

Evaluating the stakeholder's potential for NTFP entrepreneurship development using the SWOT-AHP framework in Gurez Himalaya

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Abstract

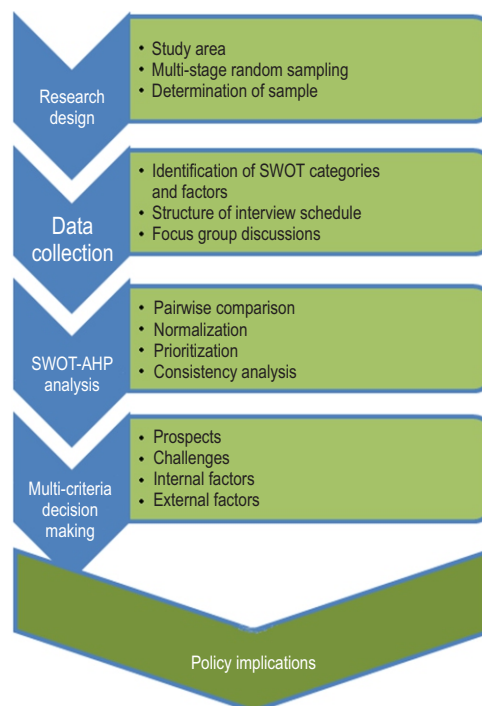
Aim: This study employed the SWOT (strengths, weaknesses, opportunities, and threats)-AHP (analytic hierarchy process) framework to evaluate the stakeholders' potential for Non-timber forest products (NTFP) entrepreneurship development through multi-criteria decision-making insights in Gurez Himalaya.

Methodology: Multi-stage random sampling technique was adopted to select 3 sub-divisions, 18 villages, and 337 NTFP stakeholders for the survey. Data were collected through 36 focus group discussions, two conducted in each village, to evaluate the NTFP stakeholders' perceptions of SWOT categories (4) and factors (16) for NTFP entrepreneurship development. Descriptive statistics, pair-wise preference ranking and SWOT-AHP framework were used for data analysis.

Results: Results indicated that strengths had the highest global priority weight (0.500), followed by opportunities (0.319), weaknesses (0.119), and threats (0.062) among the NTFP stakeholders for NTFP entrepreneurship development. The prospects (strengths + opportunities) (0.819) outweighed the challenges (weaknesses + threats) (0.181), and the internal factors (strengths + weaknesses) (0.619) prevailed over the external factors (opportunities + threats) (0.381) for NTFP entrepreneurship development. Stakeholders possessed significant potential for NTFP entrepreneurship development; however, various limitations impeded its implementation.

Interpretation: These findings serve as the foundation for policy implications to prioritize and address significant challenges and exploit the prospects for conceptualizing, devising, and executing strategies for enhancing NTFP-based entrepreneurial development. NTFP stakeholders' perceptions of SWOT will be the fundamental elements that could be stimulated in the multi-criteria decision-making process for scaling up NTFP entrepreneurship in Gurez Himalaya.

Key words: AHP framework, Entrepreneurship, Gurez Himalaya, NTFP entrepreneurship, SWOT analysis



Introduction

Non-timber forest products (NTFPs) play a crucial role in the livelihood security of about 1.6 billion people around the world by sustaining food security, livestock production, bio-energy security, agricultural support, rural housing, cottage industries, health care, socio-culture, income diversification, and employment generation (Islam and Quli, 2017; Rahman *et al.*, 2021). NTFPs meet the household subsistence needs of people dwelling in or around the forests across the world (Asamoah *et al.*, 2023), generate a significant cash income by trading the NTFPs (Mahonya *et al.*, 2019), and supply a safety net to fill the gaps if any shortfall or emergency arises (Dinda *et al.*, 2020), besides creating alternate sources of employment for rural people (Mugido and Shackleton, 2019). Basically, the NTFPs are renewable forest materials characterized by their significant market value (Dinda *et al.*, 2020), cultural and experiential services (Peerzada *et al.*, 2022), provisions for gender equality (Le and Nguyen, 2020), promotion of rural industrialization (Bannor *et al.*, 2021), alleviation of rural poverty (Wiebe *et al.*, 2022), inheritance of indigenous traditional knowledge (Islam *et al.*, 2024), development of small-scale enterprises (Meinhold and Darr, 2019), strengthening skill-based innovations and entrepreneurship (Mada *et al.*, 2023), and contribution to local livelihoods (Taghouti *et al.*, 2021).

