Role of NTFP-based Micro-enterprises in Livelihood Improvement of Forest User Group: A Case of a Sishnoo-based Microenterprise in the Mid-hills of Nepal

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Abstract

The research delves into the impact of non-timber forest products (NTFPs) on rural livelihoods, with a specific focus on a *Sishnoo* powder-making enterprise situated in the Pairakhet community forest in Nepal. Employing a combination of primary data collection techniques such as surveys and interviews alongside secondary data from diverse sources, the study meticulously evaluates the benefit–cost ratio of the enterprise. Moreover, it employs sophisticated statistical analyses, including the Likert Scale and Kendall Tau test, to gauge users' perceptions of the enterprise's influence on economic and social conditions. By scrutinising the economic, social and human dimensions of livelihoods, the study unveils notable positive transformations, mainly in employment generation and skill enhancement. *Sishnoo*-based microenterprises have emerged as a potent agent for bolstering economic prosperity and fostering capacity building, especially among marginalised communities. The findings underscore the critical necessity for nurturing NTFP-based microenterprises and implementing targeted business awareness initiatives to fortify rural livelihoods comprehensively.

Keywords: NTFPs, microenterprise, community forest, livelihood

INTRODUCTION

Community forestry (CF) and the utilisation of non-timber forest products (NTFPs) have garnered significant attention due to their potential to alleviate poverty and foster sustainable development in rural areas (FAO 1978). Around 1.6 billion individuals in rural areas rely on forest resources for their livelihoods, with approximately 0.30 to 0.35 billion depending on forests for both income and subsistence (Chao 2012). NTFPs have emerged as vital resources for millions worldwide, particularly those in rural and forest-dependent regions (Ahenkan and Boon 2011). NTFPs, encompassing forest products beyond timber, are increasingly recognised worldwide for their vital role in enhancing the resilience and livelihoods of rural communities in Africa and Asia, including both developed and developing countries (Mukul *et al.* 2010). Scholars such as Rasul *et al.* (2008) underscore how NTFPs contribute to poverty alleviation, especially among forest-dependent communities.

Economic impact

NTFP-based microenterprises have become key contributors to both forestry GDP and rural household income in Nepal (AEC/FNCCI 2012). NTFP-based enterprises make up over 90 per cent of rural household

income in Nepal. In hilly and mountainous areas, these enterprises play a major role. According to Pandit *et al.* (2009), in Nepal, over 700 plant species can produce NTFPs. About 150 of these species are regularly traded internationally (Shrestha *et al.* 2020). Despite their potential, the impact of CF- and NTFP-based enterprises on local livelihoods and economic opportunities has been minimal in certain regions (Gilmour 2016). More than 90 per cent of Nepal's NTFPs exported to India are in crude forms, resulting in fewer benefits to the local and national economies compared to the potential gains achievable through value-adding processing within the country (Subedi *et al.* 2000).

Social impact

Forest-dependent societies tend to be economically challenged and isolated from the constructive development initiatives (Choudhary 2008). There is a need for accurate benefit evaluations to harness the economic potential of Nepal's forest-based industries (Subedi *et al.* 2014). Improved management and marketing of NTFPs can significantly enhance employment opportunities in rural areas, leading to positive social benefits (Lamsal *et al.* 2017). Ludvig *et al.* (2016) has also stated that NTFP-based enterprises are found to be successful where individuals involved use their own ideas and innovation in running the enterprise. In Nepal, local communities and community forest user groups (CFUGs) have received training and other capacity-building opportunities solely because of the presence of microenterprises (Paudel *et al.* 2018). Apart from monetary exchanges through enterprises, social networks within a communal area have also improved. This necessitates a deeper understanding of the role of NTFP-based microenterprises in improving the livelihoods of user groups, particularly in areas like Myagdi district of Nepal.

