

VALUE CHAIN ANALYSIS OF SELECTED FOREST BASED PRODUCTS OF RAPTI AREA



Rupantaran Nepal
Multi Stakeholder Forestry Programme
April 2014

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Acronyms

AEC	Agro Enterprise Centre
ANSAB	Asia Network for Sustainable Agriculture and Bio resources
BDS	Business Development Services
BEE	Business Enabling Environment
BFI	Bank and Financial Institutions
BMO	Business Membership Organization
CBO	Community Based Organisation
CF	Community Forests
CFUGs	Community Forest User Groups
CoP	Cost of Production
CSIDB	Cottage and Small Industries Development Board
DCCI	District Chamber of Commerce and Industries
DCSI	Department of Cottage and Small Industries
DDC	District Development Committee
DECOS	Development Concern Society
DFID	Department for International Development
DFO	District Forest Office
DoF	Department of Forests
DPRO	District Plant Resources Office
FECOFUN	Federation of Community Forestry Users Nepal
FGD	Focus Group Discussions
FNCCI	Federation of Nepalese Chambers of Commerce and Industry
FS	Financial Services
GF	Government Managed Forest
GoN	Government of Nepal
HPPCL	Herbs Production and Processing Company Limited
HVAP	High Value Agriculture Product
HWEPC	Human Welfare and Environment Protection Centre
I/NGOs	International/ Non Governmental Organisations
IDE	International Development Enterprises
JABAN	Jadibuti Association of Nepal
LFUGs	Leasehold Forest User Groups
LIPOs	Local Implementing Partner Organizations
masl	metres above sea level
MEDEP	Micro Enterprise Development Programme
MFI	Micro Financing Institutions
MoCS	Ministry of Commerce and Supplies
MoFSC	Ministry of Forests and Soil Conservation
MSFP	Multi Stakeholder Forestry Programme
NCC	Nepal Chamber of Commerce
NEHHPA	Nepal Herbs and Herbal Products Association
NTFPs	Non Timber Forest Products
PFs	Private Forests
PPD	Plant Protection Directorate
RN	Rupantaran Nepal
RN-MSFP	Rupantaran Nepal - Multi Stakeholder Forestry Programme

RPs	Range Posts
RSDC	Rukmeli Society Development Center
RUDAS	Rural Development and Awareness Society
SDC	Swiss Agency for Development and Cooperation
SP	Selling Price
sp.	species
SWOT	Strength, Weakness, Opportunity, Threat
TCN	Timber Corporation of Nepal
TEPC	Trade and Export Promotion Centre
UNIDO	United Nations Industrial Development Organization
VCA	Value Chain Analysis
VDC	Village Development Committee

EXECUTIVE SUMMARY

Rupantaran Nepal (RN) is implementing a part of Multi Stakeholder Forestry Programme (MSFP) in five districts of Rapti Zone (Dang, Pyuthan, Rolpa, Rukum and Salyan) i.e., MSFP Lot V districts. In this context, Rupantaran Nepal - Multi Stakeholder Forestry Programme (RN-MSFP), with the objective of fulfilling **Outcome 2: Private Sector (farmers, entrepreneurs and financial institutions) increase investment and jobs in the forestry sector** of MSFP, accomplished this Value Chain Analysis (VCA) in Rapti area to identify the potential Timber and Non Timber Forest Products (NTFPs) for additional employment generation and additional investment; identify issues and constraints for the promotion of the identified commodities; recommend the strategies for upgrading each steps of value chains of the identified commodities; and ultimately to support the livelihoods of the rural communities.

Value Chains were selected and analyzed using the conventional value chain selection tools. Value Chain Upgrading Strategy (using five parameters) was used to identify the competitiveness strategy. Consultative approach was adopted for the study. A total of 12 Focus Group Discussions (FGDs) and numerous individual consultations were carried out in the five districts to capture the views, perceptions and facts. Local community members, representatives of government line agencies, representatives of I/NGOs, NTFPs traders, essential oil processors, saw mill owners, veneer industry owners and furniture industry owners participated in the FGDs. Potential commodities were identified using standard tools like free listing of commodities, attractiveness matrix and ranking matrix. Value Chains were mapped using qualitative tools (FGDs and semi structured interviews). Based on the information collected, Timur, Allo, Chiuri, Furniture and Saw mills were selected for value chain analysis. Value chain maps were prepared for thus identified five commodities. The strategic recommendations were identified using value chain upgrading strategy. Two sets of sharing workshops were organized, one at the commencement of the study and other five district level workshops, to validate the findings of the study.

The analysis of the existing gaps that need to be addressed for the functioning of the selected value chains, identified following as the major issues for the promotion of the value chains of the identified five commodities:

- ♦ Requirement of a consensus of District Forest Office (DFO), Survey Department, Department of Cottage and Small Industries (DCSI)/Cottage and Small Industries Development Board (CSIDB) and VDC/Municipality authority for forest based enterprise registration.
- ♦ Distance rule of Ministry of Forest and Soil Conservation (MoFSC) for forest based enterprises.
- ♦ Registration of rural furniture industries.
- ♦ Land and product/property ownership of the community.
- ♦ Low harvesting of timber and high price of timber.
- ♦ Multiple taxation, hurdles and unseen costs.

- ♦ Operational Plans of CFUGs that does not allow timber at subsidized cost to community based timber based industries.
- ♦ Unavailability of skilled human resources/trainers for cultivation of NTFPs in the area.
- ♦ Limited access of poor households to finance.
- ♦ Inadequate pro-poor focused activities.

The study also identified the initial activities to address the aforementioned issues. Those activities are as follows:

- ♦ Lobby to ease the forest based enterprise registration process.
- ♦ Lobby to reform or simplify the distance rule.
- ♦ Lobby to lower the price of timber (sourcing timber from government managed forests) that attracts more investment and subsequently creates more employment opportunities.
- ♦ Transform Community Forest User Groups (CFUGs) into business entities by cultivating
- ♦ NTFPs in Community Forest lands that lead to the diversification of income.
- ♦ Facilitate for scientific forest management and demonstration.
- ♦ Lease the forest as 'business enterprising'.
- ♦ Encourage the private sector and the multipurpose cooperatives to provide short and long term loan to the farmers, forest users, local entrepreneurs and collectors.
- ♦ Increase the engagement of women in forest based enterprises by providing skill trainings, connecting the trained women to the furniture enterprises and creating women friendly environment in the furniture enterprises.

Recommendations in this report are made in two domains: (a) recommendations of initial activities for value chain design and (b) specific upgrading strategies for each value chain.

Value chain analyses were carried out for the selected five commodities. Value chain maps were prepared showing the relationships of the actors, their number, their trade and transaction volume and the list of enablers. The roles and functions of the actors were presented in brief for each commodity, followed by the roles of the enablers. The supply and the demand of the selected commodities were also presented, both at national level and Rapti specific.

Value chain upgrading strategies were recommended for the selected commodities. The upgrading strategies includes:

- ♦ End market strategy was prepared based on the findings of Spiderogram that identified gaps between market requirements and present status.

- ♦ Firm level upgrading: product upgrading, process upgrading, functional upgrading, channel upgrading, transectoral upgrading and interfirm upgrading are the six upgrading parameters used for each of the identified forest products.
- ♦ Business Development and Financial services were identified for each of the five selected value chains and commercially viable options for business services were proposed.

