A FINAL REPORT

ON

"Consulting Services for Feasibility study on status, Detail report preparation of refined center for Non timber forest products (NTFPs) and Medicinal and aromatic plants (MAPs) of Lumbini Province, Nepal".

(Part I: Status and feasibility analysis of MAP/NTFP based enterprises in the lumbini province)

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Status of NTFP and NTFP based enterprise management in Lumbini province: Final Report 2024

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Acronyms

ADB	Agriculture Development Bank
BFI	Bank and Financial Institution
CFM	Collaborative Forest Management
CFUG	Community Forest User Group
DCSI	District Cottage and Small Industries Office
DFO	Divisional Forest Office
DFTQC	Department of Food Technology and Quality Control
FBEs	Forest-based Enterprise
FenFIT	Federation of Forest-based Industry and Trade Nepal
FGD	Focus Group Discussion
FNCCI	Federation of Nepalese Commerce and Industries
FY	Fiscal Year
GDP	Gross Domestic Product
HR	Human Resource
Kg	Kilogram
KII	Key Informant Interview
MAPs	Medicinal and Aromatic Plants
MT	Metric Tonne
NPR	Nepalese Rupees
NTFP	Non Timber Forest Product
OCR	Office of the Company Registrar
SMEs	Small and Medium Enterprises

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2. EXECUTIVE SUMMARY

The Forestry Sector Strategy (2016-25) envisions to develop support mechanism for upgrading and sustainability of forest-based enterprises while ensuring private sector involvement and investment. The ongoing Fifteenth five-year development Plan (2019/20 – 2023/24) aims to promote forest-based industries through incentivizing private sector with concessional loan, insurance, storage facilities and other supports. Additionally, The Forest Policy 2076 (2019) targeted to increase employment opportunities through promoting green enterprises.

The contribution of the agriculture, fishery and forestry together to the Gross Domestic Product (GDP) is around 23.9% in 2021/22. While acknowledging the contribution of forestry sector in national GDP, it's potential has not been exploited and there are more opportunities to increase forest-based income and employment. The provincial Ministry of Forests and Environment, Lumbini commissioned the study to assess the present condition of NTFP/MAP based enterprises, including status of NTFP/MAP availability, and discuss on possible support mechanism to promote NTFP/MAP based enterprise in the Lumbini province. The study findings are expected to contribute towards national and provincial priority on NTFP/MAP-based enterprise promotion and detailing the strategies for financing NTFP/MAP-based enterprises in the Lumbini province.

The study was conducted during mid-April to May, 2024 using a mixed method involving consultative meetings with the forest officials, enterprise survey, key informant interviews, secondary data and literature review. All divisional forests officers and their team were consulted during the study. The consultation with selected MAP/NTFP based enterprises were organized to understand present business scenarios, constraints and bottlenecks and possible public support they expect from the government and non-government actors. Interviews notes were digitized, organized, and analyzed manually along with other forms of data. Analysis was made drawing additional insights from literature review and secondary information.

a) **Status of forest-based SMEs:** The study found that there are nearly three thousand forest-based enterprises (FBEs) in Lumbini province. However, not all enterprises are operational, as a reason, the number of currently in operation may be less. There are mainly five categories of MAP/NTFP based enterprises existed in the province, (i) essential oil, (ii) NTFPs based enterprises, (iii) *Kattha*, (iv) rosin and turpentine, and (v) broom grass.

b) **MAP/NTFP status (production and sale):** There are more than 80 MAP/NTFP species are in trade in the province. Out of these, four highly traded NTFP/MAP from Nepalgunj includes, 1) Tejpat (both bark and leaves), 2) Pine resin 3) Ritha 4) Malagiri (also *Cinamomum* species). The Nepalgunj data shows production three million kilograms of resin from the pine forests, whereas production of Tejpat leaves is more than four million kilograms. However, Nepalgunj trade is not only based on Lumbini province production, also trading from Sudur Paschim and Karnali province. Out of 12 districts in the province, six are in low land, mostly producing mentha, citronella type of essential oil-based species, and cultivated in privately owned lands. Trade of all species are not channelized within the government record system, as a

reason, government (DFO) database is found less than the actual production of species like Timur.

c) **Major MAP/NTFP species traded from Lumbini province**: Tejpat, Timur, Dalchini, Ritha, Bojho, Kali Kath ko Dana, Sugandhakokila, Padamchal, Kutki are major traded NTFP/MAP species from the hills and mountain areas of Lumbini province. Records from DFOs indicated that more than 580 thousand kilograms of MAP/NTFP traded from hills and mountain areas of Lumbini province in FY 2079/80. In low land districts, essential oil-based species such as Mentha, citronella are mostly cultivated.

d) **Public Support to major NTFP/MAP species for enterprise promotion**: There are ten species with high trade potential, a) *Essential oil* (Tejpat, Timur, Sugandhwal, Sugandhakokila from hill or mountain area, and Mentha, Citronella from low land cultivation). The assessment recommends for public investment capital for technology and machineries for essential oil enterprise with production focus on these species b) *Pine Resin* based Rosin and turpentine enterprise which is high capital investment and private sector already invested. Public support may include subsidized loan with longer pay-back period, machinery support from product diversification c) *Fiber based enterprise* (Allo and Nepali handmade paper) which could be supported through cooperative based enterprise model.

e) **Nepalgunj – MAP/NTFP trade hub**: Nepalgunj in Banke district of Lumbini province is found a major trade hub for MAP/NTFP in Nepal. Majority of the species, either in crude or processed from are traded to India with around 20% internal consumption within the country. There is already an established infrastructure for MAP/NTFP based enterprise with millions of investments from the private sector. However, the business in Nepalgunj still lacks modern technologies for product diversification, laboratory for quality control, and a good cold and storage house facility. The provincial government support on these areas within the already established enterprise will help to promote the NTFP/MAP based business.

f) **Subsidies, investment and Interest rate:** The present available bank loan is found around 13% interest which is not an encouraging for private sector investment in MAP/NTFP based enterprises, as the profit margin is not that high in this sub sector. Additionally, MAP/NTFP sectoral business is not included in government interest subsidy like in agriculture-based enterprises. The provincial government through its conducive policy provision can help to include the sector within the interest subsidy category. Additionally, any support on capital investment to private sector to enhance technologies, and facilities could positively impact on this business. The capital investment support is not recommended as a grant, rather, a subsidized loan with higher pay back period.

g) **Enterprise support modality under Inclusive Business model:** Based on existing production system, available possible capital investment within community-based forest user groups, and also potential for ensuring community stake on NTFP/MAP based enterprises, below two major modalities are recommended for public capital support in the sector.

i) ***Private enterprise:*** Based on consultation with major stakeholders and review of financial and business documents, published documents, the study recommends to support private sector enterprises through a number of policy and financial measures. Key policy and financial support to private sector businesses are discussed in chapter below. Public support includes, a) capital investment for technologies as subsidized loan with long payback period b) Tax subsidies c) reform on process and procedures such as company registration d) facilitation on buy back guarantee for smallholder producers.

ii) ***Cooperative based Enterprise***: There are 4023 community forest user groups, managing 423,618 ha of forests in Lumbini province. Out of 4023, concept of scientific forest management for productive forests has been applied in 226 CF. In addition, eight collaborative forests management blocks are under managed in collaborative model covering 22,559 ha of forests. These community-based forest user groups collected around NRs 340 million (NRs 340,103,152) in fiscal year 2079/80 which can be the available investment capital for NTFP/MAP based enterprise. The available capital investment available within CFUG/CFM groups need to be invested largely in enterprise promotion where the Ministry of Forests and Environment plays a facilitating role to maximize the benefits from NTFP resources.

3. INTRODUCTION

Nepal's forests cover almost 45% of the land (DFRS 2015) and significantly contributes to local livelihoods and national economy. The Ministry of Finance estimated that the contribution of the agriculture, fishery and forestry together is around 23.9% in 2021/22 (MoF 2022). FAO estimated that the forestry sector alone contributed to 3.5% of the Gross Domestic Product (GDP) in 1990, which linearly decreased to 0.6% in 2011. The estimation, however, has limitations due to unavailability of published statistics (FAO 2014) but shows a very low GDP contribution compared to the forest cover and available forest resources in Nepal. Another study estimated that the forestry sector generates 1,30,000 full time jobs (99,000 from private sector and 31,000 from community forestry user groups (MSFP 2014). Conservatively, the same study estimated that forest-based SMEs could generate more than US$ 8.7 billion and 1.38 million workdays through 400,000 sustainable full-time equivalent green jobs.

Forest supports different types of enterprises in Nepal, and significant capital is invested in this sector. The total estimated investment by private entrepreneurs in the forestry sector was about NPR 32 billion (USD 320.6 million[1]) in 2013 (excluding direct foreign investment in ecotourism), of which the highest investment came from the timber processors and manufacturers, with 59% of the total investment. The investment made in NTFP enterprises, ecosystem services (mainly ecotourism), and forest bioenergy is estimated to be about NPR 5.48 billion (USD 54.9 million), NPR 6.56 billion (USD 65.7 million), and NPR 42.9 million (USD 0.43 million), respectively (MSFP 2014).

While the demand for forest products has been increasing in the recent years, promotion of the existing and establishment of new enterprises, including small and medium enterprises (SMEs) have been generating income and employment for individuals at various nodes of the value chain, beyond production for instance, producers, collectors, investors, and processors among others. In some cases, the benefits are limited to certain seasons in a year, while for others, the enterprises operate throughout the year. Moreover, forest products vis-à-vis forest-based enterprises (FBEs) are reported to support the resilience and livelihood enhancement of

1 USD 1 = NPR 99.8 for year 2013 (Source: Nepal Rastra Bank)

local communities in various regions of the globe (Cavendish 2000). SMEs play a major role in economies in developing countries. They represent about 90% of businesses and more than 50% of employment worldwide. Further, formal SMEs contribute up to 40% of national income (GDP) in emerging economies. It has been estimated that 600 million jobs will be needed by 2030 to absorb the growing global workforce, which makes SME development a high priority for many governments (The World Bank, undated).

Non-timber forest products (NTFPs), usually referred to as minor forest products, are any goods that can be obtained from a forest that are not wood (Ahenkan and Boon, 2011). NTFPs are considered important globally as they can contribute to proper nutrition as well as food security. Global sales of Plant-based pharmaceutical goods are dominated by the Asian and European markets, with an average of US$20 billion sold annually (Greunwald,1999). Nonetheless it is improbable that a solitary medicinal plant product can yield revenues exceeding a few hundred million dollars, with the majority of sales occurring for less than US$ 10 million annually (Laird and Gullen,2002). They are vital in adding income to the families, thus improving rural livelihood. In rural indigenous communities, they may be able to guarantee food insecurity and lessen malnutrition (Shrestha, 2020).

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NTFP based enterprises that have high foreign demand can contribute to national income as well. NTFPs promote conservation activities and support biodiversity (FAO, 1995). NTFPs offer an opportunity to practice sustainable forestry in conjunction with agriculture. This can alleviate the local pressure to overharvest timber. Developing countries can benefit largely from the employment and income generation from NTFPs and this holds the potential to alleviate rural poverty (FAO, 1993; Ghimire, 2006). According to several studies (Wiersum and Ros-Tonen, 2005; Mukul et al., 2010; Kar and Jacobson, 2012), one of the most important ways to promote sustainable forest management and strengthen the local economy is through the use and promotion of non-timber forest products.

In Nepal, many tree species can be grown that give multiple products (Khanal, 2006). Diverse landscape of Nepal ranging from tropical climate of the Terai to the alpine tundra of

the high Himalayas has made it suitable to grow a variety of NTFPs. NTFPs, mostly Medicinal and Aromatic Plants (MAPs), are considered high value commodities. Medicinal Plant species play a major role in the traditional healing systems found in developing nations, which have been long ingrained in the history and cultural traditions of the populace. They have been particularly useful in rural areas of country like Nepal where the majority of people roughly 80% receive their primary healthcare (WHO 2011, UNEP 2012, Sathiyaraj et.al 2015).

While the total impact of the forestry sector to national GDP at present is approximately 15 percent (Banko Janakari, 2004), NTFPs alone are estimated to contribute 5 percent to the national GDP (ANSAB, 1999). As a result, there are now more plant species with ethnobotanical values. The Medicinal and Aromatic Plant Data Base of Nepal (MAPDON) includes 1624 species recognized as having ethnobotanical worth (Shrestha et.al,2000). According to Rawal 2004 (quoted from Malla and Shakya, 1984), Nepal's flora includes approximately 1000 economically significant species (14% of the nation's vascular plants), including 440 species of wild food plants, 71 species of plants that yield fiber, 50 species that are used as fish poison, and 30 species of trees that yield fodder. Out of these, over 100 MAP species are now being used for profit. Approximately 189,000 people work in this subsector, contributing between 15% and 50% of their household income, according to ANSAB (Asia Network for Sustainable Agriculture and Bioresources) (Karki and Bhattarai, 2012; MSFP, 2014). According to the Department of Forests (2016), NTFPs contributed 6.56% of the royalty received from the forest sector. Nepal trades about 150 NTFPs on the global market (Shrestha et al., 2020). Nepal trades around 10,000 to 15,000 tons of NTFPs annually in the international market. Edward (1996) also made reference to the harvesting of over 100 different species of non-timber forest products (NTFPs) from Nepal's high mountains and mid-hills, which are primarily exported to Indian markets. Nepal's tropical zone (below 1000 m) has 49% of the country's MAPs, followed by the subtropical region (1000-2000 m), temperate region (2000-3000 m), sub-alpine region (3000-4000 m), and alpine region (above 4000 m) with 7% (Malla and Shakya, 1986). The high mountains command higher prices because of their high value (potency) but low volume NTFPs. The number of NTFPs in Nepal is estimated to be greater than 700 plant species (Khanal, 2006). Nepal trades around 10,000 to 15,000 tons of NTFPs annually in the international market. These NTFPs represent around 100 species. Most of the NTFPs (95%) are collected from the wild and most of the

collected NTFPs are exported to India (90%) for processing in raw form. Amala (*Phyllanthus emblica*), Atis (*Aconitum heterophyllum*), Chiraito (*Swertia chiraita*), Tejpat (*Cinnamomum tamala*), Guchhi-chyau (*Morchella conica*), Jatamansi (*Nardostachys jatamansi*), Jhyau (*Parmellia* species), Kutki (*Picrorhiza kurroa)*, Pipla (*Piper longum*), Ritha (*Sapindus mukorossi*), Sugandhawal (*Valeriana officinalis*), Sugandha-kokila (*Cinnamomum glaucescens*) and Timur (*Zanthoxylum armatum*) are the major NTFPs traded to India (Poudel, 2007). NTFPs traded are used as food, spices, condiments, herbal medicines, bast fibres, fodder, leaf litter, manure, tannins, dye stuffs, gums, resins, incenses, aromatic herbs, oils, rattan, canes, bamboos, and construction materials (Edwards, 1996; Shrestha, 1999). The price received by NTFP harvesters in Nepal is, on an average 32 percent of the final price given by Indian industries raw materials (Edwards, 1996).

Limited research and assessment have been done on various aspects of commercializing NTFPs in Nepal because individuals extract NTFPs from the wild and trade it via different marketing channels and multiple traders (Kanel, 2000). Due to the exploitation of forest products in an unscientific way, there has been a decrease in Nepal's NTFP base. Lack of good supervision and management in collecting and trading NTPFs has made them vulnerable to extinction (Acharya, 2000). Besides, there is a lack of systematic analysis on NTFP based processing units to ensure sustainable supply of processed products. Also, the fact that ongoing processing units are managed in small scale and without utilizing their optimum capacity to produce value added NTFP products. Majority of processing units are either managed by CFUGs in a smaller scale, or private sector in the Lumbini province.