This study aims to assess the role of NTFP-based microenterprises in enhancing the livelihoods of user groups in Nepal. Specifically, it seeks to evaluate the impact of microenterprises, such as the *sishnoo* (*Urtica dioica*) powder production enterprises, on livelihood improvement, determine the benefit–cost ratio of these enterprises, and identify the challenges and prospects they face. By achieving these objectives, the study will contribute to the literature on community forestry, NTFPs and rural development, with the ultimate goal of informing and guiding policies and practices in this domain.

Study area

The study was carried out in Pairakhet CF in Myagdi district, Nepal (Figure 1). Myagdi district is known for its diverse range of forest-based microenterprises, including *sishnoo* powder production, *allo* weaving, incense stick making, *lokta* paper production, *mudha* making and bamboo furniture making. Due to its active engagement in the *sishnoo* powder-producing microenterprise, Pairakhet CFUG was chosen in consultation with the Division Forest Office (DFO) and other stakeholders. This enterprise is notable for its successful operation and involvement of active users. It was also recommended by local authorities and organisations.

Notably, the *sishnoo* powder-producing enterprise in Pairakhet is led by women, reflecting a significant aspect of gender involvement in forest-based activities in the region. The enterprise operates as an

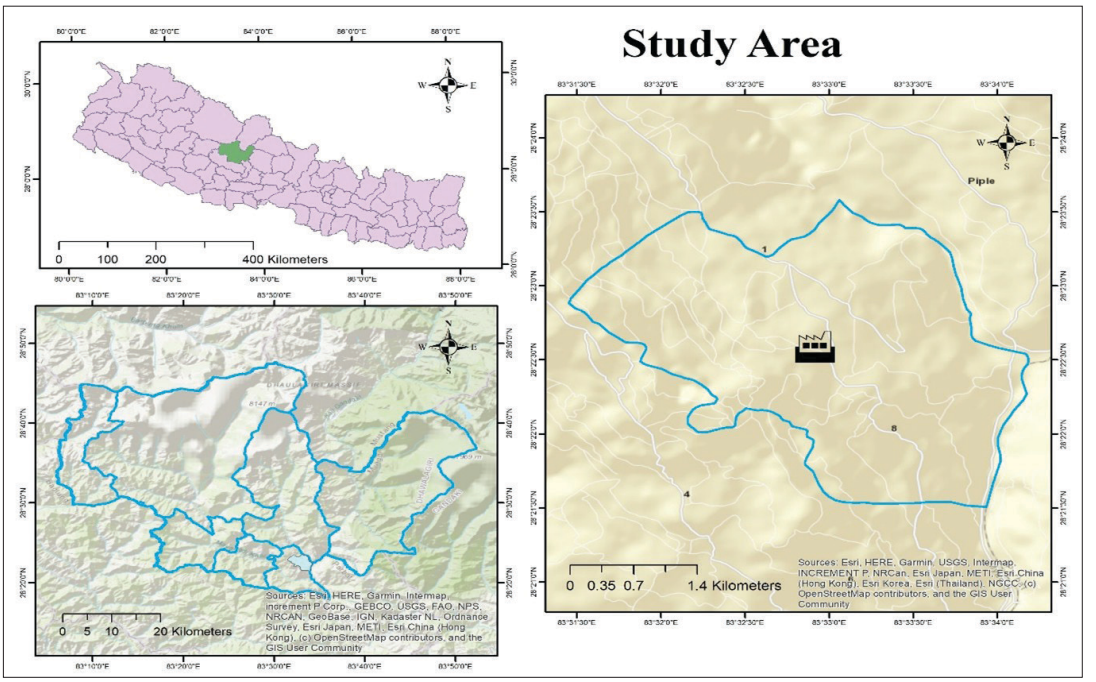

Figure 1: Pairakhet community forest, Myagdi district

extension of the Pairakhet CF and does not have a separate name. It is managed by the user group members of the community forest. Raw materials are collected from the bunds of agricultural fields, fallow lands in the community and from roadsides. Tender shoots, specifically four-leaf clovers, along with buds, are harvested. These are then dried in a solar drier or shade until the moisture content reduces to 7 to 8 per cent. Once dried, *sishnoo* leaves are grinded into a fine powder. Consumers use this *sishnoo* powder to prepare soup by mixing it with water and cooking it for five minutes. The soup has significant therapeutic properties such as anti-inflammatory, anti-rheumatic, acute diuretic and hypotensive.