The glimpse on the production/collection volume and the number of collectors/farmers, traders and processors for the three selected NTFPs are presented in the table below:

	Timur	Allo	Chiuri
Total production/collection	Approx. 294 tons of fruits with seeds	Approx. 150 tons of bark	22,996 tons of seeds and 9,049 tons of butter
Number of collectors	7,000-8,000	10,200	6,000
Number of village level traders	125-140	114	
Number of district level traders	30-35	15	
Number of regional level traders	4-6	2	
Number of traditional Kols			>100
Number of manufacturers/processors			4

The study estimated that about 402 furniture industries are providing employment to more than 2,400 individuals in Rapti area. The employees are earning NRs 6,000 - 10,000 per month and skilled labours are earning more than NRs 600 per day.

Concludingly, the identified five forest based commodities have potential to create employment and add more investment in the area. The areas of intervention for attaining intended outcomes are included in the proposed upgrading strategies for each commodity. The major outcomes of value chain upgrading strategy for the selected commodities are presented in the tabular form below:

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SECTION ONE: INTRODUCTION

1.1 Background

Multi Stakeholder Forestry Programme (MSFP), built on the achievements of over 20 years of forestry work of the Government of Nepal (GoN) supported by the Finland, Switzerland and UK and funded jointly by the Government of Finland (GoF), Swiss Agency for Development and Cooperation (SDC) and UK Department for International Development (DFID), aims to improve livelihoods and resilience of the poor and disadvantaged people in Nepal by maximising the contribution of the country's forestry sector to inclusive economic growth, poverty reduction and tackling climate change. By the end of the programme, following four outcomes are anticipated:

- i. Government and non-state actors (civil society, NGOs, communities and the private sector) jointly and effectively implementing inclusive forest sector strategies, policies and plans;
- ii. Private sector (farmers, entrepreneurs and financial institutions) increase investment and jobs in the forestry sector;
- iii. Rural communities - especially poor, disadvantaged and climate vulnerable people and households - benefit from local forest management and other investments; and
- iv. Forest and trees sustainably managed and monitored by government, communities and private sector and climate resilient.

The programme targets to bring an estimated 1.7 million people out of poverty by working with existing and new forestry groups of various kinds and creating an additional 80,000 jobs. In order to achieve this target, MSFP is implementing its activities in 23 focused districts through six implementing agencies.

In this background, Rupantaran Nepal (RN) is implementing a part of MSFP in five districts of Rapti Zone (Dang, Pyuthan, Rolpa, Rukum and Salyan) i.e., MSFP Lot V districts. In this context, Rupantaran Nepal - Multi Stakeholder Forestry Programme (RN-MSFP), with the objective of fulfilling Outcome 2: Private Sector (farmers, entrepreneurs and financial institutions) increase investment and jobs in the forestry sector of MSFP, accomplished this Value Chain Analysis (VCA) in Rapti area to identify the potential Timber and Non Timber Forest Products (NTFPs) for additional employment generation and additional investment; identify issues and constraints for the promotion of the identified commodities; recommend the strategies for upgrading each steps of value chains of the identified commodities; and ultimately to support the livelihoods of the rural communities. This analysis is expected to contribute to achieve RN-MSFP's target of creating additional 2,200 jobs in five districts through the optimized use of the forestry sector.

According to Kaplinsky and Morris (2001), a value chain can be defined as “the full range of activities which are required to bring a product or services from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), to delivery to final customers and final disposal after use”. The chain actors who actually transact a particular product as it moves through the value chain include input suppliers (e.g. agro-vets, nursery), farmers/collectors, traders (at different levels), processors, transporters, wholesalers, retailers and final consumers. A detailed value chain analysis is expected to identify constraints and opportunities within the chain, cost effectiveness during implementation and ensure sustainability of the enterprises (in this case forest based enterprises). In fact, RN-MSFP has planned to support the different value chain actors, particularly forest based entrepreneurs/enterprises, for the commercialization of Timber and NTFPs in Rapti area.

1.2 Objectives

In the light of the above background, this VCA of Timber and NTFPs was carried out in five districts of Rapti area with the prime objective of identifying key areas of intervention within the chain. The specific objectives of the analysis were to:

- ♦ Review and select major forest based products (at least five) for in-depth value chain analysis based on the availability, the prospects of value addition and the potential for additional employment generation.
- ♦ Identify the main actors for the selected products in the commercialization chain (from the input service provider to the collector/farmer and up to the final consumer as far as possible). Identify their specific activities and roles in each stage/step of value chain.
- ♦ Explore existing and potential marketing chain and market linkages.
- ♦ Identify demand side stakeholders and carry out demand analysis of identified products at local, regional and national level.
- ♦ Identify potential private sector and financial institutions for forestry sector job creation and investment.

1.3 Limitations

A value chain analysis involves four major steps for identification, prioritization and promotion of commodities: identification of the value chain, value chain mapping, preparing market map and upgrading strategy. The second step i.e., value chain mapping can be undertaken using various qualitative and/or quantitative tools. The quantitative tools like household survey or questionnaire are more precise and are the means to get the accurate data. However, they are time and resource consuming. Therefore, qualitative tools such as Semi Structured Interviews and Focus Group Discussions (FGDs) were used in this study.

Likewise, due to limited time for implementation, the current study prepared and analyzed the value chains of only two Timber and three NTFPs. In fact, the selection of only five commodities was helpful in ensuring focused efforts in achieving the outputs in the limited time. Nevertheless, the report has not failed to suggest key interventions for upgrading the value chains of few additional commodities (commodities that were ranked higher in few FGDs but failed to represent the Rapti area as a whole).

SECTION TWO: STUDY AREA AND METHODOLOGY

2.1 Study area

The study was carried out in five districts of Rapti zone (Dang, Pyuthan, Rolpa, Rukum and Salyan) that is the working area of RN-MSFP (Figure 1).

2.1.1 Physical characteristics

Dang is the southernmost district of Rapti zone with climate ranging from tropical to sub-tropical climate. It covers an area of 2,955 sq km with an altitude ranging from 213 - 2,058 masl. It lies within 82°2' to 82°36' E longitudes and 27°36' to 28°29' N latitudes. Maximum temperature ranges from 20.5 - 39.9°C and minimum temperature ranges from 21.8 - 2.5°C (DDC Profile Dang, 2067). On an average Dang receives 1,706 mm of rainfall annually. Dang has Siwalik range in the southern part, valley in the central part and Mahabharat hills in the northern part.



Figure 1: Five districts of Rapti zone

Pyuthan lies within the latitudes 27°55' to 28°25' N and longitudes 82°30' to 83°0' E. The total area of the district is 1,309 sq km with the altitude ranging from 305 - 3,659 masl. Due to this wide variation in altitude, climate ranging from tropical to temperate climate exists here. The average maximum temperature of the district is 23.3°C and minimum is 14.8°C with the annual precipitation of 1,294.5 mm.

Rukum is the northernmost district of Rapti zone. It lies between 28°28'04"N to 29°59'19" N latitudes and 82°11'25" E to 83°09'01" E longitudes. The area of the district is 2,877 sq km with the altitude ranging between 754-6,000 masl. The rainfall varies from 1,600 - 2,400 mm and the temperature varies from 0.4-34.4°C in a year. The climate types in the district ranges from subtropical, temperate to alpine climate.

Salyan lies within the latitudes of 27°53' to 28°31' N and longitudes of 82°00' to 82°49' E. The total area of the district is 1951.78 sq km with the altitude ranging from 326 masl (Kaprechaur, on the bank of Babai River) to 2827m (Jathaklekh, Khasrubas). Climate ranging from tropical to temperate exists in the district. Forest and rangeland occupies 65.78% of total area and the major forest types are Shorea forest, Acacia-Dalbergia forest, Terminalia-Anogissus forest, Pine forest and Schima-Castanopsis forest.