In this context, the provincial Ministry of Forests, Environment and Irrigation aims to organize an in-depth assessment on existing scenario on availability of NTFP within the province, and suggest possible large scale processing unit with operational modality.

4. STUDY AREA AND METHODOLOGY

4.1 Study area

The assessment primarily focused on Lumbini province, where all districts are were selected for this assessment. ed for the study. Existing status and condition of NTFP/MAPs, volume of NTFP trade from each district, export status of major NTFPs to Indian market were

assessed using available data from division forest offices, private sector entrepreneurs, community-based forest user committees.

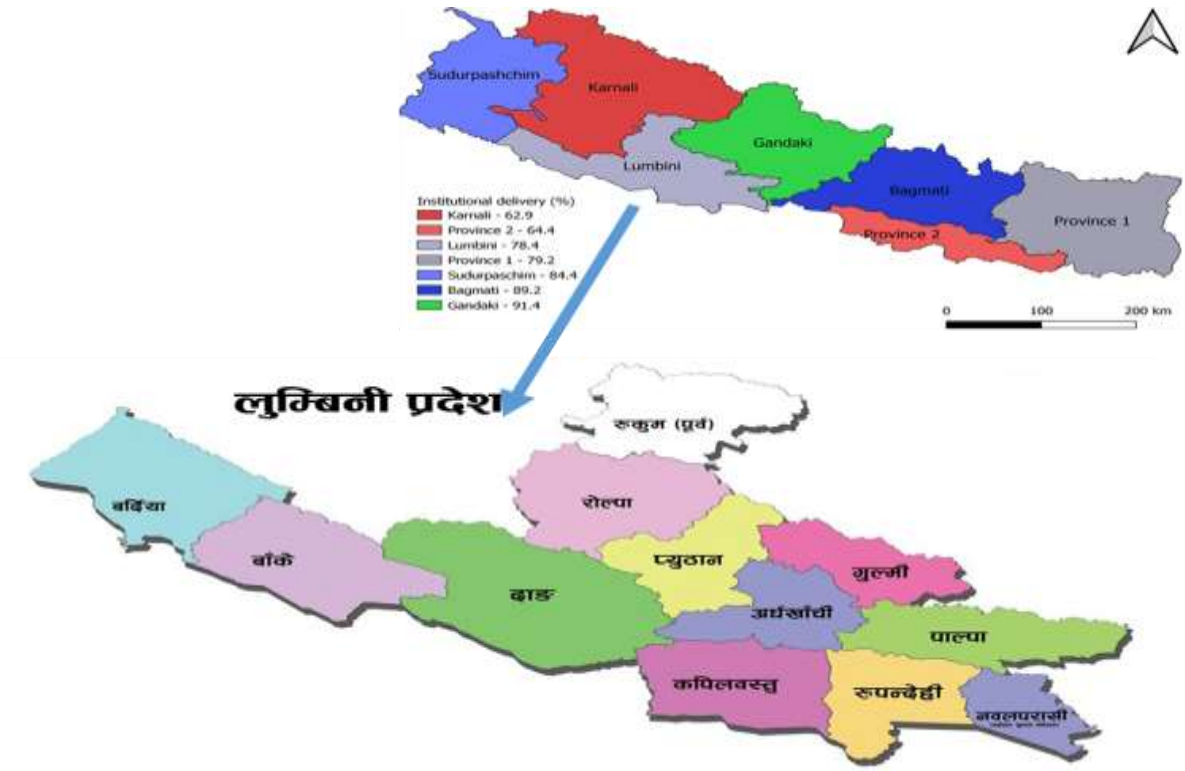


Figure 1 : Lumbini province with districts

Lumbini province has a of 13.1% of Nepal's GDP. Overall growth rate at purchase price is 7.5% for Lumbini compared with the national average of 7.1%. The agriculture and forestry sectors (combined) have a 16% share in Lumbini province (CBS 2019).

According to the Human Development Report for 2019, the Human Development Index (HDI) of Lumbini Province is 0.563 which is slightly lower than the national average value of 0.587 (NPC 2020). Likewise, in 2019, Lumbini Province has the fourth highest multidimensional poverty index (MPI) at 0.078 which is above the national MPI of 0.074 (NPC 2021).

Database available from the District Cottage and Small Industries Offices, the number of forest-based enterprises (FBEs) in Lumbini province are 3,385 (Development Vision Nepal, 2022). However, all these enterprises are not functional at the time of this assessment.

4.2 Methods

4.2.1 Approach

The study followed a consultative approach. All divisional forest officers and DFO officials were consulted either in person or virtual. Consultative meetings were organized with the provincial ministry of forests, environment, and irrigation including provincial secretary and

officials responsible in planning. Similarly, consultations were organized with the provincial forest directorate, forests for prosperity officials. Apart from government officials, consultations with private sector entrepreneurs, members of community-based user groups and NTFP business houses were organized.

The study commenced with a meeting with provincial secretary- forests and environment to receive feedback and finalize on the set of objectives of the study, and the methodology proposed.

4.2.2 Desk review

Publications of Ministry of Forests and Environment, provincial ministry, and associated divisional forests offices were reviewed to understand the NTFP/MAP related policies and provisions. These publications include, but not limited to, annual plans, five-year forest sector strategy, forest database. Major policy and legal documents reviewed included Constitution of Nepal 2015, Forestry Sector Strategy (2016-2025), Local Government Operation Act 2017, Nepal National REDD+ strategy 2018, Land Use Policy 2019, Forest Act 2019, National Forestry Policy 2019, National Agroforestry Policy 2019, Climate Change Policy 2019, Fifteenth Plan 2076/77-2080/81 (2020), The Industrial Enterprises Act 2020 and Nepal's Second Nationally Determined Contribution (NDC) 2020. Likewise, annual plans of provincial forest ministry, Division Forest Offices, the Small and Cottage Industry and Office of the Company Registrar were reviewed during the survey.

The review disclosed that most of the policy and legal documents mention to promote mass scale production, enterprise development, and sustainability. Despite these enabling policies, the progress is very slow. The major reasons are: multiple registrations, practical difficulties to comply the policy (e.g., waiver of royalty for cultivated species), the *ad-hoc* based quota system for forest products and so on. The review also showed that coordination with three levels of government and the private sector is needed to achieve prosperity from forests.

4.2.3 Consultative meetings and Key Informant Interviews

A consultative meeting with the officials from provincial Ministry of Forests, Environment and Irrigation was organized to review terms of reference, agree on methods and methodology, and assessment process. Similar meeting was organized with the officials from provincial forest directorate. These meetings provide clear guidelines on methods, methodology, assessment process and stakeholders identification during the feasibility assessment.

Similarly, consultative meetings were organized with divisional forest officers, or their representatives. The consultant team visited all districts (except east Rukum) to discuss with DFOs, and access quantitative data on NTFP/MAP from each district. Meeting with DFO-east Rukum was organized virtually. In addition, the team also access data available on existing processing units, their status and operation modality. Consultations with DFOs,

private sector entrepreneurs help to understand present status of NTFP/MAP, enterprise operational modality for proposed NTFP processing unit.

Key informant interviews with NTFP based entrepreneurs, such as JABAN, processing unit owners, CFUGs and relevant stakeholders were organized to understand market and value chain of selected NTFP/MAP species. These interviews provide qualitative information and data on status of existing processing units, operation modality of processing units, and existing NTFP trade scenarios.

Report Presentation and Validation:

A final presentation was organized with the stakeholders from various provincial ministries, including MoFE, Ministry of Industries, Ministry of Finance. Comments and suggestions from this stakeholders' workshop are incorporated in the report. Annex X provides list of participants on provincial stakeholders' workshop.

4.2.4 Data Collection/ Secondary Data

Source of Data and Data Collection

The list of NTFP/MAP based enterprise was obtained from Office of the Company Register (OCR), District cottage and small-scale industries and DFOs. The list was used to classify NTFP/MAP enterprise based on the types of raw materials used and the products these enterprise manufactures. Accordingly, the enterprises were categorized as following:

- *Kattha*
- Rosin and turpentine, pine products
- Essential oils
- Ayurvedic products
- Honey
- Other NTFPs based enterprise (*Allo*, handmade paper, broom, Tejpat raw leaves)

Interviews were conducted with the forest-based enterprises of the above-mentioned category in selected districts of the province.

Interviews and Checklist for Interviews

A total of 16 NTPF/MAP based enterprises in the province were interviewed using the checklist. The checklist has nine headings: (i) general information, (ii) understanding the product/key offerings, capacity, and utilization levels, (iii) raw material supply, (iv) market demand, (v) cost of production, (vi) financial details, (vii) knowledge on loan, grants and

subsidies, (viii) legal aspects, and (ix) risk analysis. Elaborated checklist is given in annex 1. Given below is the summary of interviewed FBEs.

Table 1: Selected enterprises interviewed

Districts	Bael, Honey	Essential oils	NTFPs (paper, broom)	Katth a	Rosin / Turpentine / Pine	Ayurvedic	Others (nursery, handicraft	Total
Nawalparasi –West		1						1
Rupendehi	1			1	2			4
Palpa		1				1		2
Kapilbastu		1						1
Dang	1		2				1	4
Pyuthan	1							1
Banke		1					1	2
Total enterprise visited and interviewed								**15**

The respondents were asked for their consent to take part in the survey. Once the verbal consensus is received, interviews with the respondents were conducted using the checklist.

4.2.5 Secondary Data Collection

Secondary data on NTFP/MAP availability, trade was obtained from divisional forests offices and private sector association such as JAWAN in Nepalgunj. Available data is primarily based on DFO records and issue permits. Production from private lands was also collected from local MAP/NTFP business person/vendors. However, amount of MAP/NTFP production in private land may not be fully covered. This is particularly because of the fact that district level trade of few NTFP/MAPs, such as broom grass, *Tejpat* is not recorded in DFO database. Therefore, production of few NTFP/MAP species may be more than the amount presented in this report.

Photo 2: Consultation with Forest Officials

5. STATUS OF NTFP/MAP-BASED ENTERPRISES

5.1 NTFP/MAP based enterprises in Lumbini provinces

List of NTFP/MAP-based enterprises were obtained from multiple sources, including office of the company register, small and cottage industry office, Divisional Forest offices. The list is not comprehensive and accurate as many of the registered industries are not functional. In addition, there is limited monitoring and update from government entities. There are 231 forest-based industries registered within the Company Register Office in Lumbini province. However, 3,385 forest-based industries are registered in small and cottage development office (Development Vision 2022). As most of the micro and cottage industries are registered only in DCSI, the number is much higher in DCSI record. Table 2 gives and overview of forest-based enterprises, including NTFP/MAP based enterprise in the Lumbini province.

Category	Number of Enterprise
Sawmill	823
Furniture	1264
Nursery and agroforestry	89
Medicinal Plants	43
Handicrafts	52
Other forest-based enterprises	163
Total	**2434**

Table 2: Category wise number of Forest based enterprise in Lumbini Province

Source: DCSI 2021, cited from Baseline survey report (Development Vision 2022)

5.2 Legal provisions on forest-based enterprises

National Forest Policy 2019 highlights and focus on sustainable production and promotion of green enterprises. The policy also focus on commercialization and forest products export is primary focus to create green sector jobs contributing to national economy. The Forest Act 2019 envisions to promote forest-based enterprises while the Industrial Enterprise Act 2020 identifies forest-based enterprise as a nationally prioritized enterprise to provide tax incentives and other facilities from the government.

The policy of Nepal Rastra Bank is to allocate at least 10% loan to the agriculture sector including NTPF/ MAPs/herbs farming and businesses (Paudyal et al. 2021). In mid-July

2022, Nepal Rastra Bank revisited the policy and instructed all commercial banks to provide at least 12% of the total credit to the agriculture sector, including herbs/MAP sector. With this policy, commercial banks disbursed 12.28% of total credit i.e. NPR 490.15 billion to the agriculture sector by mid-April 2022.

The Government of Nepal is providing interest subsidy to different types of loans. Among others, commercial agricultural and livestock loan, women entrepreneurship loan, deprived sector loan and youth self-employment loans are the types of loans that government is providing subsidies on. Till mid-July 2023, government has provided interest subsidy worth NPR 22390.8 million to 145,778 loan seekers/borrowers under 10 different types of loans[2].

Major policies and legislative instrument relevant to MAP/NTFP enterprise, such as forest sector policy, discussed on promotion of mass scale production, enterprise development, and sustainability. Despite policy discussion, the MAP/NTFP based enterprise development is getting limited progress which may be because of provision on multiple registrations, practical difficulties to comply with the policy (e.g., waiver of royalty for cultivated species), the *ad-hoc* based quota system for forest products. The review also showed that coordination with three levels of government and the private sector is imperative to achieve prosperity from forests.

The government initiatives and policies have primarily focused on promotion of community-based conservation and fulfilment of their subsistence needs, undermining the focus towards promotion of enterprises (MSFP 2014b). Similarly, interpretation of the policy, legal and institutional framework has affected administrative procedures for harvesting MAP/NTFP harvesting, processing, transport, and marketing for forest-based enterprise and thus their operation and management (MSFP 2014a).

Several legal frameworks such as the Cooperatives Act, 1992; the Companies Act, 2006; the Industrial Enterprise Act, 2016 and 2020; and Local Government Operation Act, 2017 provide legal basis and offer opportunities to register forest-based enterprises of different institutional modalities: cottage, micro, small, medium and large industries, cooperatives and private limited companies. These multiple provisions are, therefore, confusing entrepreneurs and takes longer time to follow the procedural guidelines which ultimately discourage MAP/NTFP based enterprise development in Nepal.

In Lumbini province, while Municipalities are registering cottage and micro industries, provincial authorities are reluctant to recognize their legal status. Also, frequent merger and separation of the Provincial Ministries of Industry and Forest have also affected these service centers. There are challenges in regards to the time taken, and cost association with the registration process for forest-based enterprises, irrespective of the institutional modality

2 https://www.nrb.org.np/contents/uploads/2023/08/Interest-subsidized-loan-to-be-published-Asar-2080.pdf

(Adhikary and Paudel 2020). One of the other challenges, and perhaps a serious issues faced by small-scaled forest enterprises is the legal provision regarding the distance that is to be maintained between them and forested areas. In Lumbini Province, minimum distance from forest area is set based on specific bandwidth of sawmills (500 meter for above 36-inch, 300 meters for 18 – 35 inch, and 250 meters for less than 18 inch) (Lumbini gazette *Rajpatra* 16 Sept, 2022).

In recent years, especially after the implementation of federal governance structure, tax on forest products has substantially increased. Before, there was 15% royalty and 13% VAT. Now local governments are allowed to impose a separate 10% tax (LGO Act 2017). On top of this, provincial governments have imposed separate tax (e.g. 25% in Lumbini province). At the same time, the government has substantially increased the royalty rate (Forest Regulations 2022: Annex 6). This has created a confusion among the entrepreneurs who often face the burden of multiple-taxation, especially in case of NTFPs (Timsina et al. 2021).

Other than VAT, royalty and local government taxes, following are the amount collected by government of Nepal during business operation. They included, but not limited to, (i) payment for registration of enterprises, (ii) payment for getting recommendation for enterprise registration from ward/municipality, (iii) payment for approval on setting up structure from municipality, (iv) Excise tax (the Excise Act 2001 imposes excise duty on the products of Kattha, wine produced from wild fruits, and the wine mixed with the extraction of NTFPs/MAPs; and (v) customs duty.