METHODOLOGY

This study employed a multifaceted approach for data collection and analysis, integrating both quantitative and qualitative methods, to ensure a comprehensive understanding of the NTFP-based microenterprise. The methodology is detailed as follows:

Data collection

Primary data

Questionnaire survey: A structured questionnaire was administered to a total of 26 individuals involved in the NTFP-based microenterprise. This survey aimed to capture quantitative data on various aspects of the enterprise, including income growth, job opportunities, food provision, use of local materials and overall improvements in the standard of living. The sample size of 26 was determined based on the total number of individuals involved, ensuring that a complete census was performed within the available population.

Key informant interview (KII): Five key informants were selected for their extensive knowledge and experience with the NTFP-based enterprise and were interviewed. These informants included the chairperson of the enterprise, local leaders, organisations like Sangam Myagdi, which worked on business related to the enterprise and experts in the field, like the DFO. The interviews provided in-depth insights into the operational challenges and successes of the enterprise, offering a qualitative perspective to complement the survey data.

Focus group discussion (FGD): Three FGDs were conducted consisting of eight participants each. The discussions were designed to facilitate dialogue among various stakeholders, including employees of the enterprise and community members. The discussions aimed to explore themes and perceptions related to the enterprise's impact on the community, by gathering qualitative data through group interactions and consensus-building.

Direct observation: Field observations were carried out to collect real-time data on the daily operations and activities of the microenterprise. This method provided contextual understanding of the enterprise's functioning and its interactions with the community.

Secondary data: Secondary data were collected from published books, reports, journals and articles relevant to NTFP-based enterprises.

Data analysis

Quantitative analysis: The quantitative data obtained from the questionnaire survey were tabulated and analysed using MS-Excel and SPSS. Descriptive statistics were employed to summarise the data, and visual representations such as charts and tables were used to illustrate the key findings. The Likert scale (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree) was used to gauge respondents' attitudes, and Kendall's Tau correlation coefficient was calculated to assess the strength and significance of relationships between variables. Kendall's Tau was chosen due to its effectiveness in handling small sample sizes and its robustness in dealing with ordinal data.

Qualitative analysis: Qualitative data from KIIs and FGDs were analysed thematically. This analysis involved identifying recurring themes and patterns to derive insights into the impact and operational dynamics of the enterprise through MS-Excel.

Benefit–Cost Ratio (BCR) calculation: To evaluate the economic viability of the enterprise, a Benefit–Cost Ratio (BCR) was calculated. The BCR analysis involved projecting income and expenditures over the next five years, using historical data as a reference. The present value (PV) of benefits and costs was calculated using the formula:

$$\mathrm{PV}=\frac{Future\ Value}{(1+i)^n}$$

Where, i is the discount rate and n is the number of years. The Net Present Value (NPV) was computed as the difference between the present value of benefits and the present value of costs. The BCR was determined using the formula:

$$\mathrm{BCR}=\frac{PV_{Benifits}}{PV_{Costs}}$$

Sampling methodology

Surveys: The sampling for the questionnaire survey involved all 26 individuals associated with the NTFP-based microenterprise. This complete enumeration ensured that the survey results were representative of the entire population involved in the enterprise.

KIIs and FGDs: The selection of key informants and focus group participants was purposive. Informants were chosen based on their expertise and significant role in the enterprise. FGD participants were selected to represent various stakeholder perspectives, including employees and community members. This purposive sampling approach aimed to capture diverse viewpoints and ensure that the data reflected a range of experiences and insights relevant to the enterprise's impact and operations.

RESULTS

Role on social aspect

The significant increase in relationships, partnerships and networking among users post-establishment of the microenterprises (Figure 2) is a critical indicator of social capital formation. Of the respondents, 84.62 per cent agreed that their relationship with each other has improved as also understanding among the women involved in the enterprise.