Rolpa lies within 28°8' to 28°38' N latitudes and 83°10' to 84°9' E longitudes. The total area of district is 1,871.50 sq km. The altitudinal range varies from 701-3,639 masl representing tropical, temperate and sub-alpine types of climate. Of the total land area, 94,097 ha (50.28%) is covered by forest and 32,699 ha (17.47%) by grazing land. The maximum temperature in the district is 31.2°C and the minimum temperature is 3.6°C. Similarly, the maximum rainfall in the district is 1,836 mm and the minimum rainfall is 1,388 mm. The ecological zones of the district encompasses Sal, Chir Pine, Alder, Himalayan Oak-Laurel, Mixed Rhododendron-Oak, Temperate Mountain Oak, Rhododendron, sub-alpine scrub and sub-alpine meadow forest as major vegetation types.

2.1.2 Floral diversity

With such a wide altitudinal range (213 - 6,000 masl) and diverse climatic conditions (tropical to alpine), Rapti area is rich in biodiversity – both the Timber and the NTFPs diversity. The major tree species found in Rapti zone are Sal (*Shorea robusta*), Sissoo (*Dalbergia sissoo*), Saj (*Terminalia alata*), Chiuri (*Diploknema butyracea*), Bot dhayero (*Lagerstroemia parviflora*), Chilaune (*Schima wallichii*), Katus (*Castanopsis indica*, *C. tribuloides*, *C. hystrix*), Okhar (*Juglans regia*), Salla (*Pinus roxburghii*, *P. wallichiana*), Guras (*Rhododendron arboreum*), Khasru (*Quercus* sp.), Banjh (*Quercus* sp.), Thingure salla (*Tsuga dumosa*), Talis patra (*Abies spectabilis*), Bhojpatra (*Betula alnoides*) and Dhupi (*Juniperus* sp.).

Likewise, major NTFPs found in wild in Rapti zone starting from lower to higher altitudes are Gurjo (*Tinospora cordifolia*), Pipla (*Piper longum*), Bojho (*Acorus calamus*), Amala (*Phyllanthus emblica*), Harro (*Terminalia chebula*), Barro (*Terminalia bellirica*), Tejpat (*Cinnamomum tamala*), Rittha (*Sapindus mukorossi*), Chiuri (*Diploknema butyracea*), Amriso (*Thysanolaena maxima*), Malagedi (*Cinnamomum glaucescens*), Kurilo (*Asparagus*

racemosus), Timur (*Zanthoxylum armatum*), Allo (*Girardinia diversifolia*), Chutro (*Berberis aristata*, *B. asiatica*), Kaulo (*Persea odoratissima*), Chiraito (*Swertia chirayita*), Lokta (*Daphne papyracea*, *D. bholua*), Sugandhawal (*Valeriana jatamansi*), Lauth salla (*Taxus wallichiana*), Satuwa (*Paris polyphylla*), Padamchal (*Rheum australe*), Jatamansi (*Nardostachys grandiflora*), Kutki (*Neopicrorhiza scrophulariiflora*), Bikh (*Aconitum ferox*), Yarsagumba (*Ophiocordyceps sinensis*), etc. (compiled from the Five year Plans of the five districts). Essential oil yielding plants such as Mentha (*Mentha arvensis*), Chamomile (*Matricaria chamomilla*), Lemongrass (*Cymbopogon flexuosus*), etc. are also found cultivated in the southern parts of Dang district.

2.2 Methodology

The VCA was carried out using participatory consultative approach. The existing human resources of Rupantaran Nepal were effectively used to carry out VCA at different levels and at different strategic locations.

2.2.1 Framework and approach

The Value Chain Project Cycle compiled by USAID (2008) was adopted for this assignment with some modifications (Figure 2). Value Chains were selected and analyzed using the conventional value chain selection tools. Value Chain Upgrading Strategy (using five parameters) was used to identify the competitiveness strategy.

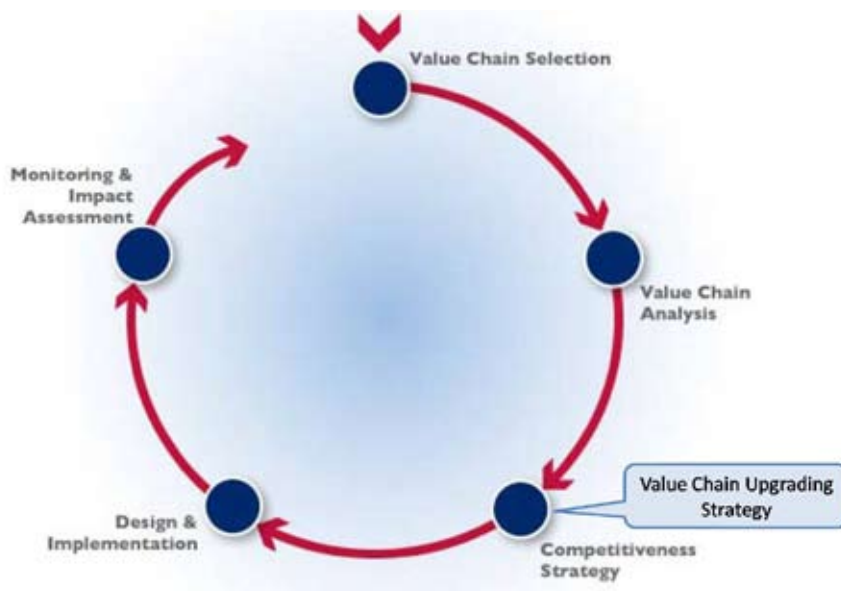


Figure 2: Value Chain Project Cycle (adapted from USAID, 2008)

Value Chain approach was followed focusing on employment generation and attracting investment in the forestry sector. Four distinct steps were followed under the Value Chain Project Cycle, which are presented in Figure 3. The first three steps were proposed by Hellin & Meijer (2006) whereas Value Chain Upgrading Strategy was proposed by UNIDO (2003).

- i. Identification of value chain (using free listing, attractiveness matrix and ranking matrix focusing on project's output related criteria. Two specific criteria and six generic criteria were used during ranking matrix);
- ii. Value chain mapping (including role and function of actors, services for creating business enabling environment using qualitative tools);
- iii. Preparing market map (including relationship of actors, overlays, listing key constraints and opportunities at each level, etc.); and
- iv. Value Chain Upgrading Strategy (using six upgrading strategies compiled by Kaplinsky et al. 2003 for UNIDO)

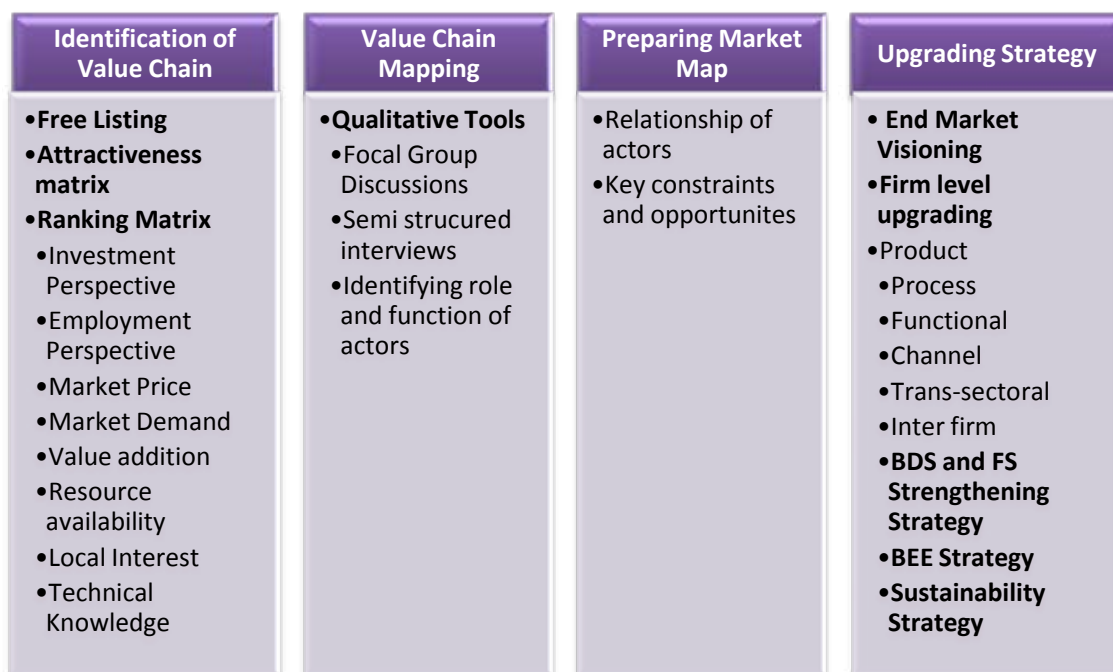


Figure 3: Steps of VCA adopted for this assignment (adapted from Hellin & Meijer, 2006 and UNIDO, 2003)