While exporting from Nepal, the documents namely (i) payment of all relevant taxes including local tax, (ii) plant quarantine certificate, (iii) certificate of origin and (iv) CITES certificate for CITES listed species are required. Additional regulations in the importing country to meet phyto-sanitary, human health, environmental codes, and international treaty obligations may also apply.

There are however some special considerations for FBEs. Income tax act 2001 has a provision of tax exemption in the production and marketing of forest products and the Financial Act 2013/14 has provided tax exemption in land registration for NTFP farming and processing.

6. FINDINGS

6.1 Investment based categories

There are mainly five types of MAP/NTFP based enterprises exists in Lumbini Province a) essential oils, b) NTFPs based (including handicrafts), c) honey, d) Kattha,, d) rosin and turpentine and e) innovation based enterprises. Based on key informant interviews, the nature of these different types of enterprise is different in terms of investment, and scale of operation.

This is important to understand the cash flow, possible rate of return, and scale of operation, and therefore, needs to categorize these enterprises in terms of their investment and operation modality. Investment on these-enterprise varies from less than a million to more than 100 million. In line with the assessment scope of work for possible provincial support to these enterprise, four major categories are discussed in table below based on their scale of investment.

Table 3: Types of enterprises based on investment and nature

Types	Investment (in NPR)	Nature	Categories
Type 1	Up to 2 million	Production node entrepreneur, non-formal skill-based work	Essential Oils, NTFPs based, Honey, handicraft
Type 2	2 – 20 million	Serving to local and district market, Single function	Essential Oils, NTFPs based, Honey
Type 3	20 – 100 million	Serving national market, Multiple business function and medium sized	Essential Oils, NTFPs based, Honey,
Type 4	100 million and above	Large Industries	*Kattha*, Rosin and Turpentine, Ayurvedic Medicine
Innovative	Vary as per Innovation	New product or process in market, yet to see its positioning in market	Farm Cultivation of specific species, Product specific business

Additional information on each type of these enterprises is discussed in relevant section below and also provided in Annexes.

6.1.1 Essential Oils

Nepal's rich biodiversity is home to more than 2,300 species of medicinal plants (including fungi and lichens), out of which 300 species are in trade (Rokaya et al. 2012; Pyakurel et al. 2019). The export value of medicinal herbs for FY 2021/22 was NPR 1.7 billion. Essential oils are produced from more than 40 medicinal plants species, out of which the most common native species for essential oils production are Jatamansi (*Nardostachys jatamansi*), Sugandhawal (*Valeriana jatamansi*), Tejpat (*Cinnamomum tamala*) and Timur (*Zanthoxylum armatum*). Likewise, the most common exotic species for essential oil production are Mentha (*Mentha arvensis*), Chamomile (*Matricaria chamomilla*), Lemon grass (*Cymbopogon flexuosus*), Palmarosa (*Cymbopogon martini*) and Citronella (*Cymbopogon winterianus*). The major market for all exotic essential oil yielding plants (Mentha, Chamomile, Citronella, Lemongrass) is India, whereas essential oils from Jatamansi and Sugandhawal is exported to India and European Countries.

According to government records (TEPC[3]), Nepal exported 51.4 tons of essential oils worth, NPR 764.7 million (USD 6.34 million[4]) in FY 2021/22. The government record, however, does not include the export of Mentha and Lemon grass that are directly exported to India using the porous border. The study team discussed with a farmer's group cultivating Mentha in Banke district. The group confirmed the existing unregulated market and NTFP/MAP trade with the statement "*We do not have any confirmed buyer. Whenever, we get higher price, we sell to Nepalgunj based exporters- both in cash and in credit. Sometimes, Indian buyers directly come to us with cash payment."*

The statement from local farmers further confirmed that there is an unregulated market and trade, which does not often come to the government system and database. This is somehow difficult to trace the volume of unregulated trade of NTFP/MAP to Indian market, however, can be estimated to some extent.

Nepalgunj is the major NTFP/MAP hub for Nepal with a number of processing center for medicinal plants and essential oil extraction. The Jadibuti Association of Nepal (JABAN), an association of NTFP/MAP entrepreneurs is active in MAP/NTFP based business and export to India. In 2020/21, Jatamansi oil (2697 kg), Sugandhakokila oil (900 kg), Sugandhawal (591 kg) were the major native essential oils exported from Nepalgunj (JABAN, 2022)

The study team consulted five MAP/NTFP enterprises in Lumbini province, out of them, five are owned by individuals and one owned by community forestry user groups. In addition to these entrepreneurs, the team also consulted a farmers' groups in Raptisonari Rural Municipality, Banke. This farmer group has been cultivating Mentha in their farmlands.

3 http://www.tepc.gov.np/news_events/full_story/nepali-post-27
4 USD 1 = NPR 119.88 for Fiscal Year 2021/22 (source: Nepal Rastra Bank)

Photo 3: Broom grass cultivation

4.1.1.2 The essential oil value chain

Raw material supply and market chain:

Farmers mostly cultivate essential oil yielding plants in their farmlands in low land of Lumbini province. The most common cultivated MAPs in lowlands are Mentha followed by Lemon grass, Citronella and Chamomile. In some places, such as in Banke district, farmers form their essential oil production farmers association which not only help them in price bargaining but also share their experiences on essential oil cultivation and marketing strategy. Timur and Tejpat are cultivated in the hilly areas of Lumbini province (e.g., Tejapt in Palpa, Timur in Dang, Pyuthan, Rolpa, Rukum-East). They are mostly cultivated in the edges of farmlands.

There are two major trade system for essential oil existed in the Lumbini province. 1) Contract farming by lead entrepreneur where a lead entrepreneur undergoes with a contract farming with farmers and provide technical support and seedlings. Once crop is ready to harvest, farmers take it to the nearby processing unit for distillation. Farmers are paid based on amount of oil distilled, 2) few farmers are growing medicinal and aromatic plants at their own, and distillation is done in nearby processing plant paying the distillation fee. The distilled oil is then traded to Nepalgunj or nearby market based on existing market value.

Jatamansi and Sugandhawal oil do have conventional market chain. The raw Jatamansi and Sugandhawal are harvested by local harvesters, sell to village level traders and then to district level traders. The district level traders sell raw plants to Tarai based processors who process and extract essential oils. The market chain for Timur oil is almost similar to jatamansi and Sugandhawal.

There are two entrepreneurs (Hasan Herbal in Banke and Natural Product Industries, Kapilbastu) purchase essential oil yielding native plants (Jatamansi, Sugandhawal) from the hilly and mountainous districts of Karnali and Sudurpaschim province and process in their factory. Other entrepreneurs also purchase native medicinal plants from hilly and Himalayan districts and process them in the Tarai cities.

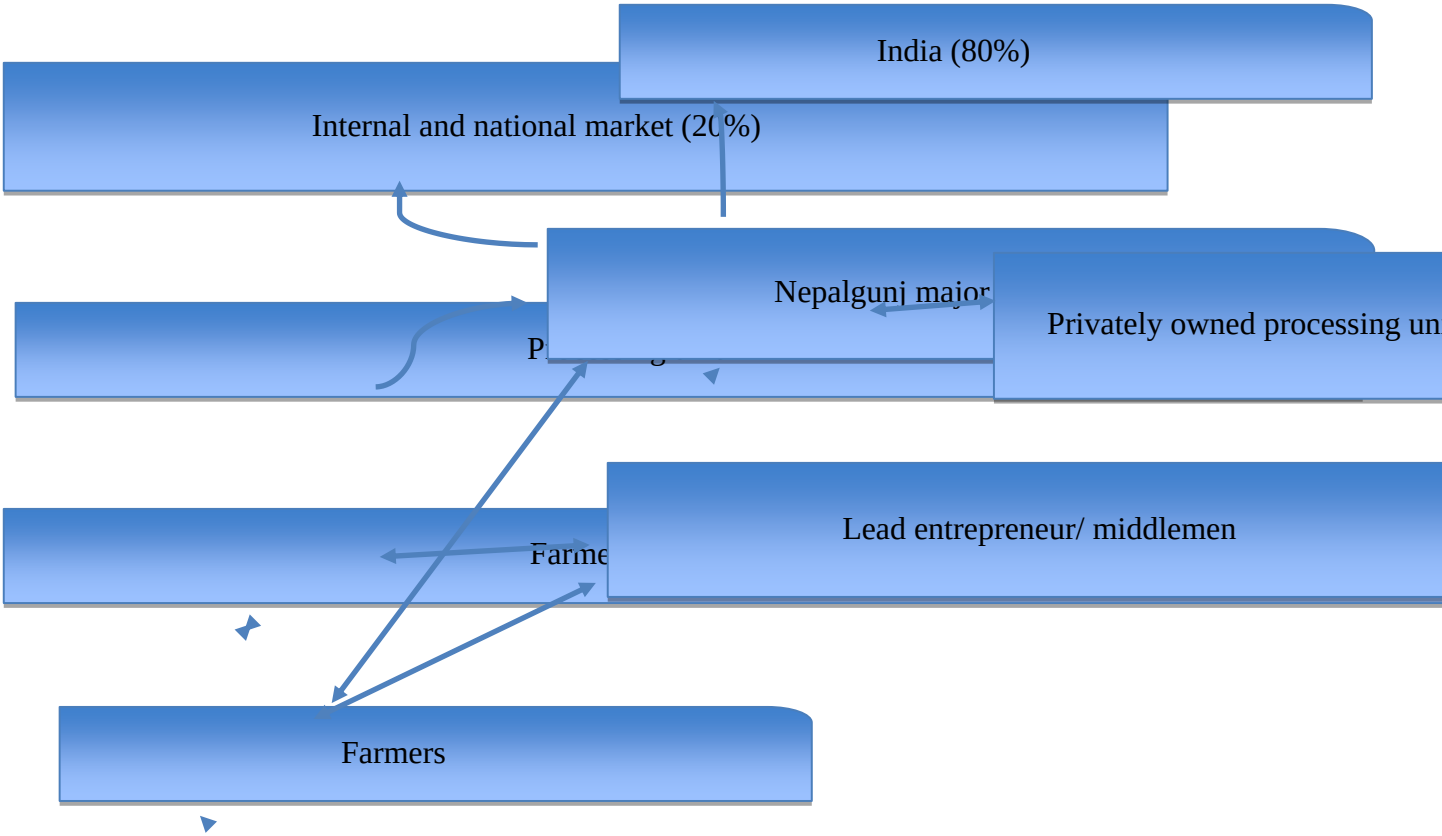
These essential oils (Jatamansi, Sugandhawal, Timur) are generally exported to India. Essential oils from exotic plants are also exported to India followed by use in domestic market, the domestic consumption of these extraction is very minimal.

Photo 4: Dalchini water product

<u>Other actors:</u>

The trade in essential oils encompass a wide range of non-firm actors who regulate and facilitate the trade. Division Forest Officers facilitate the trade by issuing the collection and harvest permits (for wild harvested medicinal plants). Different NGOs/CSOs are providing a wide range of services e.g., providing the funds for the installation of essential oil units

providing the technical supports, facilitating the trade. The simple value chain of essential oil is presented in below diagram.



Growing MAP in their farms (such as mentha), Collecting wild MAP (such as Sugandhawal)

Key issues, Challenges and Possible action to address challenges

There are number of issues and challenges in promoting essential oil-based enterprise in Nepal, and Lumbini province in specific. These challenges are ranging from sustainable supply of raw materials to the legal procedures. Below key issues and challenges with possible ways to mitigate these challenges in essential oil sub sector in Lumbini province.

- **Availability of wild harvested species/ raw materials**: Sustainable supply of wild MAP species is major challenge in promoting essential oil sub sector. There is a tendency of unsustainable harvesting at the community level, as a reason, the Government of Nepal through provincial forest ministries and division forest offices allocate harvest quotas for medicinal plants. The harvest quota is particularly imposed to restrict over and unsustainable harvesting of wild species, which limits the availability for processing essential oil.

    - Sustainable management of high-altitude species, including rotational harvesting (e.g., Jatamansi) and commercial level cultivation of mid-altitude species (e.g., Timur) are major interventions to ensure sustainable supply of raw materials
- **Limited knowledge on market and marketing (Community processing owners):** Essential oil processing units owned and operated by communities have limited knowledge on market and marketing with business planning. This resulted limited capacity on price bargaining with large scale entrepreneurs.
    - Community owned processing units are operating without business plans. There is a strong need business planning orientation to CFUGs who are operating essential oil processing units. Additionally, a proper business plan needs be there where technical advice is critical to communities.
- **Large scale enterprise needs external support on investment, branding and trade facilitation**: Large essential oil entrepreneurs need additional investment support to upscale their business. The support includes, capital investment for storage house, facilitation for branding and external trade, particularly to India. Inclusive business concept where smallholders be engaged with large scale traders while ensuring benefits to small holder producers could be more effective way to promote privately owned essential oil business.
    - Low interest rate capital loan support, indirect subsidy through tax exempt, and branding support could help privately owned essential oil business.

6.1.2 Scale of operation and Types of Essential Oils Enterprises

The essential oil sub sector can be categorized in three major categories based on their investment and area of action. The study team assessed five essential oil-based enterprise in the province, and based on key discussion with entrepreneurs, they are categorized as below.

Type	Major focus	Investment (Nrs)
A	MAP plantation and seasonable distillation (mostly owned by CFUG)	Up to 2 million
B	Plantation, collection, and year around distillation	2 to 20 million
C	Phytochemical extraction, and niche products	More than 20 million

Essential oil enterprises assessed in Lumbini province

The study team assessed the selected essential oil-based enterprise in Lumbini province, and suggest to support existing essential oil processing units to upgrade its capacity with laboratory facilities instead of investing on new enterprise.

S.N.	Essential Oil Subsector	Types	Nature	Investme	Profit Margin

	Based Enterprises			nt (NPR)	in percentile*
1	Mentha Kheti Tatha Jadibuti Sanjal Samiti, Lubmini, Banke	Type A	MAPs plantation and seasonal Distillation	5-10 Lakhs	Above 30%
2	Chisapani Community Forestry, Lumbini Nawalparasi	Type B	MAPs plantation and Seasonal Distillation	10-20 Lakhs	Sustaining
3	Jadibuti Samrakchyan Tatha Upayog Sahakari Sansthan, Palpa	Type B	Planation/ Collection and Distillation	30 Lakhs above	Sustaining
4	Hasan Herbal Industries, Lumbini, Banke	Type B	Plantation/ Collection and Distillation	10 million	20%
5	Natural Product Industries, Lumbini, Kapilvastu	Type B	Plantation/ Collection and Distillation	20 million	N.A.

Note*****: Profit margin is discussed here based on the response from entrepreneur, with limited available cash flow analysis.

Essential Oil Calendar

All MAP species are either cultivated in private land/ community and, and/or harvested from wild habitat in natural forests. Private land cultivators are found with clarity on opportunity costs/benefits of such plantation in privately owned land, however, community land (mainly CFUG) owners often lack proper good practices and norms. Wild collection is mainly done in hilly and mountain districts of Lumbini province such as east Rukum. The generic MAPs crop calendar is presented below.

Crops	Crop Calendar for different variety of Essential Oil											
	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Mentha												
Chamomile												
Lemongrass												
Citronella												
Eucalyptus												
Tejpat												

Table 3: Crop Calendar for major essenital oil yielding crops

6.1.3 Cash Flow, Finance and Financial decision

Based on the response from farmers and private entrepreneurs, there are critical issues need to understand while promoting essential based enterprise, and investment required to promote such enterprises. Below major issues which are helpful to take financial decision to promote essential oil-based enterprise while maximizing benefits to smallholder farmers.