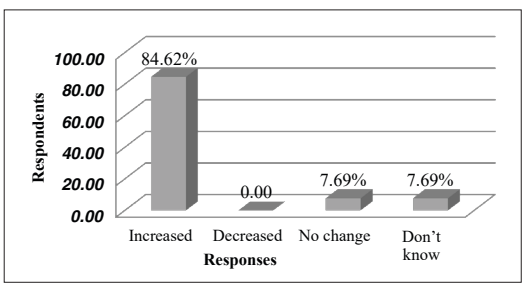

Figure 2: Relationship, partnership and networking among users

Participation of women involved in the enterprise in general assemblies and decision-making processes has increased (Figure 3). A small percentage of respondents reported "No change" or "Don't know".

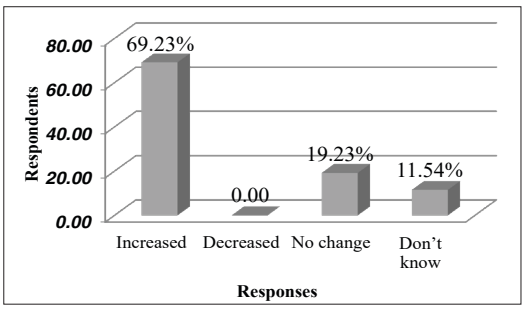

Figure 3: Participation in general assembly and decision making

Role in human aspect

The data on leadership development (Figure 4) showed that most of the community member involved in the enterprise developed leadership skills. This has enhanced their enterprise-related skills and knowledge (Figure 5) as well as common knowledge of forest product utilisation. Decision-making by women involved in the enterprise has also increased within households by 74 per cent (Figure 6).

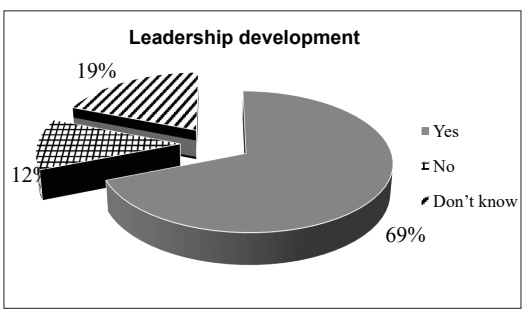

Figure 4: Leadership development

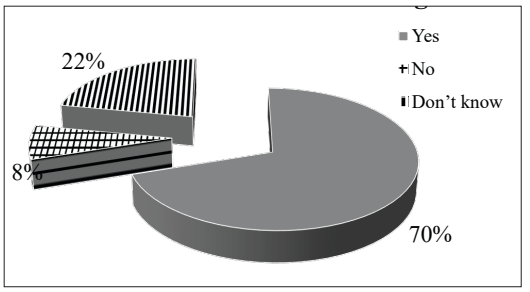

Figure 5: Rise in skills and knowledge

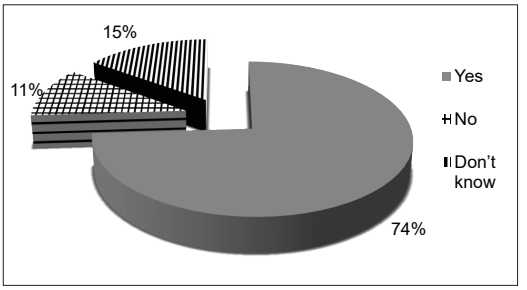

Figure 6: Role in decision making in different household activities

Role in economic aspect

Level of agreement in economic aspect

The strong positive correlations observed in the Kendall Tau analysis (Table 1) between various economic factors such as income, employment opportunities and living standards highlight the interconnected nature of economic development within the community. For example, the significant correlation between "Raise in source of income" and "Improvement of living standard of entrepreneurs" (0.933) underscores the critical role that income generation plays in enhancing overall quality of life. As income levels rise, entrepreneurs can invest more in their families' health, education and well-being, which can lead to a virtuous cycle of economic and social improvements.