2.2.2 Methodology in detail

VCA comprised of the following key steps.

Identification of value chain

A sub-sector approach was followed to identify the value chain. Previous sub-sector study framework was referred to identify the value chain (Lotus Opportunities, 2006 and IDE, 2009). Free listing of value chain, using attractiveness matrix to sort down the value chain and using ranking matrix for final selection were the three major steps of a sub-sector analysis.

Free listing: Free listing of all potential forest products (timber and non timber) was done through literature review and group consultations. Methodologically, the perception of local communities was given the first priority, followed by the outcomes of the literature review. Resource availability was considered the major basis of free listing, followed by market demand and price.

Attractiveness matrix: Attractiveness matrix was used to narrow down the selected value chains. Potential of creating income generating opportunities and prospects of adding more investment were the two major criteria used in the attractiveness matrix (criteria that helps to achieve the MSFP Outcome 2). All the free listed forest products were fitted into the boxes as per their potentiality to meet the given two criteria (Table 1). The light green shaded boxes represents the most potential value chains in the project area. These boxes represents the clubbing up of the ranking from different focal group discussions from different district headquarters/market centers. Only the species that fell in the green shaded boxes (Medium-Medium, High-Medium; Medium-High; High-High) were considered for the further analysis.

Table 1: Attractiveness matrix

Potential to generate additional employment	High			
	Medium			
	Low			
		Low	Medium	High
	Potential to add investment			

Ranking matrix: Two specific and six generic criteria were used to prioritize the value chains (Figure 3 and Table 2). The weightage for each generic and specific criteria ranging from 1 to 5 was given for each value chains during the FGDs, with 1 being the lowest and 5 being the highest. Similarly, weightage for each generic and specific criteria ranging from 1 to 5 was given according to their importance and consultation with the experts. Final score was the result of multiplication of score given by the experts and that given by the communities for each commodity for specific and generic criteria. Criteria related to policy, gender and social inclusion were not incorporated in the ranking matrix because these are cross cutting issues and all holds almost same weightage. However, they were discussed during the analysis of the selected value chains.

Table 2: Ranking Matrix and the criteria used during the FGDs

Selected Value Chains → Generic criteria ↓	Commodity 1	Commodity 2	Commodity 3	Commodity 4	Commodity 5	Commodity 6
1. Potential for employment generation (<i>Specific</i>)						
2. Potential for private sector investment (<i>Specific</i>)						
3. Market price (<i>Generic</i>)						
4. Market demand (<i>Generic</i>)						
5. Prospects of value addition (at local level) (<i>Generic</i>)						
6. Resource availability (sustainability) (<i>Generic</i>)						
7. Technical knowledge (cultivation, harvesting) (<i>Generic</i>)						
8. Local interest (<i>Generic</i>)						
Total weight						
Ranking						

Value chain mapping: Value chain mapping was done for the commodities prioritized by the value chain selection process. Value chains were mapped and analyzed using VCA that included qualitative tools such as semi structured interviews and focal group discussions. Following parameters were considered during the analysis of the value chains of the selected commodities.

- ♦ Roles and functions of the actors
- ♦ Numbers of the actors involved
- ♦ Roles, functions and numbers of the service providers (nurseries, agro-vets)
- ♦ Availability of the services for creating business enabling environment
- ♦ Existing constraints and gaps at different levels
- ♦ Opportunities at each levels
- ♦ Quantity of transaction

Market mapping: Market map is a conceptual and practical tool that helps to identify policy issues (viz. extraneous factors) that may be hindering or enhancing the functioning of the chain and also the institutions and organizations providing the services (e.g. market information, quality standards) that the different chain actors need in order to make better informed decisions. Market map is made up of three inter-linked components (actors and their relationships, support market/enabling environment and service providers). Based on the above guidelines of market map, detail value chain maps were prepared for the identified forest based products.

Upgrading strategy: This VCA report presents upgrading strategies at different levels instead of interventions and recommendations. The strategies in the report are presented in five different parameters as mentioned in Table 3. These strategies are anticipated to provide in-depth information for the project to develop action plan for each of the strategy for value chain upgrading in coming times.

Nevertheless, the key recommendations are presented at the end of the document so that the reader/implementer finds it easy to identify the needed activities. The proposed interventions can also be taken as the summary of these strategies.

Table 3: Value Chain Upgrading Strategy Matrix

SN	Upgrading Strategy	Content	Assessment Tools
1	End market visioning	Identification of gap between actual market demand and existing status	Spiderogram
2	Firm level upgrading		
2.1	Product upgrading	Selection of competitive and comparative advantage based product for upgrading	4Ps (Product, Place, Price and Promotion) of marketing and information from Spiderogram
2.2	Process upgrading	Identification of upgrading requirements required to meet the market and the costumer demand	Process flow chart
2.3	Function upgrading	Identification of new functions to be carried out by existing value chain actors	Functional upgrading matrix
2.4	Channel upgrading	Identification of channel to be focused or new channel to be developed for the flow of product as identified in product upgrading strategy	Revised value chain/ Product flow map
2.5	Trans-sectoral and Interfirm upgrading	Identification of other inter sectoral initiatives that can be carried out by value chain actors	Value Chain actors perception
2.6	Interfirm upgrading	Possibility for value chain actors to work in coordinated way	Horizontal and Vertical linkages
3	Business Development Services (BDS) and Financial Services (FS) strengthening	Identification of the most important BDS and FS requirements for realizing above upgrading strategies	Demand and Supply side assessment of BDS and FS Services

SN	Upgrading Strategy	Content	Assessment Tools
4	Business Enabling Environment (BEE) strategy	Identification of the pertaining BEE issues and challenges	Issues and gaps identification, policy reviews
5	Sustainable strategy	Identification of the most critical factors for sustainability of value chain projects	Exit strategy formulation in each of above strategies

2.3 Dissemination of findings

One of the major components of the VCA is to disseminate the outcomes from the different phases of the study. The first sharing workshop was organized at Ghorahi, Dang. Validation workshops were organized at separately in all five districts. The inputs from the sharing workshops were incorporated in the final report.