- There is an opportunity costs/benefits while doing essential oil farming over traditional crops for smallholder farmers. In general, smallholders' farmer cultivates essential oil when major crops are not cultivated, which provide them additional benefits. In low land of Lumbini province, Mentha is most popular crop cultivated during the time where major crops are not planted. It is essential to make farmers aware on such combination of crops.

- Cultivation of MAP species throughout the year in community forests land is the practice in some areas of the province. While, cultivation within community forests may not follow cultivation good practices, the yield may not as compare to privately grown. As a reason, farmers affiliated with the CFUG may be losing benefits from cultivation of these species. This is important that technical support on agriculture good practices to the members of CFUG be provided to maximize the production.

- Wild collected MAPs are mostly traded to India within its raw format. This is particularly because that the farmers need cash, and also avoid procedural requirements. The existing regulation allows such trade of many species, with limitation on selected species which need to be proceed before trade to third country. There is an opportunity to support high tech processing for value addition of all species to ensure maximum benefits.

- The finance requirement for Type A is mainly for production cycle for each of MAPs. Type B requires finance while buying raw MAPs or essential oils in relation to harvesting, and type C financial requirement is buying bulk at the time of harvesting

- The relation of Type A to Type B are critical as per certain MAPs the distance for harvesting and distillation need to be maintained within 2-3 hours.

Cash Flow Analysis (based on Type B enterprise and Indicative)

The study team analyzed cash flow for essential oil-based enterprise with a focus on type B enterprise. This analysis is based on response from the entrepreneur and limited account and cash flow documents review, and therefore, taken as an indicative for medium sized essential oil-based enterprise promotion in the province. Average profit margin is around 12%, however, could be more as the study team do not have access to all financial and investment related documents and data to analyze. The cash flow analysis is presented in below table.

Yearly Cash Flow (Based on type B Essential Oil Enterprise (Based on rudimentary market price analysis, and interviews with													
Vitals: 100 bigha land (10 Bigha own), 800 kg oil annual production, costing in 000, Average Price of Oils 6000 per kg													
Cost Head	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
HR	144	144	144	144	144	144	144	144	144	144	144	144	1728
Raw materials	100	100	100	100	100	100	100	100	100	100	100	100	1200
Wood/ Boiling	10	10	10	10	10	10	10	10	10	10	10	10	120
Depreciation	33	33	33	33	33	33	33	33	33	33	33	33	400
Maintenance	25	25	25	25	25	25	25	25	25	25	25	25	300
Loan	11	11	11	11	11	11	11	11	11	11	11	11	128
Farming Management	17	17	17	17	17	17	17	17	17	17	17	17	200
Miscellaneous	5	5	5	5	5	5	5	5	5	5	5	5	60
Cash Outflow	345	345	345	345	345	345	345	345	345	345	345	345	4136
Cash Inflow from Sales	200	100	300	200	400	500	600	1200	500	300	100	400	4800
Net Cash Flow	-145	-245	-45	-145	55	155	255	855	155	-45	-245	55	1024
	Profit Margin More than 21%												

Table 4: Cash Flow analysis of type B essential oil enterprise in Lumbini province

Are of Investment, Financial and Business Services

Essential oil-based enterprise provides income and employment to large number of smallholder farmers in Nepal. Around 70,000 smallholder farmers are estimated getting direct benefit from the MAP based enterprise in Nepal (ANSAB, 2016). Besides the direct beneficiaries, a large number of value chain actors get benefit from this business. Despite its large market potential, essential oil-based enterprise is still thriving with a number of issues and challenges, including business investment. Additionally, more than 85% essential oil is directly traded to India, despite its demand in Europe and the US market. Trade related barriers, including legal provisions, taxation, procedural time consumption are few challenges among others.

Based on interaction with major stakeholders, smallholder producers, and major traders in Lumbini province, the study concisely presented below key areas of investment, and issues that need to be addressed to promote essential oil business in the province in particular, and in Nepal in general.

Table 5: Areas of Investment and Interventions

Areas of investment	**Nature of enterprises**	**Amount required**	**Rationale for effective operation**
Capital investment for supply chain	Support already existed processing unit	NPR 100,000 for per Ropani (508.7 sq m) investment for MAPs	Public-private partnership with

strengthening	instead of new one	production	business support
Investment support for equipment/ additional capacity of processing unit	Equip additional capacity of existing processing units, either privately owned or community managed (privately owned is better option)	Equipment costs ranging from NRs 2 million to 10 million (this could be interest less or low interest capital support to private entrepreneurs	Discourage grant support, instead, promote low interest-based loan with fixed period ranging from 5 to 15 years return back provision
Investment support to storage/ cold house	There are already few small-scale storage facilities available, such as in Banke. Provide additional support with increased capacity	Capital investment ranges from 10 to 20 million based on capacity	Same modality discussed as above
Technical assistance/ advisory on product branding	There are number of essential oil brand available. In order to make them competitive in international market, external support is needed	Technical support and advisory, facilitation to improve international trade	In close coordination with private sector such as FNCCI, technical and advisory support to private entrepreneurs,
Laboratory facility for extraction and distillation units	In-house tests are needed to regularly test quality standards.	Up to NPR 2 million	Testing facilities are time consuming and scale of enterprises with large volume requires in house test units

6.1.4 NTFPs based enterprises

Five major non timber forest products, other than essential oil yielding species, are highly traded in the Lumbini province, 1) Lokta (*Daphne bholua) 2)* Argeli *(Thysanolaena maxima), 3)* Allo *(Girardinia diversifolia, and 4) Amriso,* Broom grass *(Thysanolaena maxima) and 5)* Babiyo *(Eulaliopsis binata).* Besides, these species, Bamboo (Bambusa species) and Nigalo (*Drepanostachyum* species) are other species traded for economic opportunities.

There is a growing demand of Nepalese handmade paper and is one of the major exporting commodities of Nepal. Handmade paper is manufactured from Lokta (*Daphne bholua, Daphne papyracea*) and Argeli (*Thysanolaena maxima*). Recently, Babiyo (*Eulaliopsis binata*) is also used to manufacture handmade paper. Nepal exported handmade paper and paper products worth NPR 1.817 billion in FY 2021/22, almost three times increment from the previous year's value[5]. Countries including the USA, UK, France, Germany, Japan and Australia are the major importers of the product.

The stem bark of Allo (Himalayan nettle; *Girardinia diversifolia*) contains fiber with unique strength, smoothness, and silk-like luster. The demand for Allo fabric is high in the international market. It is one of the most popular souvenir products of Nepal and its fiber has great cultural significance among various ethnic communities such as Magar, Gurung). The products are high in value, yet low in volume, however, is found within limited accessibility.

The market for broom; made from broom grass (*Thysanolaena maxima*) is expanding. There are several community-based enterprises such as in Bardiya, Dang, manufacturing and selling brooms. The demand of broom grass is expanding; however, a proper analysis of supply and demand is not well assessed.

Value chain and Value Chain Actors

Raw material supply and market chain

Lokta followed by Argeli are the two major raw materials for Nepalese handmade paper. In recent days, Babiyo is also being used to make handmade paper to lower the cost. The livelihood of an estimated 55,000 families depends on Lokta collection; about 300 registered SMEs produce handmade paper products both in remote mountain areas and in urban centers; and about 80% workforce in this sector are women (ITC, undated). Availability of Lokta is not properly assessed in recent days. However, previous assessment by FRSC indicated that 110,481 tons of Lokta is available on 2.91 million hectares of land and about 1,000 tons is collected annually, which produces 330 tons of paper (FRSC, 1984).

Allo (*Girardinia diversifolia*) is raw material for garments and clothes. With its unique fiber, allo garments do have high market demand both in Nepal and aboard. An estimate shows that

5 http://www.tepc.gov.np/news_events/full_story/nepali-post-27 (accessed May 22, 2024)

Nepal produces around 1,805 tonnes of Allo every year. Half of the production is consumed within Nepal and the other half is exported. According to the Handicraft Association of Nepal more than NPR 4.8 million worth of products made from Allo are exported annually to the international market (MEDEP 2011).

Amriso is another NTFP with high demand locally and nationally and can be cultivated in hilly area of Nepal everywhere. In Eastern Nepal, cultivation of allo has been organized whereas also in Lumbini province, it is getting popular in recent years. An estimate showed that production of Amriso is 10 tons / ha. In FY 2021/22, 14079 tons of Amriso worth NPR 699.8 million was exported (MoALD, 2023), showing a huge potential of Amriso in Nepal. The total production of Amriso, however, is not adequately studied.

While Lokta and Argeli are predominantly sourced from the wild, Agreli is off late being cultivated. NTFPs based industries situated in Lumbini province purchase raw materials from hills of Lumbini, Karnali and Sudurpaschim province, while Babiyo is mostly sourced from the Siwalik region of Lumbini province.

The market chain follows the conventional approach for Lokta, Argeli, Babiyo and Allo. Harvesters collect the bark from government forests, community managed forests or from the private forests; peel the outer bark, dry and store till they are sold. Harvesters mostly sold the bark to traders or directly to handmade/ allo thread manufacturers. Traders also sell to the manufacturers. Paper manufacturers make paper sheets and sell to paper product manufacturers who make different products, and sell to domestic market or abroad. Allo product manufacturers different items and sell to domestic market or abroad.

The broom market chain is yet to be organized like the other NTFPs products. In time of high demand, district traders purchase directly from harvesters and sell to major cities. There are few industries (e.g., in Dang, Bardiya) which purchase from farmers, make brooms and sell to domestic market and big cities.

Other actors

CFUGs and DFOs are the major non-farm actors in NTFPs value chain. Both provide collection permits whereas trade permit is only issued by DFO. However, collection permit is limited to the amount prescribed in forest management plan, and cannot be issued more than the amount prescribed in the management plan.

Key issues and constraint

- **Inadequate funds**: The producers for all these NTFP based products are the rural communities, having limited finances for commercial production of these products.
    - This is important to provide capital investment for these NTFP based products and producers to promote commercial production. Finance support as a grant may not yield positively, as a reason, minimum interest-based loan with sufficient pay-back period may help to strengthen these enterprises.

- **Shortage of human resources**: There is an increasing migration trend in rural areas, as a reason, human resource for these products (handmade paper and allo), are limited.
    - With shortage of labor/ human resources, there is a need of machine-based (technology) production system.
- **Product diversification:** In particular to Bamboo and Nigalo, communities and local entrepreneurs do have limited skills on product diversification.
    - Skill and training on product diversification would help to value addition and additional income to the smallholder enterprises.

Photo 5: Broom grass enterprise

Type of NTFP based Enterprises, and scale of Business in Lumbini province

Based on capital Investment, financial services, NTFP based enterprises can be divided into three major categories.

a) Type A: Micro Enterprises on Natural Fiber/ Artisans

b) Type B: Small enterprises with own finished product facility

c) Type C: Marketing agency for natural fiber products

Below table provides examples of existing NTFP-based enterprise in the Lumbini province with their categories and investment and margin of profit. These examples are based on limited interviews with enterprise owners in the province.

Table 6: Category of existing NTFP based enterprise in Lumbini visted

S.N.	Natural Fiber Subsector Based Enterprises	Types	Nature	Investment (NPR)	Profit margin
1	Dang Hastakala Sang, Lumbini, Dang	Type A	Micro Enterprises on Natural Fiber	Upto 0.5 million	30%
2	Om Swargadwari Nepali Kagaz and Paper Udhyog, Lubmini Dang	Type B	Small enterprises with own finished product facility	3-4 million	20%
3	Unique Didi Bahini Allo Udhyog, Lumbini, Dang	Type B	Small enterprises with own finished products facility	2- 3 million	30%
4	Sanju Aarati Kucho Udyog, Lumbini, Dang	Type B	Small Enterprise with own Finished product facility	3-4 million	19%
5	Marketing Agency (Recommended)	Type C	Marketing Agency for natural fiber products	10 million	N.A.

Natural fiber harvesting Calendar

Harvesting of the natural fibers usually follows a certain calendar as per the season. In addition, financial flow for different categories of natural fiber enterprises (type A, B, and C) depends on the season of harvesting (see table below). The generic crop calendar for natural fibers is provided in the table below:

Table 7: Crop calendar for natural fiber yielding plants

Months	Harvesting Calendar of Natural Fiber											
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Lokta												
Argeli												
Babiyo												
Amriso												
Allo												
Finances needed (high need)												
Type A												
Type B												
Type C												

As shown in the table, high cash requirement is observed in July, November and May for small scale entrepreneurs (Type A). While financial flow is crucial during the initial five months for type B, flow of cash is crucial during the mid part of the year for type C entrepreneurs.

Cash Flow Analysis (based on type B enterprise)

The study team analyzed cash flow for NTFP based enterprise with a focus on type B (Amriso based) enterprise. This analysis is based on response from the entrepreneur and limited account and cash flow documents review, and therefore, taken as an indicative for medium sized Amriso enterprise promotion in the province. Average profit margin is around 19%, however, could be more as the study team do not have access to all financial and investment related documents and data to analyze. The cash flow analysis is presented in below table.

Table 8: Cash flow of natural fiber enterprise (based on category B)

Yearly Cash Flow of Type 2 Natural Fiber Enterprise: Broom													
based on: 70000 kg broom grass annually, Broom : 300000 pcs, Amount in 000													
Cost Head	***Jul***	***Aug***	***Sep***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Total***
Raw materials Broom grass							4550	4550					9100
HR	125	125	125	125	125	125	125	125	125	125	125	125	1500
Supporting materials	125	125	125	125	125	125	125	125	125	125	125	125	1500
Depreciation of Machine	10	10	10	10	10	10	10	10	10	10	10	10	120
Maintenance of Machine	5	5	5	5	5	5	5	5	5	5	5	5	60
Transport and Logistic	5	10	5	10	15	5	400	400	5	5	10	5	875
Management (Interest, Rent and others)	6	6	6	6	6	6	6	6	6	6	6	6	72
Miscellenous	5	5	5	5	5	5	5	5	5	5	5	5	60
Cash Outflow	281	286	281	286	291	281	5226	5226	281	281	286	281	13287
Cash Inflow from Sales	500	1000	500	4600	5000	500	200	200	1000	500	2000	500	16500
Net Cash Flow	219	714	219	4314	4709	219	-5026	-5026	719	219	1714	219	3213
	Profit Margin More than 19%												

Financial, Business Services and Area of Investment

NTFP based enterprises are diverse with market fluctuation

n and labor intensive. Depending on the type of enterprise, the demand for financial, business and other services area varies, therefore, need a proper business plan before starting the business with possible market. Table below provides the financial and other business support as well as area of investment to promote NTFP based enterprise in the province.

Table 9: Financial and Business Services requirements

Enterprises	**Financial Service**	**Other Business Services**

	Requirement	
Type A: Artisan/ Micro Enterprise/ Cultural producers	I. Mainly required finance for festive season II. Local Government providing capacity building and seed funding for Micro Enterprises	● Market led design and product development ● Plantation of Natural Fiber, identification of underutilized fiber and its commercial importance
Type B: Enterprise with processing and finished products	I. Cash requirement on purchase of raw materials II. Technology for volume production and reducing HR cost	● Product development ● Design and Branding
Type C: Marketing	I. Cash Requirement on purchase of finished products from Type A and Type B enterprises	● Global market outreach and facilitation ● Certification on eco-friendly products

Areas of investment

Table 10: Area of Investment

Areas of investment	**Nature of enterprises**	**Amount required (NRs)**	**Rationale for effective operation**
Marketing promotion	Type B enterprises (as marketing agency)	1 million	Increase niche market for eco-friendly product nationally and globally
Plantation of natural fiber and sustainable	Type B enterprise (investment on plantation and	2 million	Raw materials are major cost head, Enterprises business

harvesting	sustainable harvesting through Public-Private Partnership)		should consider developing source in and promoting eco-friendly market system
Technology upgrade	Type C enterprises	Above 2 million	Optimum technology on natural fiber processing required to reduce high human effort

6.1.5 Kattha

In recent years, Kattha enterprise in Nepal and also in Lumbini province is facing problem of critical raw material supply. Natural Khair (*Acacia catechu*) forest is diminishing, as a result, supply of raw material for *Kattha* become limited. Kattha enterprise needs a higher capital investment and working capital. The Industrial Enterprise Act 2020 categorizes *Kattha* industries as medium or large sized enterprises. The study team interviewed one Kattha entrepreneur from Lumbini province, exploring issues and challenges, capital investment and profit margin therein. Below analysis is based on interviews with the entrepreneur with limited data available, therefore, may have chances of high error on data and interpretation herein.