Human well-being has conventionally been governed by NTFP diversity and accessibility, ecosystem services, biophysical setting, and socio-economic conditions, especially for communities dwelling in rural and remote places (Shaikh *et al.*, 2021). NTFPs have been traditionally managed and sustainably used by forest dwellers or fringe communities around the world for their sustenance, livelihood, and survival (Ali *et al.*, 2020). The cultural knowledge of NTFP management has evolved through trial-and-error methods over the ages to adjust to the needs of the people, which is amassed in the form of traditional ecological knowledge and passed on to successive generations (Atta *et al.*, 2023). The NTFPs fulfil rural residents' social, religious, cultural, traditional, ecological, moral, spiritual, and political aspirations (Mugido and Shackleton, 2019). It renders rural population a variety of job options, including direct employment, secondary employment, and self-employment (Garekae *et al.*, 2019). The judicious use of NTFPs by ethnic communities is the key to achieve sustainable forest management, contributing to biodiversity conservation (Mendako *et al.*, 2022).

The Shina tribe of the Gurez Himalayas, like other ethnic communities, is underprivileged with respect to socio-economic status, prosperity, livelihoods, employment and income, education, health and infrastructure, leading to poverty, a substandard lifestyle, alienation, and migration despite inhabiting resource-rich landscapes and having NTFP traditional skill bases (Islam *et al.*, 2025a). Although crop cultivation and livestock production are the main sources of livelihood and economy, NTFPs remain an integral component of the livelihood and economic security of ethnic communities (Talukdar *et al.*, 2021).

The role of NTFPs in the livelihood security, household economies, and socio-economic development of ethnic people has received increasing attention from the scientific communities and policymakers in developing countries (Shaikh *et al.*, 2021). Multitudes of studies have been focused on the quantification, economic valuation, livelihood contribution, and poverty alleviation that NTFP make to the millions of ethnic households who live near forests (Wiebe *et al.*, 2022; Islam *et al.*, 2025b). Hence, non-governmental organisations (NGOs), governmental organisations (GOs), and national donor agencies are interested in NTFP entrepreneurship development for solutions to reduce poverty and ensure livelihood sustainability (Talukdar *et al.*, 2021; Peerzada *et al.*, 2022).

Entrepreneurship development through value addition (time, place, form, and possession) and commercialization of NTFP is novel for rural livelihood diversification and economic development (Bannor *et al.*, 2021). The value addition of NTFPs and enterprise development deserves special consideration since they have major potential to contribute to income generation and employment opportunities (Mada *et al.*, 2023). NTFP entrepreneurship and commercialization are still in their infancy due to the extensive use of NTFP for subsistence in rural households (Asamoah *et al.*, 2023). However, the value addition of NTFPs and the subsequent entrepreneurial development are a major option for rural economies and a potential source of improved livelihoods for ethnic communities (Yego *et al.*, 2021).

Basically, the success of NTFP's entrepreneurship and commercialization for livelihood sustainability depends on a number of factors relating to the strengths, weaknesses, opportunities, and threats (SWOT) of the intervention (Islam *et al.*, 2020). Understanding the SWOT concerns of NTFP entrepreneurship can give careful insight to scientists and policymakers for strategy formulation and execution (Etongo *et al.*, 2018). The identification and analysis of SWOT factors using the analytic hierarchy process (AHP) is a useful technique for evaluating stakeholders' perceptions in NTFP entrepreneurship (Kukrety *et al.*, 2013). For the development of NTFP entrepreneurship, the systematic thinking and thorough diagnosis of SWOT will scrutinize internal factors (strengths and weaknesses) and elucidate external factors (opportunities and threats) (Kukrety *et al.*, 2013; Etongo *et al.*, 2018).

NTFPs constitute an important source of subsistence, cash income, employment, and safety nets for the forest fringe Shina community in the Gurez valley of Kashmir (Islam *et al.*, 2025a). They are the third major component of household economy and employment after agriculture and livestock, and secure about 23.95% of the total household income (Atta *et al.*, 2023). While the NTFPs sector has potential for economic growth, little attention has been given to NTFPs-based entrepreneurship and innovation development. Hence, it is essential for the success of local NTFP-based enterprises to find suitable market niches, build new innovations, and have good business management competencies. The role of NTFP-based

enterprises and entrepreneurship in economic development is likely to increase in the future because of the limited possibilities to expand public sector activities in the region. Although NTFP entrepreneurship has received recognition as an important choice in the industrial and financial planning of the state, some immediate and sensible policy perspectives are still crucial to strengthen this entrepreneurship. Promotion of NTFP entrepreneurship is essential for socio-economic development, livelihood diversification, and ecological resilience. Hence, empirical research on the NTFP stakeholders' perceptions towards NTFP entrepreneurship development using the SWOT-AHP approach is an essential aspect to be diagnosed.