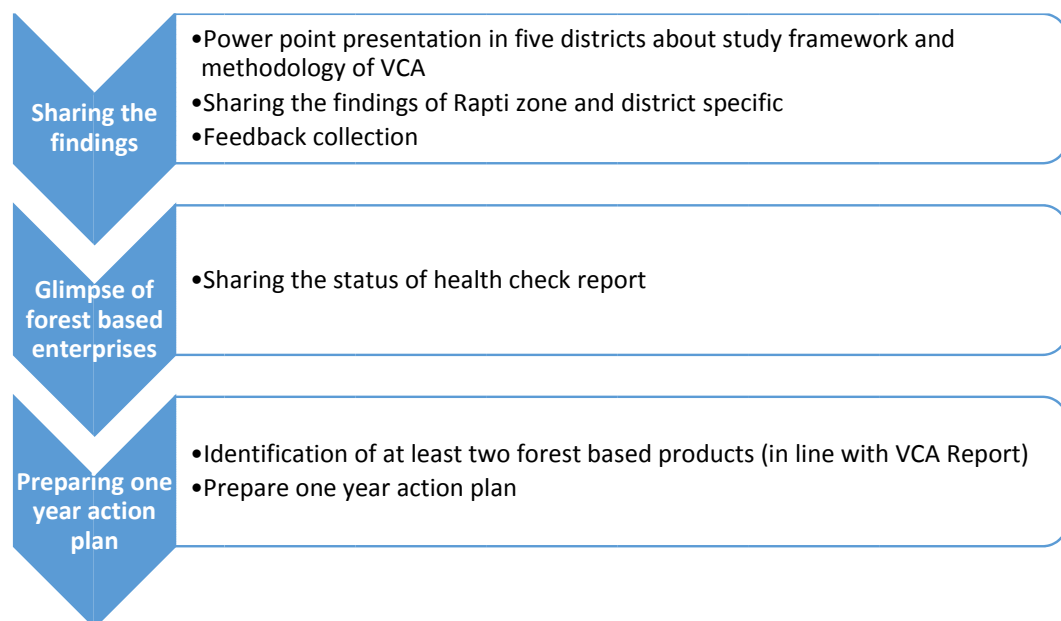


Figure 4. Dissemination of VCA findings

2.4 Implementating the Strategic Recommendations

The implementation of the strategic recommendations was ensured by providing training on the findings of the VCA to the RN-MSFP staff members (Programme Officers, Field Officers and Enterprise Development Facilitators (EDFs) - the ones responsible for the implementation of the proposed strategic recommendations.

SECTION THREE: SELECTION OF THE VALUE CHAINS

A total of 12 FGDs (Table 4) were carried out in the five districts to capture wide range of the forest products diversity. Local community members, representatives from government line agencies, representatives from I/NGOs, NTFPs traders, saw mill owners, veneer industry owners and furniture industry owners participated in the FGDs. Value chains were identified and prioritized; roles and functions of the actors were identified; volumes of trade of the prioritized commodities were estimated; and constraints, gaps and opportunities were documented during FGDs.

Table 4: Strategic local market centres where FGDs took place.

Districts	FGD Venue		
Dang	Ghorahi	Lamahi	
Pyuthan	Khalanga	Baddanda	Bahane
Rolpa	Liwang	Sulichour	Holeri
Rukum	Khalanga	Solabang	
Salyan	Tharmare	Salli Bazar	

3.1 Free listing of the commodities

Timber and non timber commodities were free listed in each FGDs. Table 5 presents the cumulative list of free listed commodities whereas Annex 1 and Annex 2 presents the free list of the commodities by districts.

Table 5: Free listed forest based commodities of Rapti zone (outcomes of 12 FGDs)

Allo	Bhringraj	Jatamasi	Malkakno	Sal leaf
Aloe vera	Bhutkesh	Jhyau	Mehendi	SallaKhoto
Amala	Bhyakur	Kafal	Mentha	Samayo
Amriso	Bikhma	Kakarsingi	Musali	Sarpagandah
Ashwoganda	Bojho	Kalmegh	Neem	Satuwa
Asuro	Chamomile	Kaulo	Nigalo	Shrikhanda
Attis	Chayu	Keura	Okhar	Silparo
Bael	Chiraito	Khayar	Orchids	Silpu
Bajradanti	Chiuri	Khoto	Paakhanbedh	Simal flower
Ban gava	Chutro	Kurilo	Paanchaaule	Sisno
Banmara	Citronella	Kutki	Padamchal	Soijan
Bans	Dalchini/Tejpat	Kyatuke	Pipla	Supha

Barro	Damar Belwar	Laligurans	Pursa Dyammur	Tare
Bee keeping	Ghodtapre	Lampate	Rakte mula	Tejpat
Bel	Gittha	Lauth salla	Ratochyau	Timur
Bhakimlo	Gurjo	Lekh paangra	Rittha	Titepati
Bhang	Harro	Lemon grass	Rosemary	Yarsagumba
Bhimal Rope	Honey	Lokta	Rudilo	
Bhorlako paat	Handicrafts	Malagedi	Saijwan	

3.2 Attractiveness matrix

Attractiveness matrix was used to sort down the free listed commodities. Potential to generate income and potential to add more investment were the two specific criteria used during the preparation of attractiveness matrix. Separate attractiveness matrices were prepared for each districts/market centres. The attractiveness matrices by districts/market centres are given in Annex 3.

It was very difficult to club the results of all 12 attractiveness matrices in a single table. But an effort has been made to club up those results. For the commodities that were repeated in several places (district headquarters/market centres), the highest rank was considered for the further analysis. For example, Timur was ranked High-High in Holeri, High-Medium in Sulichaur and Medium-Medium in Bahane, Pyuthan. Therefore, for Timur the highest rank High-High was considered for the further analysis and placed in the top right corner of the table (see Table 6).

The commodities that are listed in the top right corner of the Table 6 were the most attractive (High-High) commodities in at least one of the FGDs. Table 6 thus gives an overall picture of the potential commodities of Rapti area. Only the commodities that fall under the green shaded part were considered for ranking matrix (i.e., the commodities ranked High-High, High-Medium, Medium-High or Medium-Medium at least once during 12 FGDs).

Table 6: Clubbing up of attractiveness matrix of each 12 FGDs

Potential to generate employment	High	Vimal Rope	Tapari, Nigalo, Amriso, Amala, Harro, Barro, Wood Handicraft	Timur, Allo, Pine Resin, Saw mill, Veneer, Furniture, Chiuri, Honey bee, Bee hive, Sisnoo, Dalchini, Kurilo, Lokta, Satuwa, Bikhma, Bet-Bans (handicraft), Padamchal, Kaulo, Essential oils, Pipla, Mehendi
	Medium	Pakhanved, Chutro	Malagiri, Bojho, Lampate, Rittha, Kutki, Samayo, Neem, Okhar, Gittha, Kutki	Rato chyou, Chiraito
	Low	Silpu, Bangava, Sarpagandha, Gurjo, Bhiringraj	Laligurans, Bael	Kakadsinghi
		Low	Medium	High
Potential to add investment				

3.3 Repetition of the commodities

This was the new localized parameter developed for the prioritization of the commodities. In this step, the repetition of the commodities i.e., representation of the commodities in the FGDs was used for ranking of the commodities.

The commodities that were repeated the most were Furniture (represented in all 12 FGDs), Timur (represented in 10 out of 12 FGDs), Saw Mill (represented in 9 out of 12 FGDs), Dalchini and Veneer (represented in 8 out of 12 FGDs), Chiuri and Pine resin (represented in 7 out of 12 FGDs) and Allo and Bet/Bans/Nigalo (represented in 6 out of 12 FGDs). The commodities that were repeated less than six times (represented in less than six FGDs) were not considered “attractive” and further analysis was not done. Therefore, a total of nine commodities were considered for the ranking matrix. Otherwise, it would be difficult to compound and present the outcomes of all ranking matrix in a single table.