There are very few Kattha factories in Nepal, and only one in Lumbini province. With limited supply of raw materials, there factories run with an average of six months (half of its production capacity). Initial capital investment for machinery is about NRs 50 million, and land property investment is even higher than the machinery investment. The kattha industry purchases Khayar logs from the division forest offices (DFOs) through an auction process, during December – January. Working capital to purchase Khayar log costs around NRs 200 million for a season.

In summary, Kattha enterprise is high capital investment enterprise with niche market. However, limited availability of raw materials limits its production capacity. There is a need to promote Khair plantation to sustain Kattha enterprise in the province, and also in pal.

The existing Kattha factory in Rupandehi district of Lumbini province needs around 20,000 cft Khair logs annually. One Cft log is around 30 kg and 2.5 kg Kattha can be extracted from one log of Khair with 1.5 cutch (by product). Average price of Kattha is NRs 6-7 thousand per kg whereas cutch is sold at Nrs 60-70 per kg. Almost 90% Kattha is exported to India with limited market demand in Nepal.

One Kattha factory can provide direct employment to 70 persons, whereas many other can benefit from Kattha value chain enterprise. With increasing Kattha demand in India, this can be a profitable business and can generate a number of employments.

6.1.6 Rosin and Turpentine

Chir pine (*Pinus roxburghii*) based Rosin and turpentine is one of the biggest sub sectors among the forest-based enterprises in Nepal in terms of capital investment. Lumbini province produce around 3 million kilograms of resin from chir pine forests annually, contributing significant income and employment generation (Provincial Forest director, 2078/79). A total of 9755 tons of rosin and turpentine oil with value of NPR 1.85 billion is exported from Nepal in FY 2021/22 (myRepublica, 2023). The major export destinations of rosin and resin acid include India, USA, Turkey, Germany, UK China, Italy, France, Bangladesh, Pakistan, Japan, Canada, UAE, Australia. The number of rosin and turpentine industries, however, has decreased significantly in the past few years: from 18 to six industries by 2021 (Chhetri and Timilsina 2021).

The study team consulted Mount Rosin and Turpentine Industries Private Limited, Rupandehi in Lumbini province. They purchase crude pine resin from community forests from 24 districts, including districts of Lumbini province. The large amount of crude pine resin is

taken from Sudur Paschim province, though. The industry directly and indirectly employs about 3000 workers: more than 300 workers in the factory, 400 supervisors in the field and more than 2000 laborers in the field. They purchase 5100 tons of crude pine resin, and manufacture 400 tons of rosin and 765000 liters of turpentine. Rosin is sold at NPR 150 – 160 per kg, and turpentine is sold at NPR 130 – 140 per kg.

Table: Resin production from Lumbini province in FY 2078/79

Division	Dang	Rolpa	Pyuthan	Arghakhachi	Palpa	Total
Production (kg)	81,663	1835825	1034517	166832	71055	3,189,892

Source: Annual Progress Report-FY 2078/79, Provincial Forest Directorate, Lumbini province

Sustainable extraction of crude resin from Pine tree is one of the major issues, despite a clear guideline on resin extraction. There is a large-scale value chain of Pine resin, as resin extraction is mostly done by local communities generating income for them. This also provide employment to transport sector, taking resin from remote part to the factory.

7. Overview and Status of MAP/NTFP in the Lumbini Province

Lumbini province covers 2,228,800 ha of land which is 12.1% of Nepal's total geographical area. Forest covers around 43.71% (974,381 ha) of the total area of Lumbini province (DFRS, 2015). Out of 12 districts, six are mostly in low land Terai, and its area also stretches up to Himalayan range. With diverse ecological conditions, it harbors a diverse range of floral species, including medicinal and aromatic plants. The present forest management modalities and governance regime is presented in table below.

Table: Forest categories based on management regimes

Forest mgmt. type	*Protected Forest*	*Collab forest (CFM)*	*Block forest*	*Community forests*	*Leasehold forest*	*Religious forest*	*PAs*
Area	98,219.55	22,958.53	3,124	423,618	2,349.3	969.92	285,955

(ha)							

Source: Annual progress Report, Lumbini Forest Directorate, FY 2078/79

Owing to diverse geography and bioclimates, the country has over 13,000 species of plants (Chaudhary et al., 2020), including about 7,000 species of flowering plants (Shrestha et al., 2018) and 2,500 medicinal and aromatic plants (Kunwar et al., 2021,). Medicinal plant species richness in Nepal peaks at the elevational range 1,000–2,500 m above sea level (asl) (Bhattarai and Ghimire, 2006). There is limited research and assessment available on NTFP/MAP in Lumbini province, however, as estimate confirms that the Lumbini province possesses more than 1600 species of MAPs (Shrestha et. al., 2019).

Out of available NTFP/MAPs, there are thirty species mostly in trade, and out of these 30 species, ten species are highly traded. Kunwar et. al., mentioned that MAPs are under threat from both climatic and other stresses, and therefore, availability of these species are on decreasing trend. In situ conservation of high mountain and high value MAPs is of urgent need through sustainable harvesting, and proper management options. Table below provides the production and sale of NTFP/MAPs from Lumbini province in FY 1978/79.

Table: Production and Sale scenario of NTFPs in the Lumbini province (other than Resin) FY 2078/79 (*Total sale includes stock from previous year)

District /Division	***Production (Kg)***	***Sale (Kg)***
Bardiya	4483	8088
Banke	0	0
Dang	381,402	438,952
Kapilbastu	0	0
Gautam Budhha	0	42,000
Rupandehi	0	0
Rolpa	152,220	169,961
Pyuthan	119,964	119,964
Arghakhachi	48,106	48,106
Gulmi	6,088	6,088
Palpa	1,156,590	1,156,590
Deukhuri	24,500	24,500
Nawalparasi	0	0
Rukum-East	91,491	79,466
Total	**1984843.55**	**2093714.55**

Source: Annual Progress Report-FY 2078/79, Provincial Forest Directorate, Lumbini province

Apart from medicinal and aromatic plants, five major NTFP species are highly traded in Lumbini province. These species include, 1) broom grass 2) Bamboo and Nigalo, 3) Resin fro

Chir pine, 4) Allo and 5) Lokta and Argeli. Table below provides synopsis on production of Resin from the Chir pine.

Table: Production Resin in the Lumbini province (FY 2078/79)

Division	Dang	Rolpa	Pyuthan	Arghakhachi	Palpa	Total
Production (kg)	81,663	1835825	1034517	166832	71055	3,189,892

Source: Annual Progress Report-FY 2078/79, Provincial Forest Directorate, Lumbini province

District wise production of major traded MAP/NTFP species in Lumbini province is provided in subsequent table below (Source for all district-based data taken from respective DFO records)

1) Rukum East

SN	Name of NTFP/MAP	Scientific name	Collection and exit from the district (Kg)		
			76/77	78/79	79/80
1	Allo	*Girardina diversifolia*	8440	6000	2900
2	Amala	*Phyllanthus emblica*	400	800	_
3	Atis	*Aconitum heterophyllum*	0	440	_
4	Bhir maha	*Wild honey*	1700	2700	_
5	Bishma	*Aconitum spicatum*	5	_	_
6	Bojho	*Acorus calamus*	500	750	_
7	Chiraito	*Swertia chirayita*	50	283	_
8	Dalchini	*Cinnamomum tamala*	600	600	_
9	Kakarsingi	*Pistacia chinensis*	250	100	_
10	Kala dana /sarkali	*Ipomea nill*	1200	1300	_
11	Kalikath ko dana	*Aporasa octandra*	_	_	2100
12	Kalo musli	*Curculigo orchioides*	1500	1500	_
13	Karaj chulthe	*Rheum australe*	1650	0	_
14	Kaulo	*Machilus vilosa*	200	400	_
15	Kurilo	*Asparagus racemosus*	100	_	_
16	kutki	*Picorrhiza kurroa*	1250	5950	_
17	Lokta	*Daphne bholua*	_	700	_
18	Ordinary chyau	*Mushroom spp.*	0	_	_
19	Padamchal	*Rheum australe*	20800	4850	2600
20	Pashanved	*Bergenia ciliate*	20250	13000	1600
21	Rato chyau	*Ganoderma spp.*	_	2280	4657
22	Ritha	*Sapindus mukorossi*	500	300	_
23	Satuwa	*Paris polyphylla*	30	_	_
24	Setakchini	*Polygonatum spp.*	12950	19200	_

25	Seto musli	*Chlorophytum borivilianum*	1700	1500	_
26	Sisnu jara	*Urtica spp.*	1300	3850	_
27	Sugandhawal	*Valeriana jatamansi*	500	1200	_
28	Tejpat	*Cinnamomum tamala*	600	600	_
29	Tigedi	*Sarcosperma arboretum*	1890	500	_
30	Timur	*Zanthoxylum armatum*	60	60	_
31	Yarshagumba	*Ophiordyceps sinensis*	_	6	_

2 Rolpa

SN	**Name of NTFP/MAPs**	**Scientific name**	**Estimate production/ Year**	**Collection**	**Parts used**
				FY 79/80	
1	Leaves of tejpat	*Cinnamomum tamala*	_	6,100	leaves,stem
2	Bark of tejpat	*Cinnamomum tamala*	5,000	20,900	Bark
3	Timur	*Zanthoxylum armatum*	48,000	71,955	Fruit,seed
4	Ritha fruit	*Sapindus mukorossi*	40,000	23,800	Fruit,seed
5	Lokta	*Daphne bholua*	48,000	1,000	Bark
6	Pashanbed	*Bergerina ciliata*	_	8,000	Root and bulb
7	Sugandhakokila/ Malagiri	*Cinnamom glaucescens / glanduliferum*	5000	2,400	Fruit,seed
8	Majitho	*Rubia cordifolia*	4,000	1,200	leaves,stem
9	Kalikath ko dana	*Aporosa octandra*	20,000	36,450	Fruit,seed
10	Sugandhawal	*Valeriana jatamansi*	2500	1,410	Root and bulb
11	Chiraito	*Swertia chirayita*	3000	2,200	Seedling
12	Pani amala	*Nephrolepis cordifolia*	12,000	100	Fruit,seed
13	Amala	*Phyllanthus emblica*	15,000	30,000	Fruit,seed
14	kaulo bokra	*Persea spp.*	NA	4000	Bark
15	Setakchini	*Pollygonatum spp.*	NA	200	Root and bulb
16	Gurjo	*Tinospora cordifolia*	5000	200	Root and bulb
17	Rato chyau	*Ganoderma lucidum*	4000	4650	Whole parts
18	Padamchal(amalbed)	*Rheum australe*	30,000	18500	leaves,stem
19	Phal khoto	*Pinus roxburghii*	5000	200	Gum,Resin
20	Titepati	*Artemisia spp.*	10,000	18900	leaves,stem
21	Kakarsingi	Insect gall on *Pistacia integerrima*	2000	330	Gum,Resin

3. Palpa (*note: There are more than 50 species found in Palpa as indicated in below table, however, only few goes through legal DFO process for exit permit. The reason, production of other species than DFO record is not available)*

SN	Name of NTFP/MAPs	Scientific name	Collection or exit from the district (kg)			
			76/77	77/78	78/79	79/80
1	Aank	Calotropis gigantea				
2	Ainselu	Rubus ellipticus				
3	Allo	Girardinia divesifolia				
4	Amala	Phyllanthus emblica				
5	Amliso	Thysanlaena spp.	_	_	_	_
6	Amliso	Thysanolaena maxima				
7	Asuro	Adhatoda vasica				
8	Baans	Bambusa spp:Dendrocalamus spp				
9	Bark of tejpat	Cinnamomum tamala	230,858	191,415	197,214	207,030
10	Barro	Terminalia belerica				
11	Bel	Aegle marmelos				
12	Bhorla	Bauhinia vahlii				
13	Bijay sal	Pterocarpus marsupium				
14	Bilaune	Maesa chisia				
15	Bojho	Acorus calamus				
16	Chhatiwan	Alstonia scholeris				
17	Chiraito	Swertia chirayita				
18	Chiuri fruit	Diploknema butyraceae	_	_	_	_
19	Chutro	Berberis aristata	_	_	_	_
20	Tejpat	Cinnamomum tamala	777844	918,810	966,376	992,020
21	Dhayero	Woodfordia fruticosa				
22	Ghiukumari	Aloe vera				
23	Ghodtapre	Centella asiatica				
24	Gurjo	Tinospora cordifolia				
25	Harro	Terminalia chebula				
26	Indrajau	Holarrhena antidysentrica				
27	Kalo musali	Curculigo orchioides				
28	Kaulo	Machilus odoratassima	0	0	1800	0
29	Ketuki	Agave americana				
30	Khayer	Acacia catechu				

31	*Lajjawati jhaar*	*Mimosa pudica*				
32	*Lapsi*	*Choerospondias axilaris*				
33	*Majitho*	*Rubia cordifolia*				
34	*Nagbeli*	*Lycopodium clavatum*				
35	*Nigalo*	*Arundinaria spp*				
36	*Niuro*	*Matteuccia struthiopteris*	_	_	_	_
37	*Pani amala*	*Nephrolepis cordifolia*				
38	*Pashanbed*	*Bergenia ciliata*	_	_	_	_
39	*Pipala*	*Piper longum*				
40	*Rajbriksha*	*Cassia fistula*				
41	*Ritha*	*Sapindus mukorossi*				
42	*Sajiwan*	*Jatropha curcas*				
43	*Sarpagandha*	*Rauvolfia serpentina*				
44	*Simali*	*Vitex negundo*				
45	*Srikhanda*	*Santalum album*				
46	*Sugandhakokila*	*Cinnamomum glaucescens*				
47	*Sugandhawal*	*Valeriana jatamansi*				
48	*Sungava*	*Cymbidium spp, Bulbophyllum spp*				
49	*Timur*	*Zanthoxylum armatum*	_	_	_	_
50	*Titepati*	*Artemisia vaulgaris*				

4. Pyuthan

SN	Name of NTFP/MAPs	Scientific name	Estimated production/ year	Collection or exit from the district			
				76/77	77/78	78/79	79/80
1	Leaves of tejpat	*Cinnamomum tamala*	30,936	15,480	33,918	41,007	33,338
2	Bark of tejpat	*Cinnamomum tamala*	23,127	11,760	15,960	32,563	32,227
3	Timur	*Zanthoxylum armatum*		9,840	21,604	11,299	3,265
4	Allo dhago	*Girardiana diversifolia*	7,614	907	5,800	11,000	12,750
5	Allo	*Girardiana*	4,247	0	3,749	8,490	4,750

	dhago(kachcha)	*diversifolia*					
6	Ritha fruit	*Sapindus mukorossi*	15,591	11,365	7,430	15,820	27,750
7	Lokta	*Daphne bholua*	5,375	3,500	0	2,000	16,000
8	Pashanbed	*Bergerina ciliata*	4,534	13,990	2,195	1,952	0
9	Chiuri fruit	*Diploknema butyraceae*	1,260	4720	0	320	0
10	Sugandhakokila	*Cinnamom glaucescens*	49	0	198	0	0
11	Majitho	*Rubia cordifolia*	22	0	88	0	0
12	Kalikath ko dana	*Aporosa octandra*	12,739	0	250	5,889	6,600
13	Sugandhawal	*Valeriana jatamansi*	25	0	0	100	0
14	Bojho	*Acorus calamus*	51	0	0	205	0
15	Chiraito	*Swertia chirayita*	14	0	0	57	0
16	Pani amala	*Nephrolepis cordifolia*	375	0	0	0	1500
17	Amala	*Phyllanthus emblica*	1280	0	0	0	5,120
18	Khoto	*Pinus roxburghii*	748069.5	637822	262620	1034517	1,057,319

5.Arghakhachi

8.