To address this issue, a deeper understanding of the complexities involved with the NTFP transactions from key NTFP stakeholders' groups, including collectors, processors, petty traders, retailers, wholesalers, craftsmen, commission agents, forwarding agents, village collectors, etc., is needed. The SWOT-AHP framework is a multi-criteria mathematical model to evaluate stakeholders' perceptions towards the development of NTFP entrepreneurship. SWOT-AHP analysis quantifies the relative significance of factors within a single SWOT category or between different SWOT categories based on stakeholders' perspectives. This study aims to analyze the strengths, weaknesses, opportunities, and threats for NTFP entrepreneurship development employing the SWOT-AHP approach in the Gurez valley of Kashmir. The underlying objective of SWOT-AHP analysis is to provide rationale for stakeholders to determine the internal and external factors, prospects, and challenges for NTFP entrepreneurship development.

Materials and Methods

Study area: Gurez Valley (Fig. 1) is located in the Bandipora district of J&K UT at 34°23' and 34°41' N latitudes and 74°37' to 74°46' E longitudes, 2370 m amsl. The valley occupies an area of over 57842 ha and consists of mountainous ranges, flat grasslands and rich dense coniferous and broad-leaved forests in the Himalayas. The area is inhabited by 31912 people, including the Shina tribe of Dardic ethnic group (81.84%), who have a unique socio-cultural, traditional, and linguistic identity (Census of India, 2011). The Shina people mostly depend on agriculture, raising cattle, and gathering non-timber forest products (NTFPs) for their livelihood. The valley has a temperate climate with four distinct seasons and intense snowfall during winter season.

Sampling design: A reconnaissance survey of the entire study area was conducted for identification of the sampling units prior to the layout of the experiments. A multistage random sampling technique (Ray and Mondol, 2011) was adopted to select subdivisions, villages and NTFP stakeholders for the survey. The 1st stage was the purposive selection of all three subdivisions: Tulail, Dawar and Gulshanpora. Eighteen villages were selected for the 2nd stage through proportionate random sampling at 50% intensity. These included twelve from Tulail, four from Dawar, and two from Gulshanpora subdivisions. In the 3rd stage, all the 337

NTFP stakeholders were sampled from the selected villages to carry out the village-level focus group discussions (FGDs) (Table 1). Both purposive and proportionate random sampling were combined to produce a valid sampling procedure by minimizing selection bias and maximizing sample size in the homogeneous population (Islam et al., 2024) and ensuring credibility for the research findings.

Data collection: The data were gathered from the NTFP stakeholders through a structured AHP interview schedule administered in 36 focus group discussions (FGDs), two at each village, consisting of 7–12 participants (Mangal and Mangal, 2020). The interview schedule constructed for data collection from the NTFP stakeholders included four SWOT categories and sixteen factors for NTFP entrepreneurship development (Table 2). The specific and relevant SWOT factors regarding NTFP entrepreneurship development were identified through literature reviews, discussion with state forest officials and KVK staffs, as well as the investigator's personal experiences, and were systematically incorporated in the interview schedule. NTFP stakeholder groups were asked to make a consensus and tick (✓) one of five response categories—equally importance, moderate importance, strong importance, very strong importance, or extreme importance—provided against the identified SWOT aspects regarding the building of NTFP entrepreneurship, with their corresponding scores of 1, 3, 5, 7 or 9, respectively (Fig. 2). The intermediate values between adjacent scale values for the five response categories were 2, 4, 6 and 8 (Table 3).

SWOT-AHP framework: The SWOT-AHP analysis (Etongo et al., 2018) was conducted in three steps. In the first step, the pertinent factors for each SWOT category (Strengths, Weaknesses, Opportunities and Threats) were identified on the basis of consultation with experts and brainstorming sessions with heterogeneous NTFPs takeholders (Table 2). In the second step, pair-wise comparison of factors within each SWOT category was conducted using FGDs (Fig. 2). In the FGDs, each factor in a particular SWOT category was compared with all the other factors in the same category to ascertain their relative priorities. FGDs participants were asked to evaluate one factor over another and score them in order of priority based on a rating scale ranging from 1 to 9 (Table 3). In the 3rd step, the pair-wise comparisons of SWOT factors were represented as matrix of relative priorities where the assigned relative priorities were entered into the matrix as an element a_{ij} and its reciprocal $1/a_{ji}$ were placed to the opposite side of the main diagonal.