Table 1: Kendell Tau correlation calculation

Variables	Kendall Tau Correlation					P-value
	Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	
Variable 1	1.00	0.667	0.690	0.748	0.933	<0.01
Variable 2	0.667	1.000	0.942	0.876	0.676	<0.01
Variable 3	0.690	0.942	1.00	0.846	0.702	<0.01
Variable 4	0.748	0.876	0.846	1.00	0.728	<0.01
Variable 5	0.933	0.676	0.702	0.728	1.00	<0.01

Variable 1: Raise in source of income Variable 2: Opportunity of employment* Variable 3: Provision of food* Variable 4: Utilisation of local material* Variable 5: Improvement of living standard of entrepreneur**

Similarly, the correlation between "Opportunity of employment" and "Provision of food" (0.942) suggests that the enterprise's ability to create jobs is directly linked to food security within the community. Employment opportunities not only provide income but also ensure that households can secure adequate food, which is fundamental for health and productivity. These findings point to the enterprise's role in addressing both economic and basic needs, which are essential for its holistic development.

The economic viability of the enterprise, as shown by the Benefit–Cost Ratio (BCR) analysis (Table 2), further reinforces the potential for long-term impact. The positive NPV and BCR indicate that the enterprise is not only sustainable but also capable of generating significant returns over time. This financial sustainability is crucial for the continued success of the enterprise and its ability to contribute to community development. The upward trend in income, despite the challenges of low market demand faced in 2021, reflects the resilience of the enterprise and its capacity to adapt to market fluctuations. This resilience is a critical factor in ensuring that the benefits of the enterprise are sustained over the long term, providing a stable source of income and improving livelihoods.

The dip in income in 2021 due to low market demand highlights the importance of developing robust marketing strategies to mitigate such risks in the future. Diversifying the market base, enhancing product quality and establishing strong distribution channels could help buffer the enterprise against such downturns. By addressing these challenges, the enterprise can ensure a more stable and continuous growth trajectory, which would further strengthen its role in community development.

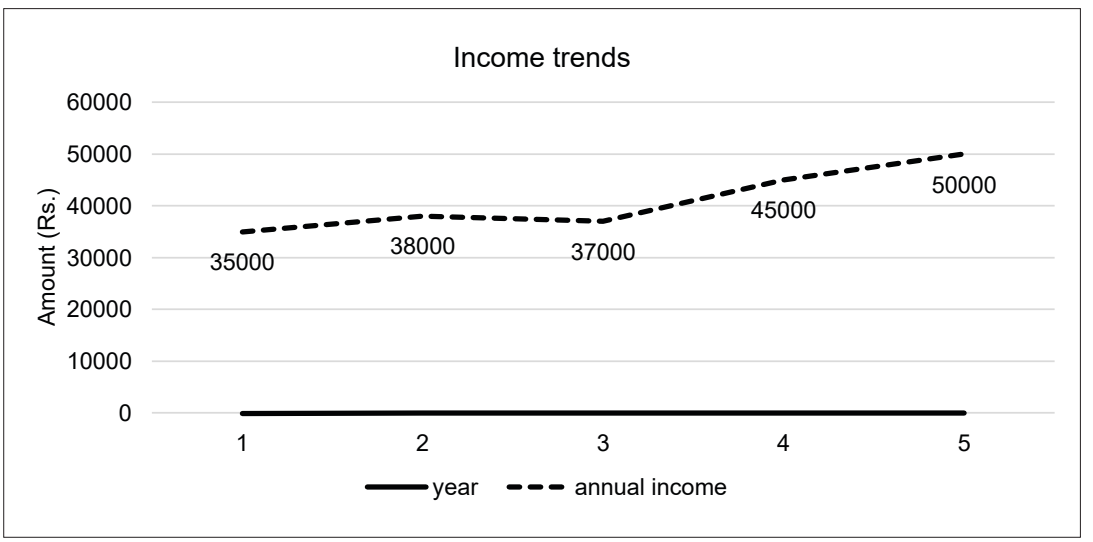

Figure 7: Annual income trends of the enterprise

NPV for the first year will be Rs 9,090.91, while for the fifth year it will be Rs 52,558.51, leading to 1.23 BCR (Table 2), indicating that it is safe to run the enterprise.