SN	Name of NTFP/MAPs	Scientific name	Estimated production/ year	Collection or exit from the district			
				76/77	77/78	78/79	79/80
1	Leaves of Tejpat	Cinnamomum tamala	29,420	17,668	49,752	22,685	27,575
2	Bark of Tejpat	Cinnamomum tamala	28,692	18,635	30,490	23,621	42,024
3	Sugandhawal	Valeriana jatamansi	26	105	0	0	0
4	Kaulo bokra	Machilus odoratissima	450	0	0	1,800	0

6. Dang

S	**Name of**	**Scientific**	**Estimate**	**Collection or exit from the district**

N	NTFP/MAPs	name	d Production /year	76/77	77/78	78/79		79/80
						Collection	Exit	
1	Amala	*Phyllanthus emblica*	3,625	1500	9000	10000	3000	1,000
2	Amalbed	*Rheum australe*	0	0	0	650	650	
3	Arjun	*Terminalia arjuna*	0	0	0		0	0
4	Asuro	*Justicia adhatoda*	0	0	0		0	0
5	Bark of tejpat	*Cinnamomum tamala*	10,636	500	0	33,400	33,400	8,645
6	Barro	*Terminalia bellerica*	1,563	1,250	5,000	3,500	0	0
7	Bel	*Aegle marmelos*	0	0	0	2000	0	0
8	Belchana		1,250	2,000	3000	0	0	0
9	Bhringraj	*Eclipta prostrata*	775	1,600	1,500	1,000	0	0
10	Bramhi	*Bacopa monnieri*	625	0	1500	2500	1000	0
11	Chiraito	*Swertia chirayita*	0	0	0	250	250	0
12	Chutro bokra	*Berberis aristata*	5,200	12,800	5,000	3,000	3000	0
13	Dhanyero ful	*Woodfordia fruticosa*	375	0	1,500	0	0	0
14	Dudhe lahara	*Ichnocarpus frutescens*	875	2,000	1500	0	0	0
15	Fal khoto	*Pinus roxburghii*	0	0	0	2000		0
16	Ghodtapre	*Centella asiatica*	0	0	0	0	0	0
17	Harro	*Terminalia chebula*	1,250	1,000	4000	3500	0	0
18	Kalikath	*Aporasa octandra*	20,270	0	0	1,000	1,000	80080
19	Kaulo bokra	*Machilus odoratissima*	18,249	0	0	29000	29000	43995
20	lahare gurjo	*Tinospora cordifolia*	5,475	3,000	9000	5000	2500	7400
21	Leaves of tejpat	*Cinnamomum tamala*	27,550	7,500	12500	27,600	25,100	65,100
22	Lemongrass	*Cymbopogon citratus*	0	0	0		0	0

23	Malagiri	*Cinnamomum glandulifer um*	22,650	6,400	15500	69700	55,200	13,500
24	Pakhanbed	Bergenia ciliate	0	0	0	1600	1600	0
25	Pudina	*Mentha arvensis*	625	1,000	1,500	1,000	0	0
26	Punarawa	*Boerhavia diffusa*	0	0	0	0	0	0
27	Rajbriksha	*Cassia fistula*	0	0	0		0	0
28	Ritha	*Sapindus mukorossi*	21,603	4000	11,000	48,010	43,010	28,400
29	Sal seed	*Shorea robusta*	0	0	0		0	5000
30	Sugandhakokila	*Cinnamomum glaucescens*	0	0	0		0	0
31	Tatelo bokra	*Oroxylum indicum*	2,500	10000	0	1,000	0	0
32	Tendu leaves	*Diospyros melanoxylon*	1,000	0	0	0	0	4000
33	Tigedi	*Sarcosperma arboretum*	1,500	0	0	1000	1000	5000
34	Timur	*Zanthoxylum armatum*	94,787	24000	40500	244,192	241,742	72,906

7. Bardiya

SN		**Scientific name**	**FY 77/78 (kg)**	**Collection or exit from the district (79/80)**
1	Shikakai	*Acacia concinna*	8715	1500
2	Gurjo Lahara	*Tinospora cordifolia*	0	1200
3	Bet baansh	*Dendrocalamus spp.*	7502	0

8. Nawalparasi -west

SN	Name of NTFP/MAP	Scientific name	Production /exit
			FY 79/80
1	Betbas	*Calamus rotang*	4184
2	Jhyau*	*Parmelia nepalensis*	9580

*This species is not production of the district, instead seized by DFO authorities when found illegal trade

9. Banke

S.N.	Name of NTFP/MAP	Scientific name	estimated Production/ year	Collection or exit from the district
				79/80
1	Amala	*Phyllanthus emblica*	1125	1125
2	Amalbed/Padamchal	*Rheum australe*	1228	1228
3	Atis	*Aconitum heterophyllum*	50	50
4	Ban lasun	*Allium wallichii*	50	50
5	Bet baansh	*Dendrocalamus spp.*	4995	4995
6	Bisjara	*Aconitum spicatum*	1850	1850
7	Curry Leaves	*Murraya koenigii*	805	805
8	Dalchini	*Cinnamomum tamala*	5049	5049
9	Fal Khoto	*Pinus roxburghii*	232	500
10	Halhale	*Taraxacum officinale*	1580	1580
11	Kakarsingi	*Insect gall on Pistacia integerrima*	27	27
12	Kalikathko dana	*Aporasa octandra*	7443	7443
13	Kalo musli	*Curculigo orchioides*	640	640
14	Kaulo bokra	*Machilus odoratissima*	1450	1450
15	Kutki	*Picrorhiza Kurroa*	3230	3230
16	Majitho	*Rubia cordifolia*	360	360
17	Pakhanbed	*Bergenia ciliata*	3376	3376
18	Pipala	*Piper longum*	381	721
19	Ritha	*Sapindus mukorossi*	1503	1958
20	Saldhup	*Shorea robusta*	500	500
21	Salla ko aankhlo	*Pinus roxburghii*	20000	25690
22	Setakchini	*Polygonatum verticillatum*	125	125
23	Sisno jara	*Urtica Spp.*	1450	1450
24	Sugandhawal	*Valeriana jatamansi*	2920	2920
25	Timur	*Zanthoxylum armatum*	12570	12570

10. Rupandehi (Note: this data is export to India via Bhairhawa , not all species are found in Rupandehi district)

SN	Name of NTFP/MAP	Scientific name	Production or exit
			FY 79/80
1	Ashwagandha	*Withania somnifera*	500
2	Bhusi isabol	*Phyllium husk*	840
3	Bidharikand	*Pueraria tuberosa*	298.4
4	Gambhari	*Gmelina arborea*	532.6
5	Gulab patti	*Rose centifolia*	778
6	Hing	*Asafoetida*	320
7	Indrajau	*Holarrhena antidysenterica*	292
8	Jamun giri	*Syzigium cumini*	635.9
9	Kali jeeri	*Centratherum anthelminticum*	433.5
10	Mulethi	*Glycyrrhiza spp.*	500
11	Musli	*Chlorophytum borivilianum*	720
12	Neem patti	*Azadirachta indica*	1130.6
13	Nishod	*Operculina turpethum*	907
14	Pushkarmool	*Ephedra gerardiana*	482.6
15	Sataver	*Asparagus spp.*	358
16	Silajit	*Asphaltum*	150

11. Gulmi

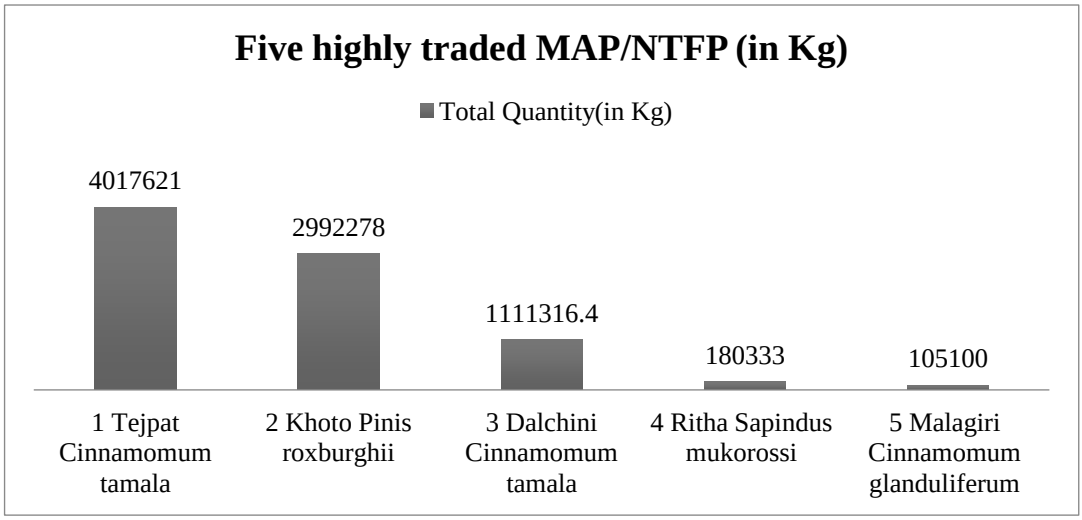
S.N.	Name of NTFP/MAP	Scientific name	Collection or exit from the district			
			76/77	77/78	78/79	79/80
1	Srikhanda	*Santalum album*	120.81	0	0	0
2	Bark of Kaulo	*Machilus odoratissimus Nees*	0	1750	0	0
3	Bark of Tejpat	*Cinnamomum tamala*	0	2535	5290	0
4	Leaves of Tejpat	*Cinnamomum tamala*	0	350	798	0

5.1 *Nepalgunj: A hub for Medicinal and Aromatic Plants*

Nepalgunj is found a major hub for medicinal and aromatic plants processing and trade. It is estimated that almost 80% MAP trade of Nepal have been through Nepalgunj trade center, including export to India. There are a number of MAP entrepreneurs doing business with a base in Nepalgunj, and associated with association like JABAN. Discussion with members of

JABAN reveals that they do have already good infrastructure and trade knowledge, as a reason, government needs to focus in Nepalgunj for any type of capital and other investment related to medicinal and aromatic plants. There are more than 9 processing units already operational in Nepalgunj area, mostly owned by private business owners, and few small-scale processing units are under community ownerships. Smallholders' farmers, and small-scale processing unit owners also sale their product to Nepalgunj based traders.

Data from DFO Banke and JABAN indicated that majority of MAPs/NTFP from Lumbini, Sudur Paschim, Karnali provinces are traded either in raw or processed in Nepalgunj. Some MAP species from other provinces also traded through this route. Tejpat leaves, Tejpat bark (Dalchini), Rithha, Pine resin, and Malagiri are top five traded MAP/NTFP through Nepalgunj hub. Below diagram provides details on these highly traded species with their quantity in FY 2079/80



Data from DFOs, and private enterprises such as JABAN indicates that a total of 575,585 kilogram of 35 MAP species are traded from Lumbini province in Nepalgunj hub. In addition, Nepalgunj hub gets more than 60 species from different provinces. Below table provides details on MAP trade from Lumbini province to Nepalgunj hub. Details on MAP/NTFP trade in Nepalgunj is provided in Annex (with different Excel file)

Table: Major MAP/NTFP traded from Lumbini province through Nepalgunj hub (FY 2079/80)

SN	Name of NTFP/MAP	Scientific name	FY 2079/80 (Kg)
1	Timur	*Zanthoxylum armatum*	131646
2	Tejpat	*Cinnamomum tamala*	26809
3	Dalchini	*Cinnamomum tamala*	32908

4	Kutki	*Picrorhiza Kurroa*	8000
5	Pakhanbed	*Bergenia ciliata*	13426
6	Amalbed/Padamchal	*Rheum australe*	25371
7	Ritha	*Sapindus mukorossi*	68140
8	Setakchini	*Polygonatum verticillatum*	18125
9	Majitho	*Rubia cordifolia*	960
10	Shikakai	*Acacia concinna*	1500
11	Bojho	*Acorus calamus*	24195
12	Sugandhakokila	*Cinnamomum glaucescens*	39000
13	Kalikathko dana	*Aporasa octandra*	111357
14	Chiraito	*Swertia chirayita*	200
15	Gurjo Lahara	*Tinospora cordifolia*	1200
16	Kaulo bokra	*Machilus odoratissima*	21950
17	Sisno jara	*Urtica Spp.*	2225
18	Kalo musli	*Curculigo orchioides*	2375
19	Bisphej	*Polypodium vulgare*	2600
20	Halhale	*Taraxacum officinale*	1580
21	Chutro	*Berberis aristata*	250
22	Atis	*Aconitum heterophyllum*	50
23	Bet baansh	*Dendrocalamus spp.*	4995
24	Pipala	*Piper longum*	721
25	Bisjara	*Aconitum spicatum*	1850
26	Amala	*Phyllanthus emblica*	3125
27	Saldhup	*Shorea robusta*	500
28	Sugandhawal	*Valeriana jatamansi*	2920
29	Kakarsingi	*Insect gall on Pistacia integerrima*	27
30	Salla ko aankhlo	*Pinus roxburghii*	25690
31	Fal Khoto	*Pinus roxburghii*	500
32	Kala dana	*Ipomea hederecea*	520
33	Curry Leaves	*Murraya koenigii*	805
34	Ban lasun	*Allium wallichii*	50
35	Silajit	*Asphaltum*	15
		Total	**575585**

Source: DFO database, JABAN Database , 2024

8.2 5.2 Financial Need, Enterprise Cost and Possible Government Support

There are five major types NTFP/MAP based enterprise in Lumbini province, a) essential oil, b) fiber-based c) Rosin and Turpentine d) Kattha and 5) broom grass-based enterprise. Except for broom grass, which is mostly a home based and labor intensive without any machinery requirement, major costs are a) labor b) raw materials c) machinery and d) management costs. Except for fiber based enterprise, all other types, as indicated below in figure, need around 30 to 35% costs on technology. The fiber-based enterprise is mostly raw materials cost with minimum technology costs.

Capital investment for machineries, tax subsidies in MAP based products and raw materials, and technical support to diversify products and export are major possible government support to enhance the capacity of MAP/NTFP based enterprises for generating additional income and employment. Government can have multiple options to support these enterprises, such as concessional loans (max 5% interest) with long pay back period, incentive on product or outcome, tax subsidies on export and raw materials.

For the purpose of possible government support in Lumbini province, the study team assessed a number of possible enterprise modalities and possible support. Table below provides synopsis on area of investment and possible government support in Lumbini province.