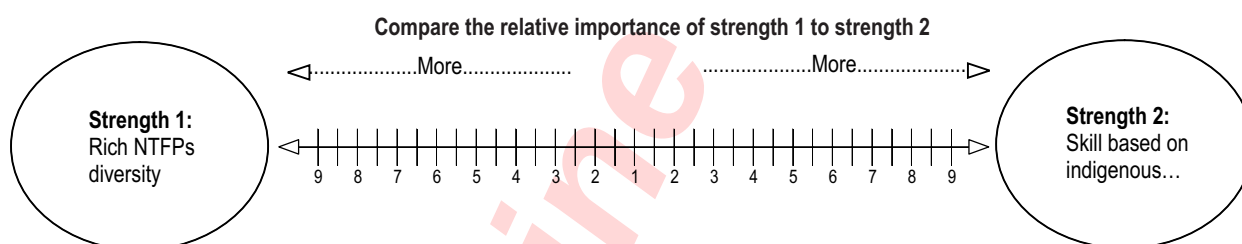
$$A = (a_{ij}) = \begin{matrix} & \begin{matrix} W_1/W_1 & W_1/W_2 & W_1/W_3 & W_1/W_4 \end{matrix} \\ \begin{matrix} W_2/W_1 \\ W_3/W_1 \\ W_4/W_1 \end{matrix} & \begin{matrix} W_2/W_2 & W_2/W_3 & W_2/W_4 \\ W_3/W_2 & W_3/W_3 & W_3/W_4 \\ W_4/W_2 & W_4/W_3 & W_4/W_4 \end{matrix} \end{matrix}$$

In the matrix, rows indicate ratio of priorities of each factor with respect to all others and the element $a_{ij} = 1$ and $i = j$. Thereafter, the transpose of the vector of weights w was multiplied by matrix A to obtain a vector represented by $\lambda_{\max} w$,

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Table 1: Sampling of NTFP stakeholders for village-level focus group discussion (FGD)

Sub-division	Village	Participant NTFP stakeholders	
		FGD-1	FGD-2
Gulshanpora	Gulshanpora	11	11
Gulshanpora	Nail-Kanzalwan	10	10
Dawar	Mastaan-khopri	8	8
Dawar	Dawar	11	10
Dawar	Markoot	11	11
Dawar	Shahpora	10	10
Tilail	Kalshipain	12	12
Tilail	Dangithal	9	8
Tilail	Purana-tilail	11	10
Tilail	Manzgund	9	8
Tilail	Wazirithal	8	8
Tilail	Niru	8	8
Tilail	Saradab	9	9
Tilail	Gundgul-sheikh	10	9
Tilail	Husangam	8	7
Tilail	Gujran	8	7
Tilail	Abdullan	8	8
Tilail	Forestblock	11	11
03	18	172	165

**Fig. 2:** Example of a pair-wise comparison of strength factors.

where, $Aw = \lambda_{\max} w$ or $(Aw - \lambda_{\max} I)w = 0$;

$w = (w_1, w_2, w_3 \text{ or } w_4)^T$;

$\lambda_{\max}$ is the largest Eigen value of matrix A; w is the transpose of the vector of weights; I is the identity matrix of size n.

The largest Eigen value, $\lambda_{\max} > n$ is a necessary condition for consistency (Saaty, 1996). The matrix was tested for consistency by the following formula:

$$CI = (\lambda_{\max} - n) / (n - 1)$$

$$CR = CI / RI$$

Where, CI is the consistency index, CR is the consistency ratio, and RI is the random index of a random matrix of order n. As a general rule, the consistency ratio of 10% or less is considered acceptable. The relative priorities of SWOT groups are used to compute the factors' global priorities, which was achieved by multiplying the local factor priorities by the corresponding group

priority values. Since the sum of overall priority scores for the factors (or categories) is one, they represent the proportionate contribution each factor (or category) made to the overall perception of NTFP stakeholders.