Table 2: Benefit–Cost Ratio calculation

Years	Benefit (Rs)	PV-B (Rs)	Cost (Rs)	PV-C (Rs)	NPV (Rs)	B/C ratio
First	10000	45454.55	40000	36363.64	9090.91	1.23
Second	15000	57851.23	55000	45454.55	12396.69	
Third	24000	60105.18	56000	42073.63	18031.56	
Forth	10000	54641.08	70000	47810.94	6830.13	
Fifth	10000	62092.13	90000	55882.92	6209.21	
Total	45153.04	280144.18	311000	227585.67	52558.51	

Interest rate 10 %

SWOT analysis of microenterprise

Users accepted the microenterprise as a good and supportive means to sustain their livelihood because they could get significantly more benefits than from agricultural crops on same investment, time and labour. Despite these, entrepreneurs are facing problems in running the enterprise.

Table 3: Strengths, weaknesses, opportunities and threats of the enterprise

Strengths

- Sustainable resource management
- Economic resilience through employment
- Diversified market opportunities
- Environmental stewardship and a positive image
- Community involvement for local support
- Empowering women in CFUG

Example: By implementing sustainable harvesting practices for an underused plant, *Sishnoo*, the enterprise has earned the trust and support of both local communities and environmentally conscious consumers. As a result, 26 CFUG women members were empowered through employment opportunities, with their incomes showing a positive annual trend (Figure 7). Initially, the market was limited to a few neighbouring areas, but, by the fifth year, the enterprise had expanded its reach to the neighbouring districts of Baglung and Parbat. This positive image has not only strengthened customer loyalty but also garnered robust local support, further enhancing the enterprise's sustainability initiatives and market position.

Weaknesses

- Ineffective marketing strategies
- Low product prices
- Dependence on the local workforce
- Vulnerability to raw material destruction
- High transportation costs

Example: Despite the superior quality of its products, the enterprise struggles with ineffective marketing strategies and has been unable to expand its reach across the country. The current approach relies heavily on word-of-mouth within the local community and district, with limited efforts in online presence or branding. While the enterprise can sustain the livelihoods of its workers, it is still unable to afford the high transportation costs needed for broader distribution.

Opportunities	Threats
• Expansion into new markets • Collaborative value-adding processes • Leveraging environmental stewardship • Partnerships for sustainable livelihoods • Innovative product development • Self-growth and empowerment in CFUG *Example:* With further advancement like eco-friendly packaging, the CFUG can add value to the product and expand the market to other regions as well. Innovative product development, such as s*ishnoo*-infused tea and skincare products, will diversify the product range and attract a broader customer base. Finally, the enterprise's focus on self-growth and empowerment, particularly for women members of the CFUG, through training and capacity-building, strengthens the overall community and ensures long-term sustainable development.	• Competitors with better marketing • Pressure on profit margins • Continued migration of CFUG members to urban areas • Persistent raw material destruction • Escalating transportation costs *Example:* Competitors with superior marketing strategies leverage online platforms and partnerships to reach wider markets, making it difficult for the microenterprise to expand beyond its local region. This, combined with escalating transportation costs due to its remote location, pressures profit margins and limits market expansion. Additionally, continued migration of young people to urban areas reduces the local workforce, while persistent threats to the forest ecosystem jeopardise the availability of raw materials. These challenges collectively threaten the long-term viability of the enterprise and the livelihoods of the women involved.