The commodities that were represented in less than five FGDs were as follows:

- ♦ Sisnoo Powder, Handicraft, Kaulo, Lokta, Bee Hive and Chiraito- Repeated thrice
- ♦ Rittha, Honey, Essential Oil, Satuwa, Kurilo, Tapari- Repeated twice
- ♦ Okhar, Lampate, Bojho, Malagedi, Samayo, Rato chyou, Amriso, Gittha, Bikhma, Kutki, Padamchal, Silparo, Amala, Harro, Barro, Mehendi, Pipla, Neem- Repeated once

However, it should be clear that these commodities are important in their local context regardless of their repetition (for instance, essential oil represented only in Lamahi, Dang has tremendous potential in context of Lamahi) and were thus considered separately in pocket area basis.

3.4 Ranking matrix

Six generic and two specific criteria were then used to prioritize the commodities (Table 7). The weightage ranging from 1-5 was given for each commodity during the FGDs, with 1 being the lowest and 5 being the highest. For example: weightage of 5 was given for private sector investment for furniture, while only 3 was given for technical knowledge. The given numbers in Table 7 (such as 5 for employment generation for furniture) is an average score of 12 FGDs as Furniture is represented in all 12 FGDs and in most of the cases, it scored 5. Similarly, score of 4 for employment generation for Timur is an average score of 10 FGDs as Timur is represented in 10 out of 12 FGDs.

Further, each generic and specific criteria were scored from 1 to 5 according to their importance, literature review and consultation with the experts. Employment generation and investment opportunities were the two major criteria as far as the project outputs are concerned. Therefore, they were scored 5 each. Market demand and market price are interlinked but demand always has more value than that of the price which can be exemplified by the fact that Yarsagumba and Rittha both are being marketed despite huge difference in their prices. Contrary to this, there are few instances where the market price is high but it is hard to find the demand. Therefore, market demand was scored 4 while market price was scored 3. Resource availability was scored 4 because without resource no interventions can work and the project have to shift to cultivation, which is not possible for this project because of the limited time frame. Finally, technical knowledge, prospects of value addition and local willingness each were scored 3.

The final score is a result of the multiplication of score of generic criteria and score given by communities for each commodity for specific criteria. Table 7 shows the ranking of the selected commodities. Commodities were segregated into two broad categories namely timber and non timber. They were ranked inter and intra category wise. The details of ranking matrix carried out during each FGDs is given in Annex 4.

Table 7: Ranking matrix used to prioritize the commodities

Commodities → Criteria ↓	Timber			Non Timber					
	Furniture	Saw mill	Veneer	Allo	Timur	Chiuri	Dalchini	Pine resin	Bans/Nigalo
Employment generation (5)	5 (25)	4 (20)	4 (20)	4 (20)	4 (20)	4 (20)	3 (15)	4 (20)	4 (20)
Investment opportunities (5)	5 (25)	4 (20)	5 (25)	4 (20)	4 (20)	3 (15)	3 (15)	4 (20)	3 (15)
Market price (3)	5 (15)	4 (12)	4 (12)	4 (12)	3 (9)	4 (12)	4 (12)	4 (12)	3 (9)
Market demand (4)	5 (20)	4 (16)	5 (20)	4 (16)	4 (16)	4 (16)	4 (16)	4 (16)	4 (16)
Resource availability (4)	4 (16)	4 (16)	4 (16)	4 (16)	4 (16)	4 (16)	3 (12)	4 (16)	4 (16)
Technical knowledge (3)	3 (9)	3 (9)	2 (6)	3 (9)	3 (9)	2 (6)	2 (6)	3 (9)	3 (9)
Local willingness (3)	4 (12)	4 (12)	3 (9)	4 (12)	4 (12)	3 (9)	4 (12)	3 (9)	3 (9)
Possibilities of Value addition (3)	4 (12)	4 (12)	4 (12)	4 (12)	4 (12)	4 (12)	3 (9)	3 (9)	4 (12)
Total weight	134	117	120	117	114	106	97	111	106
Category wise ranking	I	III	II	I	II	IV	V	III	IV
Overall ranking	I	III	II	III	IV	VI	VIII	V	VII

The above preferences are the results of the deliberations of the FGDs, consultation with NTFP experts and Rupantaran Nepal personnels, literature review and findings from the field.

Although, the total score received by Timur is less than that received by Allo, the former was found more attractive than the latter (Timur was found attractive in ten FGDs whereas Allo was found attractive in only six FGDs). Similarly, Dalchini was found attractive in seven FGDs while Chiuri was found attractive in six FGDs but Chiuri scored higher than Dalchini in ranking matrix. Therefore, it is evident that the selection of the commodities for the future interventions should be based on both ranking matrix (depicts the strength in terms of number) and repetition of sub sectors (more focusing on availability).

3.5 Selecting the value chains for intervention

RN-MSFP has limited time frame to achieve the outcomes envisioned by MSFP. Within the limited time frame of less than 2 years, it will be hard to intervene on new commodities and moreover, it will be hard to meet the project targets if the project diversifies its focus on too many commodities. Therefore, after the rigorous discussions among RN-MSFP personnel, it was decided that the project will focus its intervention only on two timber and three non timber products that were prioritized during the field visits. Consequently, Furniture and Saw mill were selected as two commodities in timber category and Allo, Timur and Chiuri were selected as three commodities in non timber category.

Saw mill was represented in 9 FGDs while Veneer was represented in 8 FGDs. However, Veneer received higher score in ranking matrix than Saw mill. Despite that Saw mill was selected because it has potential to engage large number of employees, can be operated in relatively low capital and can also be operated in the villages. Likewise, Chiuri was selected instead of Pine resin (Pine resin was ahead of Chiuri in ranking matrix) because there are plenty of resin industries operating in the area and it is virtually impossible and worthless to support the resin that requires enormous amount of money.

In this way, above mentioned five commodities were selected by this study. However, taking into account the huge extent of the Rapti area and its immense topographic and climatic diversity, it was assumed that the above mentioned five commodities might not represent the entire Rapti area. Thus, the study selected additional seven specific commodities for the specific pocket areas (Table 8). The interventions proposed for these additional commodities will be specific: focused towards address key gaps. Addressing those key gaps is expected to achieve the outputs of RN-MSFP.

Table 8: Commodities selected for specific interventions in specific areas (other than Timur, Allo, Furniture and Chiuri)

Districts	Market centres	Commodities Selected (to be promoted in pocket areas that covers small geographical area)	
		NTFPs	Timber and Others
Dang	Ghorahi	Dalchini	Veneer
	Lamahi	Essential oil	Veneer
Pyuthan	Khalanga	Dalchini	Veneer
	Baddanda	Honey	Bee Hive
	Bahane	Lokta	Bee Hive
Rolpa	Liwang	Dalchini	Veneer
	Sulichaur	Dalchini	Veneer
	Holeri	Dalchini	Bans (Handicraft)
Rukum	Khalanga	Honey	Bee Hive
	Solabang	Essential oil	Bans/Nigalo (Handicraft)
Salyan	Tharmare	Dalchini	Veneer
	Salli Bazar	Dalchini	Veneer

SECTION FOUR: IDENTIFYING AND ADDRESSING COMMON ISSUES AND BARRIERS

Favourable policy environment is the prime requirement for the proper functioning of the value chain. Necessity of consensus of more than half a dozen of government offices for forest based enterprise registration; MoFSC's distance rule; multiple taxation; distortion of policies, etc. are the key barriers for all value chains (both timber and non timber). These common gaps, issues and constraints are presented in this section because these barriers need to be addressed for the proper functioning of value chain.

4.1 Existing gaps and issues (generic)

The common gaps and issues that are hindering the functioning of the value chains are listed in Table 9.

