondents prefer Channel 1 for selling their Himalayan yew products, while a smaller fraction of 8.57% opt for Channel II. Notably, a significant portion of the respondents are members of cooperatives, underscoring the cooperative's pivotal role in the distribution process. Additionally, it's worth mentioning that even local traders are actively engaged as cooperative members, further emphasizing the cooperative's extensive reach and influence in the region. The lack of consumer information, trader monopolies, and ineffective government policies contribute to the clandestine nature of the herbs business, obscuring trade channels and leaving stakeholders uninformed about product quality, origin, and consumption (Tiwari *et al.*, 2004). In practice, the sale of Himalayan yew products is streamlined through just two channels, highlighting a well-defined distribution system. Notably, there are no direct farm gate consumers for yew products. Instead, these products are exclusively exported outside the country in their processed form, underlining the international demand and significance of yew in its processed state. In Channel I, the distribution process for Himalayan yew unfolds systematically. Farmers first sell their products to local cooperatives, which serve as the initial link in the supply chain. These cooperatives, in turn, transfer the products to dedicated processors. The processed yew, in its final form, is subsequently exported to various countries, including but not limited to India, China, Japan, the USA, and the UAE. It's noteworthy that the ultimate product derived from it, vital for chemotherapy, is not domestically produced in Nepal, underscoring the international nature of its demand and production.

In Channel II, farmers choose to sell their products to local traders, albeit with fewer participants opting for this avenue. Remarkably, local traders offer the same competitive pricing as the cooperatives. Following the sale to the local traders, these collected yews are channeled to the same processor used in Channel I. Here, the processor skillfully processes the raw materials. The final processed product is then dispatched to various international destinations, mirroring the export route observed in Channel I, with the processed yew being sent to different countries to meet international demand. In a similar study conducted by (Bhujel & Pokhrel, 2018) it was found that district-level actors engaged in the collection of Medicinal and Aromatic Plants (MAPs) from road-heads and local market traders, storing them at district-level collection centers where three to five individuals functioned as market actors. Himalayan yew has gained prominence in the region due to favorable climate and land conditions, resulting in nearly every household cultivating these trees. This emerging crop has significantly contributed to the local economy. Farmers have the option to sell their products at a competitive rate of NPR 268 per kilogram through both local traders and cooperatives. Alternatively, they can choose to sell directly to processors at a slightly higher rate of NPR 275 per kilogram. As a result of these favorable terms and the convenience it offers, more than 90% of the population opts for Channel I, where cooperatives play a central role in the distribution process, making it the predominant channel in practice.

Constraints and opportunities

Constraints

This study conducted in the Lalitpur district has unveiled several challenges in harnessing income and employment opportunities through Himalayan yew cultivation, collection, and marketing. A significant majority, comprising 87.43% of the total respondents, highlighted the scarcity of market price

information and the unpredictability of weather as the primary constraints. These concerns were closely trailed by issues related to overharvesting and broader marketing problems. Additionally, respondents in the study identified various other constraints that impede the Himalayan yew industry's growth and prosperity.

- Farmers have limited knowledge of the cultivation of Himalayan Yew in their private lands and DFO and Agriculture Knowledge Center have no budget to train community members.
- Fluctuation of demand in the market, and lack of market information and therefore, farmers were not getting the real price of their production.
- There was a lack of communication between producers/collectors and exporters, and thus the secondary traders or middlemen were getting more benefit compared with actual producers and collectors.
- Farmers were unaware of the sustainable harvesting and marketing of Himalayan Yew. It means farmers were unskilled and untrained in scientific and sustainable methods for harvesting Himalayan Yew.
- In study areas, there is no stable market and marketing infrastructure for buying and selling Himalayan Yew.
- Producers and collectors lacked knowledge of the royalty of Himalayan Yew and permits for transportation.
- Processors and exporters were getting more benefits from Himalayan Yew than actual producers or collectors.
- Lack of Himalayan Yew research and development activities in study areas.

Opportunities

A significant majority, comprising 68.32% of the total respondents, have unequivocally recognized the suitability of the study area for high-value Lauth salla cultivation, production, and marketing. Furthermore, it is heartening to note that community members are well-informed about the economic significance of Himalayan Yew, perceiving it as a source of both income and employment. Over recent years, there has been a noticeable uptick in the demand for Himalayan Yew, signaling a promising trend. With the provision of proper knowledge and targeted training, there exists a distinct possibility of not only meeting the current market demands but also achieving profitability and higher income generation for community members. The favorable conditions extend beyond awareness and market potential— the presence of accessible transportation infrastructure, such as road linkages, augments the feasibility of Himalayan Yew development and management within the study areas. Moreover, it is important to acknowledge the migration of the younger workforce from these areas to urban centers and foreign countries in search of employment opportunities. Consequently, agricultural farmlands have been left underutilized and, in some cases, barren. Leveraging such unproductive lands to cultivate Himalayan

Yew using agro-forestry models presents an innovative and sustainable opportunity. This approach not only promises income and employment for local communities and farmers but also contributes to the conservation of wild species by reducing the pressure on them. In essence, the cultivation of Himalayan Yew holds the potential to transform underutilized lands into thriving economic assets for the benefit of the entire community.

Conclusion

In conclusion, our study sheds light on the flourishing landscape of Himalayan yew cultivation in the Mahankal Rural Municipality of Lalitpur district, offering a detailed examination of the socio-demographic factors influencing growers' practices. We found that agriculture, particularly Himalayan yew cultivation, serves as a pivotal source of income for the local populace. Notably, our investigation revealed that Himalayan yew cultivation consistently surpasses production costs, yielding substantial revenue and gross margins that significantly enhance the economic well-being of local farmers. The remarkable Benefit-Cost Ratio underscores the profitability of Himalayan yew cultivation in Mahankal, presenting a compelling case for its continued expansion. Despite the region's conducive climatic conditions, challenges persist in the marketing and production realms. The identification of only two primary marketing channels highlights untapped potential, necessitating initiatives to foster growth and enhance efficiency. Additionally, technical challenges underscore the need for innovative solutions and technical support to fortify the sustainability of Himalayan yew cultivation in the area. In essence, our research underscores both the promising prospects and existing challenges of Himalayan yew cultivation. By addressing these challenges and capitalizing on opportunities, we can empower local farmers and ensure the enduring success of this valuable industry. This study serves as a rallying call for strategic interventions and collaborative efforts to propel Himalayan yew cultivation to new heights in Mahankal and beyond, ultimately contributing to the socio-economic development of the region.

Authors contribution
Conceptualization, PT; Methodology, SD; Software, NRB; Validation, RC; Formal analysis, SK.; Investigation and Resources, PT; Data curation, RC; Writing—original draft preparation, PT; Writing—review and editing, SD; Visualization, SK; Supervision, NRB; Project administration, SK. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: We want to highlight that this article is entirely original, and we can confirm that there are no conflicts of interest to declare.

Ethical approval: Not applicable.

Data availability: The data that support the findings of this study are available on request from the corresponding author.

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