DISCUSSION

The analysis of the NTFP-based microenterprise highlights its significant potential for improving the livelihoods of rural communities. With a favourable BCR of 1.23, indicating profitability and positive impacts on human and social aspects, microenterprises emerge as viable options for sustainable economic development. However, despite these promising indicators, several challenges persist, particularly with regard to market access. The limited marketing reach, primarily confined to district and neighbouring areas, poses a substantial barrier to the scalability and sustainability of NTFP-based enterprises. This finding is consistent with findings from previous studies, such as Paudel *et al.* (2018), which identified the lack of adequate market access as a major constraint in Nepal's NTFP sector. The absence of technical expertise, financial resources and reliable market channels for processed NTFPs exacerbates this challenge (Shrestha *et al.* 2020). Moreover, the growing trends of foreign employment and urban migration have led to reduced engagement in local enterprises (Pandit *et al.* 2009). Not only this, the NTFP sub-sector is well-positioned to counteract this trend by offering job opportunities and income-generation avenues for rural populations. In doing so, it holds potential for mitigating poverty and curbing youth migration for employment opportunities elsewhere (Karki and Bhattarai 2012). The results also indicate that different variables, like income-generating prospects and employment opportunities within NTFP-based microenterprises, are

strongly correlated and development of one can lead to overall community livelihood development. This underscores the relevance of community forestry as not only an ecological conservation model by also a socioeconomic development tool (Gauli and Hauser 2009). Therefore, fostering the potential of NTFP-based enterprises to provide sustainable livelihood options within rural communities meaningfully contributes to the rural poverty and sustainable forest governance in Nepal. This notion is further supported by increasing community willingness to participate in such enterprises, particularly for NTFPs (Paudel *et al.* 2022). Additionally, this research states the positive impact of microenterprises on enhancing leadership skills and decision-making abilities among members, a finding also reported by previous research (Pandit *et al.* 2009). This capacity-building aspect is crucial for navigating global challenges, particularly the inequality crisis (Paudel *et al.* 2022). Inclination of the community towards conservation activities has also increased, as a result of which they are becoming aware of biodiversity conservation (Villanger 2015). Furthermore, the active involvement of women in CFUGs and their collaboration with other stakeholders signal a promising trend, echoing findings from Rasul *et al.* (2008). Such collaborations foster inclusive decision-making processes and strengthens community resilience.

CONCLUSION

The study underscores the substantial potential of NTFP-based microenterprises in bolstering rural livelihoods across Nepal, as exemplified by the *Sishnoo* powder-producing microenterprise. Encouraging outcomes were observed in terms of enhanced social cohesion, improved leadership skills and strengthened financial assets, further supported by a favourable BCR. However, persistent challenges related to market accessibility, product pricing and resource management continue to impede progress. Proposed solutions entail providing training on sustainable methods, establishing effective marketing channels and empowering women within the enterprise. Crucially, governmental and non-governmental interventions are essential to optimise market operations and foster broader social engagement. Looking ahead, concerted action is imperative to address existing constraints and fully harness the potential of NTFP-based enterprises for poverty reduction and sustainable development. Recognising the study's limitations, including its narrow geographical scope and reliance on self-reported data, the study underscores the necessity for future research to adopt broader and mixed-method approaches for a more comprehensive understanding of NTFP-based microenterprises in Nepal.

REFERENCES

AEC/FNCCI. 2012. *Balanced Economic Growth, One District One Product (ODOP): Local Employment, Income Generation and Food Security*. A Report. Federation of Nepalese Chambers of Commerce and Industry.

Ahenkan, A. and Boon, E. 2011. Non-Timber Forest Products (NTFPs): Clearing the Confusion in Semantics. *Journal of Human Ecology*. https://doi.org/10.1080/09709274.2011.1190634

Chao, S. 2012. Forest peoples: numbers across the world. Moreton-in-Marsh, UK: *Forest Peoples Programme* **10**. https://doi.org/10.13140/RG.2.2.21192.14088

Choudhary, D. 2008. Potential Micro-Enterprises and Income Generating Activities in the Kangchenjunga Landscape. In: N. Chettri, B. Shakya and E. Sharma (Eds.), *Biodiversity Conservation in the Kangchenjunga Landscape*. ICIMOD.