Table 9: Common gaps and issues that are hindering the functioning of the value chains

SN	Gaps and Issues
1.	Registration of forest based enterprises
1.1	Requirement of a consensus of District Forest Office (DFO), Survey Department, Department of Cottage and Small Industries (DCSI)/Cottage and Small Industries Development Board (CSIDB) and VDC/Municipality for forest based enterprise registration <i>(Outcome) Most of the enterprises (especially timber based) are operating without registration, both in villages and municipalities.</i>
1.2	Distance of forest based enterprises from the forests should be at least 3 km in Hills and 5 km in Terai region <i>(Elaboration) Hilly region have fragmented forests and it is extremely difficult to find the site that is at least 3 km away from the nearest forest. This rule also affecting the furnitures entrepreneurs in Dang.</i> <i>(Outcome) Enterprises are operating without registration.</i>
2.	Price and Supply of Timber
2.1	Circular to maintain the uniform price of timber <i>(Elaboration) According to this circular, the adjoining districts should maintain uniformity in the price of timber, a district should not sell timber in price lower than its adjoining districts.</i> <i>(Outcome) Have eventually increased the rate of timber throughout Nepal.</i>

SN	Gaps and Issues
2.2	<p>Rate of timber during auction</p> <p>(Elaboration) <i>The government rate of Sal is Rs 853 per cu. ft. Timber Corporation Nepal (TCN) has fixed the minimum rate of Rs 1397.5 per cu. ft. Supreme court (on November 2012) has decided to maintain the government rate of 853 per cu. ft. but it is still not in practice.</i></p> <p>(Outcome) <i>It is the main bottleneck for timber and furniture entrepreneurs.</i></p>
2.3	<p>Multiple taxation, hurdles and unseen costs</p> <p>(Outcome) <i>Forest based entrepreneurs are obliged to pay multiple taxes (for instance at DoF, VDC, DDC, local bodies, etc.).</i></p>
3.	Enterprise growth
3.1	<p>Operational Plans (OPs) of CFUGs</p> <p>(Elaboration) <i>Community Forests (CFs) have provisions to provide timber to its users (limited quantity) but there is no provision to provide timber for community based micro enterprises. These entrepreneurs cannot purchase timber from outside because of the high price.</i></p> <p>(Outcome) <i>Future of small scale rural furniture industries is uncertain.</i></p>
3.2	<p>CFs not including collection and cultivation of NTFPs in their OPs</p> <p>(Elaboration) <i>NTFPs and other forest products cannot be collected from and/or cultivated in CFs without inclusion of these activities in their OPs.</i></p>
3.3	<p>Resource assessment of Timur and Allo is not carried out in Rapti area</p> <p>(Elaboration) <i>Resource quantification is necessary for the sustainability of NTFPs and it also helps to estimate the productivity of forest based enterprises.</i></p>
4.	Knowledge
4.1	<p>Cultivation of identified NTFPs not institutionalized in Rapti area</p> <p>(Outcome) <i>It is hard to meet the demand of traders without mass production.</i></p>
4.2	<p>Very few professionals who are cultivating Timur and Chiuri in Rapti area</p> <p>(Elaboration) <i>Commercial cultivation does not succeed unless and until a skilled trainer provides round the clock advisory services.</i></p>

SN	Gaps and Issues
5.	Finance
5.1	Access to Finance (Elaboration) Generally the collection and small scale cultivation of NTFPs is carried out by the farmers with limited income generating opportunities. They do not have enough capital to bear the cultivation cost.
5.2	Inadequate roadmap for Micro Financing Institutions (MFIs) to invest in herbal sector (Elaboration) MFIs are still reluctant to invest in the herbal sector because of the prolonged payback period and most importantly, due to inadequate information.
5.3	Inadequate pro-poor focused activities (Elaboration) Poor can be engaged in the cultivation of NTFPs in the CFs but it is not in practice in most of the CFs of Rapti area. Other pro-poor focused activities such as establishing common drying centres and collective marketing scheme are in demand in Rapti area
5.4	Most of the forest based entrepreneurs do not have adequate financial capital for the industry establishment (Activity) Need to link the furniture industries with resourceful CFUGs, cooperatives, banks, etc. and facilitate to provide collateral free loan.

4.2 Constraints (generic)

Apart from the above mentioned gaps, there are also few constraints in the value chain of furniture industries (given in Table 10).

Table 10: Constraints in Furniture Value Chain.

SN	Constraints
1	Access to transportation (Elaboration) It is very difficult for forest based entrepreneurs (furniture and saw mills) to introduce sophisticated equipment in the remote areas of Rapti zone.
2	Labour issue (Elaboration) Unavailability of human resource (skilled and unskilled human resource) in the country due to labour migration to Malaysia and Gulf countries.

4.3 Opportunities

Despite having some gaps and constraints, there are also few opportunities to promote the forest based enterprises in Rapti area (Table 11).

Table 11: Opportunities to promote forest based enterprises in Rapti area

SN	Opportunities
1	Presence of NGOs, CBOs and bilateral aid agencies - Several NGOs, CBOs and bilateral aid agencies and programs are implementing its activities focusing on NTFPs in Rapti area.
2	Plenty of abandoned lands - Migration to Gulf countries and Malaysia is a big issue of Rapti area. There are plenty of abandoned land that provides an opportunity to cultivate NTFPs.
3	Collaboration with CFUGs - Given the permission, CFUG can cultivate NTFPs. CFUGs have inadequate start up capital and this can prove to be an opportunity for partnerships of the private sector with the CFUGs.

4.4 Addressing the generic issues

Table 12 lists out the initial activities that need to be undertaken for improved value chain designing as is recommended by this report. These recommendations are general ones and they are in line with the identified gaps and issues (Part 4.1). This list of activities can be considered as initial activities before realizing specific upgrading strategies of each product. Thus, recommendations in this report are made in two domains:

- ♦ Recommendation of initial activities for value chain design
- ♦ Specific upgrading strategies for each value chain

This section deals with the recommendation of initial activities for value chain design and specific upgrading strategies are mentioned in relevant value chain analysis sections under “value chain upgrading strategy”.

Table 12: Recommendation of initial activities for Value Chain designing

SN	Activities	Outputs	Who should address
1.	Lobby to ease the registration process	Easy registration for forest based enterprises	MSFP, RN, Commodity Associations, Federations
2.	Reforming or simplifying the distance rule	Registration of almost all forest based enterprises, Additional revenue to the government	DCSI, MoFSC, Commodity Associations, Federations, MSFP, RN

SN	Activities	Outputs	Who should address
3.	Lobby to lower the price of timber	More engagement in the forestry sector; decreased import of timber, furniture and aluminium; credible business	MoFSC, TCN, MSFP, Commodity Associations, Federations
4.	Encouraging potential CFUGs to involve in commercialization of timber and NTFPS by cultivating NTFPs	Diversification of income generating opportunities; poverty reduction; reduce pressure on the wild	DoF, DFO, RN, MSFP
5.	Disseminating the knowledge on cultivation, processing and marketing	Farmers getting the optimum price, low wastage	Projects
6.	Leasing the forest for scientific management and enterprising	Private sector engagement in the forestry sector; additional revenue generation to the government; sustainable management of raw materials for enterprising; prosperity of the communities	MoFSC, MoI&S, MoF, MSFP (some pocket areas)
7.	Increase access to finance of poor, women, disadvantaged groups and entrepreneurs	More and more entrepreneurs at rural areas	Projects, Bank and Financial Institutions

4.5 Gender/Social Inclusion

Engagement of women is visible in the NTFPs sector. Women are engaged in collection and processing of Timur, Allo and Chiuri. The engagement is more visible in Allo value chain where they are involved in collection, processing (from dried bark to fibre making), weaving (which is entirely done by women), making cloth and marketing. Most of the Allo enterprises are run by women or groups of women. Likewise, collection of Chiuri and processing to extract ghee from traditional Kols are mostly done by women.