Results and Discussion

The priority weights of the SWOT categories indicated that the NTFP stakeholders had the highest perception of strengths (0.500), followed by opportunities (0.319), weaknesses (0.119) and threats (0.062), respectively (Table 4). The priority scores of strength and opportunity factors were interpreted as positives of NTFP entrepreneurship development, while the scores of weakness and threat factors were interpreted as negatives. Strength and opportunity factors were assigned higher weights than weakness and threat factors. The possible explanation for these findings could be the traditional exploitation of multiple NTFPs by the local people for livelihood security in

Table 2: SWOT Categories and factors identified for NTFP entrepreneurship development

	Positive	Negative
	<i>Strengths</i>	<i>Weaknesses</i>
Internal	S1: Rich NTFPs diversity S2: Skill based on indigenous traditional knowledge (ITK) S3: Feedstock for NTFPs based industries and enterprises S4: Income and employment diversification	W1: Lack of institutional support and extension services W2: Poor processing, transport and storage infrastructure W3: Seasonal subsistence and supplementary income W4: High labour intensive and less remunerative livelihood
	<i>Opportunities</i>	<i>Threats</i>
External	O1: Domestication and production of NTFPs O2: Value addition and commercialization of NTFPs O3: Poverty alleviation and socioeconomic development O4: Supportive Government policy and regulations	T1: Depletion of forest resources T2: Climate change and climate variability T3: Competition from other growing economies T4: Limited marketing infrastructure and unpredictability of markets

Table 3: AHP 9-point fundamental scale (Saaty, 1996)

Intensity of Importance	Verbal judgment of preference	Explanation
1	Equally importance	Two elements are equally important
3	Moderate importance	One element is slightly more important than another
5	Strong importance	One element is strongly more important compared to another
7	Very strong importance	One element is very strongly more important over another
9	Extreme importance	Absolute dominance of one element over another
2, 4, 6, and 8	Intermediate values between adjacent scale values	When compromise is needed
Reciprocals (1/x)	Reciprocals for inverse comparison	A value attributed when activity i compared to activity j becomes the reciprocal when j is compared to i

Table 4: Comparison matrix and weights of SWOT categories

SWOT Category	Strengths	Weaknesses	Opportunities	Threats	Weights	Ranking
Strengths	1	5	2	6	0.500	1 st
Weaknesses	1/5	1	1/4	3	0.119	3 rd
Opportunities	1/2	4	1	5	0.319	2 nd
Threats	1/6	1/3	0.2	1	0.062	4 th

$$\lambda_{\max} = 4.26, CI=0.08, CR=0.09$$

terms of subsistence, cash income, safety nets, and employment (Islam *et al.*, 2025b). Hence, sustaining livelihoods through innovative NTFP entrepreneurship could be an important strategy for poverty reduction, inequality mitigation, and socio-economic development for backward ethnic people (Atta *et al.*, 2023). The most recognized strength for NTFP entrepreneurship development is income and employment diversification, which secured the highest priority (local weight= 0.510; rank= 1st) as perceived by the NTFP stakeholders. Rich NTFP diversity (local weight= 0.259; rank= 2nd), feedstock for NTFP-based industries and enterprises (local weight= 0.167; rank= 3rd), and skills based on indigenous traditional knowledge (ITK) (local weight= 0.064; rank= 4th) were identified as important strengths but were given lower priorities (Table 5; Fig. 3). The NTFP stakeholders viewed income and employment diversification as the most prominent

strength, which can be attributed to the fact that this factor has a direct impact on NTFP stakeholders' subsistence, income, safety nets, well-being, standard of living and survival. Rich NTFP diversity, feedstock for NTFP-based industries and enterprises, and skills based on indigenous traditional knowledge received lower priorities among the strength factors, which reflects the NTFP stakeholders' low awareness and acquaintance with the values of these factors. Worldwide studies have underscored that strengths are the most important predictors for NTFP entrepreneurship development to support local livelihoods, a view that corroborates with the present findings (Garekae *et al.*, 2019; Meinhold and Darr, 2019; Le and Nguyen, 2020).