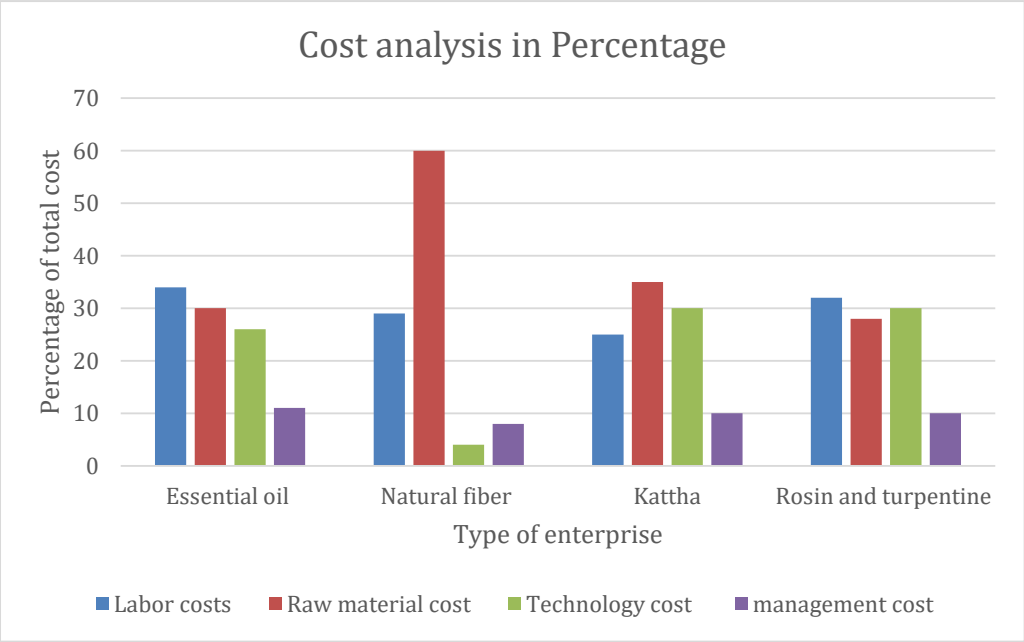


Figure 4: Cost head analysis of different category of MAP/NTFP based enterprise

8.3 5.3 Financial need assessment and areas of investment

Financial needs and area of investment for all type of NTFP/MAP based enterprise is assessed based on key informant interviews (government officials, enterprise owners and

business houses). Primary qualitative information is further validated through available secondary data and information, including published scientific articles, assessment reports. Financial need assessment and area of investment discussed below is an indicative for possible government support to strengthen production and marketing capacity of enterprises in the province.

Table 12: Financial Need Assessment of NTFP/MAP based enterprises

Enterprises	**Financial Service Requirement**	**Business Service Requirement**	**Areas of Investment**	**Amount Required (NPR)**
		Essential Oils		
Type A: MAPs plantation and seasonal distillation	Distillation units being obtained from grants/subsidies. Regular financial flow is needed to pay labor. Currently, enterprises are managing such payments	Promotion of Good Agricultural Practices towards organic farming Analysis of opportunity cost for plantation of MAPs with a crop calendar	Investment is needed in supply chain of existing enterprises	NPR 100,000 for per Ropani (508.7 sq m) investment for MAPs production
Type B: Plantation, Collection and Distillation	Cash requirement on purchase of raw materials and labor Investing on farmers for MAPs production in public- private partnership	Marketing of the products Quality standards and Certification	Laboratory facility for extraction and distillation units	Up to 2 million
		NTFPs based		
Type A: Artisan/ Micro Enterprise/ Cultural producers	Mainly required finance for festive season Local Government providing capacity building and seed funding for Micro Enterprises	Market led design and product development Plantation of Natural Fiber, identification of underutilized fiber and its commercial importance	Seed Capital as loan to artisans to formalize	0.5 million
Type B: Enterprise with processing and finished products	Cash requirement on purchase of raw materials Technology for volume production and reducing HR cost	Product development Design and Branding	Type B enterprises (investment on plantation and sustainable harvesting through Public- Private Partnership) Technology upgrade	Above 2 million

Enterprises	Financial Service Requirement	Business Service Requirement	Areas of Investment	Amount Required (NPR)
Type C: Marketing Agency	Cash Requirement on purchase of finished products from Type 1 and Type 2 enterprises	Global market outreach Certification on eco-friendly products	Marketing positioning	Above 10 million
Kattha				
Type D	Huge amount of cash required during purchase of Khayar	The demand of Kattha and biproduct (Cutch) is very high in India. No additional service required	Saturated	From 300 – 350 million in a collection season
Rosin and Turpentine				
Type D	Cash requirement during purchase of crude pine Rosin	Product diversification (pine oil, pinene, DDT)	Introduction of technology for finished products after rosin and turpentine.	Up to 300 million

8.4 5.4 Key Issues and Bottlenecks in NTFP/MAP Enterprise promotion

Despite the increasing global demand for MAP based products, and already a large investment in this sector, Nepali NTFP/MAP based enterprises are facing a number of issues and bottlenecks which not only limits the production, but also hinders international trade. These challenges are ranging from legal procedures, to large scale capital investment through Bank loans with heavy interest rate.

The study team consulted with a number of entrepreneurs, ranging from small scale handicraft to large capital based Kattha factory. Based on these discussions, and also literature review of policy document, and scientific article, key issues and bottlenecks are presented below. In order to address these issues and bottlenecks, governments at all level need an honest attempt to simplify procedures, and also offer concessional loans to enterprises.

a) New Enterprise Registration

There are number of legislative instrument guiding to register new enterprise. The Industrial Enterprise Act 2020 is the primary parliamentary Act to register new businesses. Depending upon the scale, NTFP/MAP based enterprises can be registered at the Company Registrar's Office (available only in Kathmandu), or District Cottage Industry Office (in all districts). Small and micro level enterprises can be registered at the municipal government under the

Local Government Operational Act and in DFO under the Forest Act. The multiple window provision on registration, however, required a number of paper trials for new enterprise registration; citizenship, land certificate, recommendation from DFO, tax clearance certificate, recommendation from local government and recommendation from land survey and a business plan.

These legal documents are time consuming and therefore increased costs. Dealing with multiple agencies substantially consume time and increase transaction costs. The important is to get clearance from land survey office confirming the distance of proposed enterprise from the forest area. Even with all these documents are available, registration get delayed with procedural and bureaucratic processes which often discourage entrepreneurs.

Solution: One window policy could reduce the time and transaction costs.

Availability of raw materials/Access to Forests

Availability of raw materials is one of the major issues in NTFP/MAP based enterprise development. In particular, existing forest regulatory provisions and associated institutional mechanism with poor governance limits the supply of raw materials. While, CFUG internal governance, timely submission of mandatory documents to DFO and Municipalities, and DFO-CFUG relations determines the harvest and timely transport of NTFPs to the market. Apart from unpredictable supply, informal payment to diverse actors and high cost of transportation due to poor infrastructure substantially increase the cost of raw material.

Solution: Strengthen CFUG capacity and their internal governance, improve DFO service delivery mechanism, and promote ex situ production of major NTFP/MAP species.

Operational Issues

Capital investment and finance, both skilled and unskilled human resources, technology and machinery, taxation and insurance are major operational issues. Presently, MAP/NTFP based enterprise are a) self-financed (mostly small and cottage), b) public grants, and c) bank loans. While grants are limited and mostly targeted for small and cottage enterprise and process oriented, bank loans are difficult to access with limited bank priority and lending capacity. With increased migration, availability of human resources is also becoming limited, as a reason, many enterprises are dependent on Indian labor force which is not reliable. Majority of existing enterprise are using old machinery and technologies, access to modern technologies require additional capital. Increasing tax, particularly after the federalism with three tiers of governments, is becoming a major challenge in NTFP/MAP based investment.

Solutions: Concessional loans with higher pay back period, tax subsidy on product, and technology support.

Marketing, Branding and Product diversification

Many of the NTFP/MAP based enterprises have been influenced by supply potential – raw material, government support, or traditional still of doing specific enterprise. Frequently interrupted supply chain and weak market information system are some of frequently faced challenges faced by Nepali entrepreneur. While there is Indian market for some products such as Kattha and several MAPs, producers have to face tough competition with Indian (and Chinese) market.

Solution: Specific and niche branding for Nepali products could help to overcome with marketing challenge and expend market.

Benefit distribution

Benefit distribution is an important issue for many community-owned NTFP/MAP enterprises. As community-based enterprise tend to invest in social and member's welfare, there is limited investment in technology and enterprise growth. As a result, most of them are struggling to sustain. Most of such enterprises initially enjoyed external financial support through grants, and are relatively weak in financial governance.

Solution: Community based MAP needs to ensure technological investment instead of waiting for multiple time grant support, as a reason, this can lead with specific business planning.

Bank loan and Lending

Forest based enterprises are generally taken with low priority for bank's loan, as collateral offered to banks are generally low in value and have less chances of recovery through the liquidation process. Lending loan for MAP/NTFP based enterprise, therefore, face pressing issues of getting loan from the bank.

Most bankers acknowledge the importance of the agriculture (including forestry) sector in Nepal's economy. However, when it comes to understanding production (crop) cycles, seasonality involved in forestry (purchase of raw materials), and the value chain of different forestry-based enterprises, many bankers do not have a clear understanding of the opportunities and risks involved, and the right approach to pricing those risks. As a reason, most banks are reluctant to offer loan to MAP/NTFP businesses. Even they offer, the bank interest rate is high which limits the capital investment in this sector.

NTFP/MAP based enterprises insurance

Existing '*Crop and Livestock Insurance Directive 2013* (BS[6] 2069)' directives make a provision of agriculture and livestock insurance through state owned insurance company (the

6 BS: Bikram Sambat, Nepalese lunisolar calendar that started from mid-April. BS is 57 years ahead of AD.

Rastriya Beema company). At the same time, Ministry of Agriculture and Livestock issues '*Crop and Livestock Subsidy Premium Insurance Directive 2014* (BS 2070)' that provision for 50% subsidy on agriculture and livestock. The amended budget for FY 2021/22 sets the subsidy to 80%. Despite many NTFP/MAP species are grown in privately owned land as that of agriculture crops, existing insurance provisions do not cover forest-based enterprises.

Solution: Incorporating the cultivated forest products in the insurance scheme could encourage smallholder farmers to grow MAP/NTFPs while increasing supply of raw materials.

8.5 5.6 Possible Financing options for NTFP/MAP based Enterprises

Based on key interviews with NTFP/MAP based entrepreneurs in Lumbini province, majority of medium and large-scale enterprise are under bank loan. Few community-owned essential oil processing owners managed to get grants for machineries and initial operation capital through the government or/and externally funded projects such as MSFP, LFP. The interest rate ranging between 11.5 – 16.0% (mean 13.7%).

With bank liquidity crunch and high interest rates, forest entrepreneurs expect public finance support either with concessional loans through banking process or public grant for machineries and technologies. However, maintaining standards of governance, effectiveness and efficiency has always been a challenge in Nepal's history of concessional loans and interest subsidy schemes especially in agricultural sector.

Based on field assessment and review of literatures, the study analyzed possible public support and enterprise operation modality for NTFP/MAP based enterprises in the Lumbini province and suggest below key dimensions to consider while providing public financial support.

8.5.1 5.6.1 Enterprise Operation Governance and Modality

There are mainly three operation and governance modality existed in NTFP/MAP based processing enterprises in Nepal.

a) *Private sector owned business:* Private and individual natural persons owned the business while associated with likeminded business association. These privately owned businesses are mostly lending loan from the banking sector, and active in market with a number of products. In Lumbini province, private sector has been investing on a) essential oil b) Resin and turpentine c) Kattha and d) Nepali paper (Lokta). These entrepreneurs also buy essential oil from smallholders' farmers and community owned small scale essential oil processing units. Majority of private sector entrepreneurs face difficulties in lending bank loan, as loan interest is very high and also collateral needed to obtain the loan. In addition, procedural formalities, including legal provisions, multiple taxation, machineries and technologies are major bottlenecks where public sector entities can facilitate the business.

b) *Government owned entity/ public enterprise*: Government owned public enterprise such as Nepal herb production and processing company (HPCCL) are engaged in essential oil business. These enterprises mostly use public funds for operation and production.
c) *Community owned processing units*: There are a number of community owned essential oil processing units under operations. These enterprises are mostly owned by community forests user groups (CFUGs), and received grants and support from the government and externally funded projects for machineries and technologies, initial operation investment capital. Despite external support, majority of these enterprises either not functional or functional with limited capacity. The commons-based enterprises success rate is found very low throughout Nepal, and also in Lumbini province.

8.5.2 5.6.2 Concessional loan for Infrastructure, technology and Business operation

Concessional loan with high pay-back period is the choice of many private businesses. The present average lending rate is about 13%, which is higher than the most NTFP/MAP based

profit margin. Private enterprise from the province argued for the concessional loan trhough banking system with around 5 to 7%. One of the Allo entrepreneur from Dang take the loan from the informal market at the rate of 24%, as bank loan access become difficult and time consuming. Another difficulty that the enterprise facing is the time duration to get loan, more often bank takes longer period to release the loan. Availability of loan during the period that they need is the prime concerns, as the seasonality matters in most NTFP/MAP based enterprises.

With present scenario of lending and access to bank loan, there is a need from provincial government to ensure concessional loan to NTFP/MAP based enterprises. Also important to ensure NTFP/MAP based enterprise be included in agriculture loan subsidy directives.

8.5.3 5.6.3 Interest subsidy

Presently, agricultural enterprises enjoy interest subsidy where banks disburse loan at base rate plus 2% premium, and 5% of the total interest is subsidized by government. This is important to discuss similar policy domain for NTFP/MAP based enterprises where provincial government can offer interest subsidy for this sub sector.

8.5.4 5.6.4 Value chain financing

NTFP/MAP based enterprise, as also discussed in previous section, possesses unique value chain and cash flow. For example, Kattha enterprise follow different cash flow and value chain than that of essential oil. Broom grass-based enterprise does have simple value chain and cash flow need. This is important for provincial government and other external support institution to understand these unique cash flow of different NTFP/MAP based enterprise and support mechanism to deal.

8.5.5 5.6.5 Financing and Financial Governance

In order to access the loan, a wide range of documents need to be provided, including the collateral guarantee. Even with all documents are provided and collateral is available, it is time consuming. Another issue is bank compliance which not every NTFP/MAP based enterprise may meet, which limits the access to loan.

Input based subsidy if not found effective, as a reason, there is a need to explore output-based subsidy. Similarly, cash based payment for grant or other subsidies may have highest chance to misuse the funds. Therefore, kind or voucher-based support is recommended.

Chaubas Saw Mill, Kavre district, Nepal

Established in 1997, four neighboring CFUG registered saw mill enterprise in small and cottage development office, with the aim of providing pine swan timber. During its initial phase, externally funded project (NACFP) provided subsidized loan and grant to establish the enterprise. The saw mill operates well in initial years,, however, could not success in later years, as the demand for swan pine timber does not receive market, and internal governance issues make more complication in operation.

In recent years, there was an attempt to revive this enterprise, and functioning well. However, there are still issues on cooperative based forest enterprises.

8.5.6 5.7 Analysis and Recommendation for Possible Management Modality(ies) for Lumbini

Common property-based enterprises are great interest and concerns of local communities, as required raw materials are mostly supplied from commons land, such as community forests. The state also does have its interest to ensure sustainability and equitable benefit sharing among the communities. As a reason, designing a common resource-based enterprise and supporting these enterprises from the public funds is important, not only to ensure community stake on enterprise, also benefit sharing among them.