FAO. 1978. *Non-Wood Forest Products for Rural Income and Sustainable Development.* FAO Forestry. FAO Forestry Paper, No.7.

Gauli, K., and Hauser, M. 2009. Pro-poor Commercial Management of Non-timber Forest Products in Nepal's Community Forest User Groups: Factors for Success. Mountain Research and Development. **29**(4): 298-307. 10.1659/mrd.00051.

Gilmour, D. A. 2016. *Forty Years of Community-Based Forestry: A Review of its Extent and Effectiveness.* Food and Agriculture Organization of the United Nations.

Karki, M. B. and Bhattarai, N. 2012. *Enhancing the Contribution of Non-timber Forest Products in Supporting Green Economy and Sustainable Development in Mountain Countries.* ICIMOD.

Lamsal, P., Pant, K. P. and Bhatta, D. R. 2017. Forest-Based Micro and Small Enterprises in Nepal: Review of Status, Constraints, Scope, and Approach Effectiveness. *International Forestry Review*, **19**(1): 42-54 http://dx.doi.org/10.1505/146554817820888582

Ludvig, A., Tahvanainen, V., Dickson, A., Evard, C., Kurttila, M., Cosovic, M., Chapman, E., Wilding, M. and Weiss, G. 2016. The practice of entrepreneurship in the non-wood forest products sector: Support for innovation on private forest land. *Forest Policy and Economics*, **66**:31-37 https://doi.org/10.1016/j.forpol.2016.02.007

Mukul, S., Uddin, M., Rashid, A. Z. M. M. and Fox, J. 2010. Integrating Livelihoods and Conservation in Protected Areas: Understanding the Role and Stakeholder Views on Prospects for Non-Timber Forest Products, a Bangladesh Case Study. *International Journal of Sustainable Development & World Ecology*, **17**(2): 180-188 https://doi.org/10.1080/13504500903549676

Pandit, B. H., Albano, A. and Kumar, C. 2009. Community-Based Forest Enterprises in Nepal: An Analysis of Their Role in Increasing Income Benefits to the Poor. *Small-Scale Forestry*, **8**(4): 447–462. https://doi.org/10.1007/s11842-009-9094-2

Paudel, G., Poudyal, K., Paudel, D. and Pandit, B. H. 2022. Can Community Forestry Groups Run Forest Businesses in Nepal? *Revitalising Community Forestry in the Changing Socioeconomic Context of Nepal.*

Paudel, N. S., Adhikary, A., M bairamadji, J., and Nguyen, T. Q. 2018. *Small-Scale Forest Enterprise Development in Nepal: Overview, Issues and Challenges.* FAO.

Rasul, G., Karki, M. and Sah, R. P. 2008. The Role of Non-Timber Forest Products in Poverty Reduction in India: Prospects and Problems. *Development in Practice*, **18**(6): 779–788. http://dx.doi.org/10.1080/09614520802386876

Shrestha, S., Shrestha, J. and Shah, K. K. 2020. Non-Timber Forest Products and their Role in the Livelihoods of People of Nepal: A Critical Review. *Grassroots Journal of Natural Resources*, **3**(2): 42–56. http://dx.doi.org/10.33002/nr2581.6853.03024

Subedi, B., Koontz, A., Binayee, S., Divis, J., Ojha, H., and Croucher, J. 2000. Enterprise development for natural products: Manual. Asia Network for Sustainable Bioresources (ANSAB).

Subedi, B. P., Ghimire, P. L., Koontz, A., Khanal, S. C., Katwal, P., Sthapit, K. R. and Mishra, S. K. 2014. *Private Sector Involvement and Investment in Nepal's Forestry Sector: Status, Prospects and Ways Forward.* Multi-Stakeholder Forestry Programme.

Villanger, E. 2015. Entrepreneurial Abilities and Barriers to Microenterprise Growth: A Case Study in Nepal. *The Journal of Entrepreneurship*, **24**(2): 115–147. https://doi.org/10.1177/0974927615586888