The most significant weakness for NTFP entrepreneurship development, as perceived by the NTFP

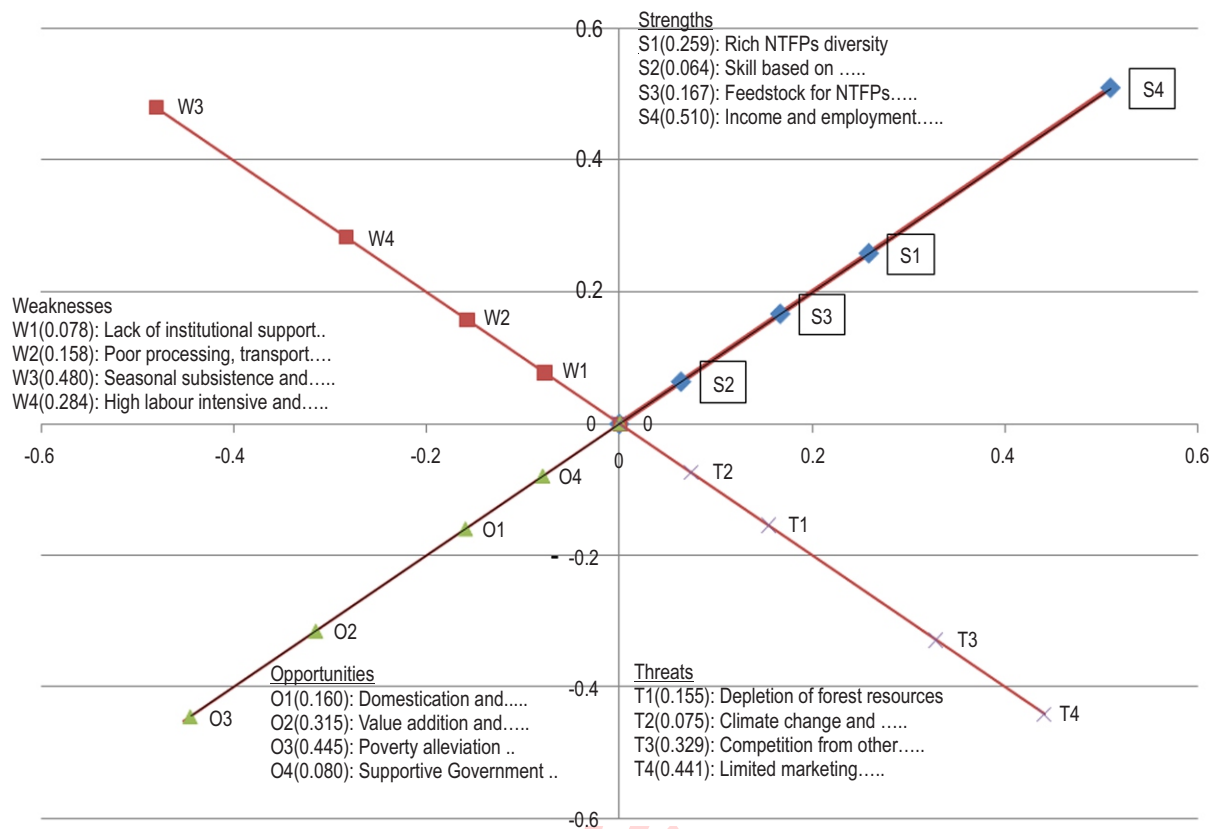


Fig. 3: Perceptions of the NTFP stakeholders towards NTFP entrepreneurship development.

stakeholders, was seasonal subsistence and supplementary income (local weight= 0.480; rank= 1st), followed by high labour-intensive and less remunerative livelihoods (local weight= 0.284; rank= 2nd) (Table 5). The NTFP collection, value addition, and trade have a limited period confined to only six months, and the peak period for all major NTFPs was only two months. Hence, the nature of NTFP occupations is seasonal, time-bound, and subsidiary, and cannot be adopted as a main source of income. Further, NTFP collection, processing, and marketing are cumbersome, labour-intensive, and time-consuming jobs, and the prices the NTFP stakeholders receive for the NTFPs are not remunerative for their efforts. Hence, weaknesses such as seasonal subsistence and supplementary income, and high labour-intensive and less remunerative livelihoods, were serious constraints in the adoption of NTFP entrepreneurship.

Poor processing, transport, and storage infrastructure (local weight= 0.158; rank= 3rd) and the lack of institutional support and extension services (local weight= 0.078; rank= 4th) were also considered prominent weaknesses by the NTFP stakeholders, but were the low-ranked weaknesses (Table 5). This trend clearly indicates that addressing these weaknesses properly will help create a favourable environment for NTFP entrepreneurship development. The observations made by

Garekai et al. (2019) in the Chobe Enclave, Botswana, Taghouti et al. (2021) in Tunisia, and Mendako et al. (2022) in the Rubi-Tele Hunting Domain, DR Congo, are consistent with the current findings, which show the crucial role that weaknesses play in restricting the development of NTFP entrepreneurship.