There are number of modalities existed globally on these enterprises to operate. The common modality is a private run enterprise with government interventions through public policies. For example, the concept of “inclusive business” where communities are ensured with a possible buy back guarantee for their products. Another modality is based on government control over these enterprises which is not found an effective in terms of productivity. Private- public partnership is most commonly adopted during 1990s where public funds are invested together with the private entities, and stake of smallholder producers are ensured.

Community based forest user groups (CFUG, CFM) are major producers of NTFP/MAP in the province, besides private growers. Data revealed that about 70% high value MAP are still collected either from national or community-based forests. In addition, low land aromatic plants such as citronella, Mentha are also cultivated within the community managed forest area. These community-based forest user groups also collected significant amount of revenue from the sale of forest products which can be a potential investment capital for NTFP/MAP based enterprise in the province.

The Gujarat Cooperative Model for Essential Oil

Perfumers, Essence and Agarbatti Merchant Association, Rajkot (PEAMAR), Gujarat PEAMAR is an association of manufacturers and dealers of perfumes, essences and agarbattis (incense sticks) of Rajkot area in Gujarat. It was started in 1993 and presently has 90 members. Its main purpose is to safeguard the interests of the industry. It helps in making members aware of various rules and regulations governing their industry. It also provides a platform for social interaction between members as well as their families. The cooperative is functional with profit and providing support to its members on production, design and marketing.

Based on existing production system, available possible capital investment within community-based forest user groups, and also potential for ensuring community stake on NTFP/MAP based enterprises, below two major modalities are recommended for public capital support in the sector.

a) **Private enterprise:** Based on consultation with major stakeholders and review of financial and business documents, published documents, the study recommends to support private sector enterprises through a number of policy and financial measures. Key policy and financial support to private sector businesses are discussed in chapter below. Public support includes, a) capital investment for technologies as subsidized loan with long pay back period b) Tax subsidies c) reform on process and procedures such as company registration d) facilitation on buy back guarantee for smallholder producers.
b) **Community owned within the Cooperative model:** The existing Company Act does not allow community owned business registration; however, the Act is under revision with a possible provision on community-based enterprises. The Cooperative Act of Nepal allows registration and operation of member-based company or enterprises in Nepal. Although, the cooperative based saving schemes are largely criticized in Nepal recently, there are limited attempt on cooperative based enterprises in the forestry sector. Cooperative based saw mill in Kavre district is one of the examples of such attempt and success of this enterprise is largely at par.

   There are 4023 community forest user groups, managing 423,618 ha of forests in Lumbini province. Out of 4023, concept of scientific forest management for productive forests has been applied in 226 CF. In addition, eight collaborative forests management blocks are under managed in collaborative model covering 22,559 ha of forests. These community-based forest user groups collected around NRs 340 million (NRs 340,103,152) in fiscal year 2079/80 which can be the available investment capital for NTFP/MAP based enterprise. The available capital investment available within CFUG/CFM groups need to be invested largely in enterprise promotion where the Ministry of Forests and Environment plays a facilitating role to maximize the benefits from NTFP resources.

This proposed modality needs to be registered as cooperative based enterprise with investment from CFUG/CFM groups. The operation management can be developed within the private enterprise model, and cooperative can employee skilled human resources, does marketing of products, and also make contract with smallholder producers, including CFUG/CFM groups.

9. CONCLUSION

The assessment revealed that NTFP/MAP-based enterprises have a good prospect in Lumbini provinces. More than three thousand forest-based enterprises are operating in the province, out of which about 40% are directly related to MAP/NTFPs, providing direct and indirect employment opportunities for communities. Despite economic contribution of MAP/NTFP based enterprises, they are also facing a number of challenges; policy and legal frameworks, technological, human resources, financial and market.

While having multiple challenges, access to affordable, timely and accessible financing support is found critical to sustain NTFP/MAP based enterprises. Availability of raw materials and supply chain is another critical issue to sustain these enterprises, which need more investment in production system. Multiple taxation, constraints in export, lengthy process to get government permission to collect and transport raw materials are key to address to sustain susb sector business in the province.

Private sector already invested millions in essential oil, Kathha, resin and turpentine-based industries. However, they are lacking modern technologies to diversity products (such as Resin), storage and cold house. The provincial government needs to consider supporting existing businesses instead of creating new similar enterprises. For example, essential oil sector is well established in Nepalgunj, and private sector already does have knowledge on market and products. However, they are lacking some critical infrastructure such as cold house, and lab for quality control. This is important to consider while providing any public support from the provincial government. Similarly, Resin and turpentine-based industry in the province has already been established in the province, which may need additional technological support to diversify their products, other than resin and turpentine.

Community owned processing units are found not effective as that of privately owned businesses. These community owned processing units enjoys grant support from the government and externally funded projects. However, their internal governance, benefit sharing mechanism, and collective ownership is found challenging to sustain the business. Therefore, the study suggests to invest on private sector while ensuring benefits to local communities, as well.

10. RECOMMENDATIONS

Public support to existing enterprises: NTFP/MAP based enterprise is well established in Lumbini province with a significant investment from the private sector. However, private sector is facing challenges in accessing loan, new technologies and laboratory for quality control. The study suggests that the public sector support be focus on existing enterprises instead of establishing new one.

Inclusive business concept: Existing community-based processing unit for essential oil are found not much effective as that of privately owned. Therefore, the study suggests that the public support be oriented towards private sector while ensuring benefits to local communities under the concept of inclusive business.

Interest rates: The present interest rates are found 11.5 – 16.0% with a mean of 13.7%. Most entrepreneurs discussed during the assessment process suggest that if concessional loan can be accessed to promote MAP/NTFP sub sector. The existing government subsidy on interest to agriculture-based enterprise can be a good fit for NTFP/MAP based enterprise, as well.

Lending ceiling: The agricultural interest subsidy has the maximum cap of NPR 50 million i.e., entrepreneurs can receive the interest subsidy for loan amount up to NPR 50 million. If similar ceiling can be set for the NTFP/MAP-based enterprise, could be more attractive for investment in the sub sector.

Simplifying the lending process: The lending process is similar for all types of loans. Provincial government policy supporting adoption of simplified and hassle-free registration process may help these enterprises.

Investment on raw material production: Sustained supply of forest-based resources such as Khayar for Kattha, MAPs and NTFPs is one of the major concerns for investors. Continuous supply of raw materials needs to focus on production and supply. In situ cultivation of essential oil-based species, proper management of high-altitude medicinal plants need a better focus.

Business development services: There is no specific government institutions in place to provide dedicated support to forest-based enterprises, including business planning and marketing. As a reason, timely technical advice on NTFP based enterprise needs a dedicated team of experts within the provincial government.

Enterprise support modality under Inclusive Business model: Based on existing production system, available possible capital investment within community-based forest user groups, and also potential for ensuring community stake on NTFP/MAP based enterprises, below two major modalities are recommended for public capital support in the sector.

i) **Private enterprise:** Based on consultation with major stakeholders and review of financial and business documents, published documents, the study recommends to support private sector enterprises through a number of policy and financial measures. Key policy and financial support to private sector businesses are discussed in chapter below. Public support includes, a) capital investment for technologies as subsidized loan with long payback period b) Tax subsidies c) reform on process and procedures such as company registration d) facilitation on buy back guarantee for smallholder producers.

ii) **Cooperative based Enterprise:** There are 4023 community forest user groups, managing 423,618 ha of forests in Lumbini province. Out of 4023, concept of scientific forest management for productive forests has been applied in 226 CF. In addition, eight collaborative forests management blocks are under managed in collaborative model covering 22,559 ha of forests. These community-based forest user groups collected around NRs 340 million (NRs 340,103,152) in fiscal year 2079/80 which can be the available investment capital for NTFP/MAP based enterprise. The available capital investment available within CFUG/CFM groups need to be invested largely in enterprise promotion where the Ministry of Forests and Environment plays a facilitating role to maximize the benefits from NTFP resources.

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12. Annexes

12.1 Annex 1: Checklist

1. **General information:**
    a. Name and contact details of the respondent
    b. Name and address of SMEs; Year of registration/operation; number of employees
    c. Category / Sub-sectors (essential oils, plywood/veneer, ayurvedic/katha//herbal products)
    d. Ownership structure; operation modality

2. **Raw material supply:**
    a. Key raw materials
    b. Key and alternative suppliers
    c. Frequency of price change in a year
    d. Challenges faced during raw materials procurement, how these challenges are addressed?

3. **Market/demand:**
    a. Target (consumer based, secondary raw materials, domestic, export)
    b. Competitors (domestic, imports), competitive edge (quality, price, funds)
    c. Major challenges faced in acquiring consumers, how these challenges are addressed?

4. **Cost of production (for major 2-3 products):**
    a. Different costs (raw materials, production, processing, marketing, legal) for major products
    b. Which of these costs more - raw materials, production, processing, marketing, legal? Why?

5. **Financial details. If available**
    a. Total capital invested (value); breakdowns e.g., for raw material purchase, staff's, salary, marketing, others in last FY.
    b. Total revenues (income) in last FY
    c. Bookkeeping and internal reports system
    d. Source of capital (own property, loan, others)

6. **Loan:**
    a. Total loan received / Loan size
    b. Collateral
    c. Source (Banks, Dev. Banks, Finance, Cooperatives, others)
    d. Easiest and hardest medium (Banks, Dev. Banks, Finance, Cooperatives, others), why?

7. **Cash flow analysis:**
    a. Barriers for startup on managing cash flow for initial three years and strategies?
    b. Barriers for mature SMEs on managing cash flow?

c. Annual Cash flow of SMEs and identifying cost head, time, and approaches on financing.
d. Alternative mechanism and innovative approach on managing cash flow

8. Grants/ subsidies:

a. Knowledge on different grants and subsides.
b. Ever applied/received for grants/subsides? If yes, from where?
c. Ever attended some trainings, business acceleration programs? When and where?

9. Legal aspects:

a. The process of registration and operation
b. Key hurdles faced (from legal perspective) and way out suggestions (from entrepreneurs' perspective)

10. Business ambition:

a. Why engaged in this sector, and what are the opportunities?
b. Biggest challenge for company for current, and future growth (policy-legal and regulatory, practical, human resource, technology)
c. Key support needed for future growth (maximum three)

12.2 Annex 2: Persons, Institutions and Enterprise interviewed

Provincial authorities

1. Mr Mohan Kafle, Provincial Secretary
2. Mr Dadhi Lal Kandel, Provincial Forest Directorate and his team
3. Mr Keshar Khadka, Provincial ministry of forests and environment
4. Mr Damodar Sharma, Forests for Prosperity Project
5. Mr Lila Paudel, Forests for Prosperity Project
6. Mr.Sujan Dhimal ,7th level Officer-Ministry of Forests and Environment, Lumbini
7. Mr Prabhat Sapkota, DFO Rupandehi and his team
8. Mr Ajit Karna, DFO Banke and his team
9. Mr. Narayan Bhattarai DFO- DFO Palpa
10. Mr. Samyog Basnet , Officer-DFO Palpa
11. Mr. Ram Chandra lama, Officer-DFO, Palpa
12. Mr. Raju chhetri,DFO-DFO Lamahi ,Dang
13. Mr. Tek Neupane, Officer- DFO, Banke
14. Mr. Ram Prasad Sharma, JABAN and team
15. Mr. Madan Sapkota , Officer-DFO, Dang, Ghorahi
16. Mr. Tekan Prasad Acharya -DFO,Dang,Ghorahi
17. Mr. Prem Shankhar Chaudhary, DFO,Liwang,Rolpa
18. Mr. Dasharam Chaudhary, Officer-DFO, liwang, Rolpa
19. Mr. Jay prakash Gupta, Officer- DFO,Pyuthan
20. Mr. Ishwori Poudel, DFO-DFO Arghakhanchi
21. Mr. Yadav Prasad Sapkota, Information Officer-DFO, Arghakhanchi
22. Mr.Netra Bahadur Kunwar,Forester-DFO,Gulmi
23. Mr.Pankaj Kumar Thakur,DFO-DFO,Gulmi

DFO interviewed virtually

1. DFO – Kapilbastu
2. DFO- Bardiya
3. DFO – Rukum -east

Enterprises discussed

1. Daya Ram MAPs plantation Banke
2. Mohamad Azam Halwai Essential oil, Banke
3. Jhula Dangi Allo and hemp, Dang
4. Ram Sharan Chaudhari Amriso Dang
5. Shiva Raj Giri Handmade paper Dang
6. Prabhat Neupane Essential oil Kapilvastu
7. Hom Bahadur Gurung Essential oil Nawalparasi
8. Govinda Prasad Pandey Essential oil Palpa
9. Basant Rokka Chhetri Kattha Rupandehi
10. Nawaraj Rokka Chhetri Rosin / Turpentine Rupandehi
11. New Resunga Jadibuti Prasodhan Kendra , Resunga 2,Gulmi ,Nepal

Persons/Institution interviewed in Kathmandu

1. Govinda Gimire Essential oil entrepreneur
2. FNCCI/ Agriculture Enterprise Centre
3. Herbs Production and Processing Company Limited

4. Dipak Gyawali – DDG, Department of Forests and Soil Conservation
5. Dr Rajendra KC – Director General, Forest Research and Training Center

12.3 Annex 3: NTFP/MAP – district wise database

Provided in separate Excel sheet

12.4 Annex 4: Engineering Design

Provided in different design sheet

12.5 Annex 4: List of Participants in Final workshop (June 20, 2024)

1. Mohan Raj Kafle – Provincial Secretary, MoFE, Lumbini
2. Raju Chhetri- Division Head, MoFE, Lumbini
3. Surendra Pandey, Under Secretary, Ministry of Finance and Planning
4. Santosh Kumar Subedi, Undersecretary, Ministry of Industry, Tourism and Transport
5. Ganesh Ghimire, Ministry of Industry, Tourism and Transport
6. Dhanishwor Neupane, Division head, MoFE, Lumbini
7. Shanti Sharma, Sr Forest Officer, MoFE, Lumbini
8. Dila Ram Paudel, Forest Officer, MoFE, Lumbini
9. Keshar Khadka, Forest Officer, MoFE, Lumbini
10. Rabindra Khanal, Ranger, MoFE, Lumbini
11. Anil Kumar Agrahari, Engineer, MoFE, Lumbini
12. Laxmi Dutt Bhatta, Team Leader,
13. Er Raman Malla, Team member
14. Er Raj Kumar Khadka, Team member

12.6 Annex 5: Indicative work plan (four years)

				Time line (Year/Semester)																
		Enterprise	***Support***	1				2				3				4				***Other agencies***
SN	***Activity***	***type***	***sugegsted***	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1	Include MAP enterprise under agri enterprise subsidy tax	P	policy reform																	Finance Ministry, NRB, Chief minister
2	Faciliate loan subsidy, disbursement and pay back	P	Policy, finance																	NRB, Chief minister
3	Registration, one door policy	both	procedures																	Industry,
4	Registration, Community based company	C	Legal																	Chief minister , Industry,
5	Incentivize smallholder farmers and production	both	supply chain																	all relevant
6	Faciliate buy back	both	supply chain																	
7	Leverage CFUG/CFM capital investment	C	investment																	CFUG/CFM user groups
8	Support cooperative based enterprise, with matching support	C	Investment/ machinaries																	User groups
9	Support loan based capital investment	P	Investment/ machinaries																	Private enterprise
10	Branding/products	both	branding/marekting																	Industry , FNCCI, JABAN
11	Faciliate export,	P	export tax subsidy, facilitation																	Custom
12	Software, montoring, export	both	technology																	Custom
13	Quality control Lab	P	investment																	Quality control office
14	Faciliate NTFP/MAP market fair	both	marketing /sponsorhsip																	when needed