Poverty alleviation and socio-economic development (local weight= 0.445; rank= 1st) was the top potential opportunity as adjudged by the NTFP stakeholders. Value addition and commercialization of NTFPs (local weight= 0.315; rank= 2nd) and domestication and production of NTFPs (local weight= 0.160; rank= 3rd) were perceived as the next stronger opportunities for NTFP entrepreneurship development. Supportive government policy and regulations (local weight= 0.080; rank= 4th) was the lowest-ranked opportunity for NTFP entrepreneurship development (Table 5). Among the opportunity factors, the NTFP stakeholders have a strong perception of the potential role of NTFP entrepreneurship in sustainable livelihoods and socio-economic improvement, with a focus on the mitigation of rural poverty. The value addition and commercialization of NTFPs received the next highest priority score in this category. This implies that entrepreneurial development in value addition, value chain improvement, bioeconomic transformation, and commercialization of NTFPs plays a substantial role in people's

Table 5: SWOT categories, factors and their relative priority values

SWOT category	Weights	SWOT factors	Local weights	Global weights	Ranking
Strengths	0.500	S1: Rich NTFPs diversity	0.259	0.129	2 nd
		S2: Skill based on indigenous traditional.....	0.064	0.032	4 th
		S3: Feedstock for NTFPs based industries.....	0.167	0.084	3 rd
		S4: Income and employment diversification	0.510	0.255	1 st
$\lambda_{\max} = 4.25$, CI= 0.08, CR= 0.09					
Weaknesses	0.119	W1: Lack of institutional support.....	0.078	0.009	4 th
		W2: Poor processing, transport and storage....	0.158	0.019	3 rd
		W3: Seasonal subsistence and supplementary....	0.480	0.057	1 st
		W4: High labour intensive and less....	0.284	0.034	2 nd
$\lambda_{\max} = 4.11$, CI= 0.04, CR= 0.04					
Opportunities	0.319	O1: Domestication and production of NTFPs	0.160	0.051	3 rd
		O2: Value addition and commercialization.....	0.315	0.100	2 nd
		O3: Poverty alleviation and socioeconomic....	0.445	0.142	1 st
		O4: Supportive Government policy and.....	0.080	0.026	4 th
$\lambda_{\max} = 4.20$, CI= 0.06, CR= 0.07					
Threats	0.062	T1: Depletion of forest resources	0.155	0.010	3 rd
		T2: Climate change and climate variability	0.075	0.005	4 th
		T3: Competition from other growing.....	0.329	0.020	2 nd
		T4: Limited marketing infrastructure and.....	0.441	0.027	1 st
$\lambda_{\max} = 4.22$, CI= 0.07, CR= 0.08					

Table 6: Overall perceptions of the SWOT categories for internal, external, negative, and positive groups

SWOT categories	SWOT groups	Priority score	Perception (%)
Internal (SW)	Strengths + Weaknesses	0.619	61.90
External (OT)	Opportunities + Threats	0.381	38.10
Negative (WT)	Weaknesses + Threats	0.181	18.10
Positive (SO)	Strengths + Opportunities	0.819	81.90

livelihood diversification and economic empowerment. Domestication and production of NTFPs and supportive government policy and regulations were the low-ranked opportunities for NTFP entrepreneurship development, which reflects the NTFP stakeholders' low consciousness and familiarity regarding these opportunities. Extension and training for skill upgradation and extensive promotion and support through funding, finance, and subsidies by the Government are imperative for on-farm domestication and production of NTFPs. These findings are in line with the previous research of Shaikh *et al.* (2021) in Bangladesh, Mahonya *et al.* (2019) in South-west Malawi, and Zhu and Lo (2021) in the Greater Khingan Range in China, who discovered a direct linkage between the opportunities and NTFP entrepreneurship development.

Limited marketing facilities (local weight= 0.441; rank= 1st) was ranked as the topmost threat by the NTFP stakeholders, followed by competition from other growing economies (local

weight= 0.329; rank= 2nd) and depletion of forest resources (local weight= 0.155; rank= 3rd). Climate change and climate variability (local weight= 0.075; rank= 4th) was the least important threats, as opined by the NTFP stakeholders (Table 5). Basically, the marketing mechanism of the NTFPs is mainly individual-oriented and limited to the regional or state level, which restricts the stakeholders' access to the remunerative global markets. Poor marketing setup compels the stakeholders to sell off their NTFPs to local markets, middlemen, or wholesalers. Generally, all NTFPs hit the market in the peak season, limited to only 2–3 months, where the accrual of better prices becomes difficult due to competitive market conditions. Poor marketing infrastructure has always been a major constraint for NTFPs takeholders; thus, giving high priority to the limited marketing facilities evidences their sensible realizations. Competition from other growing economies was the second highest prioritized factor in the threats category, which directly hinders NTFP entrepreneurship development. Basically, crop cultivation and livestock production are the major



Fig. 4: NTFPs collection and processing.

components of livelihood, food, income and employment, while NTFPs are considered the third most important source among NTFP stakeholders. Depletion of forest resources and climate change and climate variability are other serious threats encountered by NTFP stakeholders, which have even constrained them from NTFP entrepreneurship development. The present findings find support from the earlier works of Ali *et al.* (2020) in the Northern Pakistan's Chaprote Valley, Shaikh *et al.* (2021) in the periphery of the Sundarbans Reserve Forest, Patharghata, Bangladesh, and Rahman *et al.* (2021) around the Khadimnagar National Park in North-eastern Bangladesh, who discussed the potential impact of threats in preventing the development of NTFP entrepreneurship. The internal factors (strengths + weaknesses) had a combined priority value of 61.90%, which was higher than the external factors (opportunities

+ threats), which had a combined priority value of 38.10% (Table 6). This is due to the fact that the impacts of internal factors are easily observable and assessable, while the effects of external factors are less evident and measurable among the NTFP stakeholders.

The NTFP stakeholders' overall perception of the prospects (81.90%), which comprised positive factors (strengths + opportunities), dominated the challenges (18.10%), which included negative factors (weaknesses + threats). This implied that addressing the prevailing challenges in the development of NTFP entrepreneurship can create a favourable environment for the strengthening and sustainability of NTFP entrepreneurship because, as the challenges decrease, the prospects of sustainable NTFP entrepreneurship are expected to increase. To create a favourable environment for the development of NTFP

entrepreneurship, potential strengths must be combined with crucial opportunities to eliminate significant weaknesses and threats in the direction of a new policy perspective.

In view of the existing limited NTFP businesses (Fig. 4), the formulation of a sustainable NTFP entrepreneurship strategy is imminent. However, before proceeding with any NTFP entrepreneurship change, it is imperative to address the major challenges and reinforce the important prospects among the stakeholders. In the studies conducted by Kukrety *et al.* (2013) on the Red Sanders wood trade, Szulecka and Zalazar (2017) on forest plantations, and Islam *et al.* (2020) on wicker handicraft entrepreneurship, the problem-solving SWOT analyses provide an informative overview and identify the important prospects and problems for multi-criteria decision-making on entrepreneurship, trade, or management. The inferences drawn from the studies by Szulecka and Zalazar (2017) on forest plantations in Paraguay and Etongo *et al.* (2018) on joint forest management in Southern Burkina Faso reflected the exact situation of the prospects and problems and gave a strong basis for strategic assessment using SWOT analyses for current situations and future development of their interventions.

Diagnostic analyses of the perceptions of SWOT (strengths, weaknesses, opportunities, and threats) for NTFP entrepreneurship development have become a fundamental element of multi-criteria decision-making in the Gurez valley of Kashmir. Low economic returns from NTFP and limited NTFP-based income diversification opportunities have postulated the search for the development of NTFP entrepreneurship. Promotion of sustainable NTFP entrepreneurship by involving NTFP stakeholders can create a win-win situation for both NTFP development and boosting rural livelihoods. This study evaluated the perceptions of NTFP stakeholders towards the development of sustainable NTFP entrepreneurship using the SWOT-AHP analysis framework. The findings proved that the prospects for NTFP entrepreneurship development prevailed over the challenges overwhelmingly.

The positive factors, including income and employment diversification, rich NTFP diversity, poverty alleviation and socio-economic development, and value addition and commercialization of NTFPs, were identified as the major prospects. These prospects are the key determinants that secure the probability of success for NTFP entrepreneurship development. All the NTFP stakeholders identified seasonal subsistence and supplementary income, high labour-intensive and less remunerative livelihoods, limited marketing facilities, and competition from other growing economies as major challenges associated with NTFP entrepreneurship. These challenges represent shortfalls of NTFP entrepreneurial setup and offer directives for future corrective actions. The findings provided a strong framework for decision-making and policy implications, focusing on prioritizing and addressing significant challenges while promoting the major prospects for the development of NTFP entrepreneurship.

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