However, their engagement is minimal in furniture enterprises and none in the saw mills. Women involvement is only seen in large furniture enterprises especially in the work of sanding, staining, colouring and finishing and in sales outlets. The main actors of furniture value chain and women involvement is presented in Table 13.

Table 13: Main actors of furniture value chain and women involvement

Actors	Owned & operated by	Supporting function of women	Main factor for absence/ presence of women	Potential women involvement	Strategic options
Rural Enterprises	Male	None directly in enterprises	Labour intensiveness	Sanding; staining; colouring; and finishing	Awareness raising to women in enterprises
Market Centre Manufacturers	Male	Presence of women in outlet	Labour Intensiveness, Lack of women friendly environment	Sanding; staining; colouring; and finishing	Where women involvement is being practiced
Sales outlets	Male/ Female	Presence of women in marketing outlets	NA	Ownership; marketing; sales; account keeping	NA
Technicians (Mistris)	Male	None	Mistris work as single or with male assistant, Lack of women friendly environment	NA	NA
Urban Industries	Male	Presence in large industries but absence in medium and small industries	Labour Intensiveness; Lack of women friendly environment	Sanding; staining; colouring; finishing; and compressing	Creating women friendly environment
Importers	Male	Presence of women in sales outlets	Good marketing skills; trustworthiness	NA	NA

SECTION FIVE: VALUE CHAIN ANALYSIS OF TIMUR

5.1 Introduction of Timur

Timur (**Botanical name** - *Zanthoxylum armatum*; **English name** - Prickly Ash) is an important medicinal plant that belongs to Rutaceae family. Eight species of *Zanthoxylum* are reported from different parts of Nepal. Of which, *Zanthoxylum armatum* is the most widely used species. This section of this report deals with the value chain analysis of Timur of Rapti area.

5.1.1 Habit (characteristics)

Timur is a shrub or small tree often reaching up to 5m in height, with corky bark and numerous long straight spines on branchlets and leaf-stalks. Leaves are opposite, pinnately compound with narrowly winged stalk. Leaflets are 2-6 paired, ovate to lanceolate, 8cm, toothed, sparsely gland-dotted. Flowers are green or yellow colored and appear in short branched lateral clusters. Flowers are very small: about 1mm in size and are unisexual. Ripe capsules are 3-4mm in size, globular, red, wrinkled and aromatic. Seeds are shining black in colour with an aromatic husk which becomes red on maturity. Branchlets, leaves, fruits and seeds are also aromatic. Flowering occurs in April-May and fruiting in July-November. Fruits take 6-8 months to mature (Polunin and Stainton, 1984, Ghimire et al., 2008b, Pyakurel and Baniya, 2011).



Picture 1: Timur in wild habitat (left) and dried Timur fruits (right) - both pictures were taken by D. Pyakurel.

5.1.2 Habitat and distribution

Timur appears as shrubberies on cleared forests, degraded slopes and on the edges of cultivated lands. It grows naturally in well drained soils and survives on soils with low

fertility and resists strong acidity. It generally prefers moist, semi-shaded or light shaded conditions and hardly thrives in dense forest with maximum crown cover. It grows well in farmlands and wastelands than in natural forests. The plant cannot withstand hailstone and storms during the flowering season. In natural forests, it is associated with *Berberis aristata*, *Castanopsis indica*, *Castanopsis tribuloides*, *Pinus roxburghii*, *Pyracantha crenulata*, *Pyrus pashia*, *Quercus lamellosa*, *Quercus lanata*, *Quercus leucotrichophora*, *Rhododendron arboretum*, etc. (Pyakurel and Baniya, 2011). Timur is naturally distributed in more than 30 districts within the altitudinal range of 1100m to 2500m. Mid-Western districts like Rolpa, Rukum, Salyan, Pyuthan, Dang, Surkhet, Gulmi, Baglung and Jajarkot are the prime habitats for Timur.

5.1.3 Uses of Timur and its oil

Timur has a wide range of traditional, medicinal and commercial importance. Timur fruits are used in traditional and modern medications. Their uses are explicitly mentioned in Ayurveda. Fruits are pickled and also used as spices. The fruits are used in cough and cold, tonsillitis, headache, fever, toothache, altitude sickness, dizziness, diarrhoea and dysentery. Fruits are traded all over Nepal due to their wide range of domestic uses.

Essential oil extracted from the dried fruits of Timur is traded in national and international markets. The oil has wide range of therapeutic uses and also used to manufacture pharmaceutical products, flavoring agents and in perfumery (used in fragrance). The oil possesses disinfectant, deodorant and antiseptic properties.

5.2 Supply Chain of Timur and its oil

Most of the Timur collected from the five districts of Rapti zone are transported to their respective district headquarters or nearby market centers (e.g., Sulichaur, Holeri, Sallibazar, Srinagar, Tharmare, Tulsipur, etc). They are either traded in retail at Haat bazaar (weekly market center in the village which is very common in the rural areas of Nepal), or sold to the district level traders who in turn sell them to regional level traders in raw form or to the essential oil entrepreneurs within the district. The district level traders sell Timur to regional traders stationed at Tulsipur, Nepalgunj, Krishnanagar or Kathmandu. All the collected and cultivated Timur are traded in raw form from the districts.

Timur (*Zanthoxylum*) oil is not extracted in Rapti zone but the entrepreneurs from other parts of the country purchase the Timur from Rapti zone, extract essential oil and sell it to the herbal products based companies or to the traders/exporters. The herbal products based companies produce different health care products and sell them to the domestic market. The exporters export *Zanthoxylum* oil to India and the third countries. It is estimated that more than 90% of *Zanthoxylum* oil are exported, while only 10% are consumed domestically. Income is shared among the rural collectors, the traders (at different levels) and the processors. A simplified supply chain of raw Timur and *Zanthoxylum* oil in Nepal is given below:

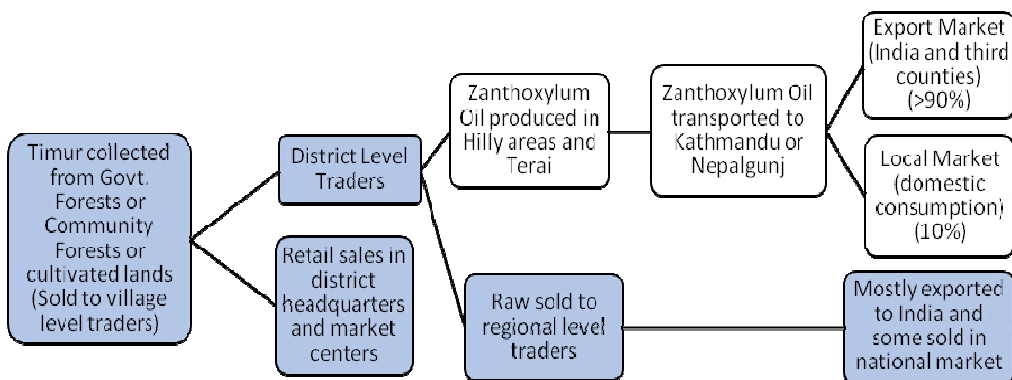


Figure 5: Supply Chain of Timur and Zanthoxylum oil. Only the raw Timur is traded within the Rapti zone. The shaded box shows the existing supply chain (adapted from GIZ, 2007).

5.3 Value chain map of Timur and its oil

Figure 6 presents the value chain map of Timur in the Rapti zone of Nepal with the major functions in the chain, key actors, market channels, their vertical and horizontal relationship and the existence of various facilitating and regulating agencies.

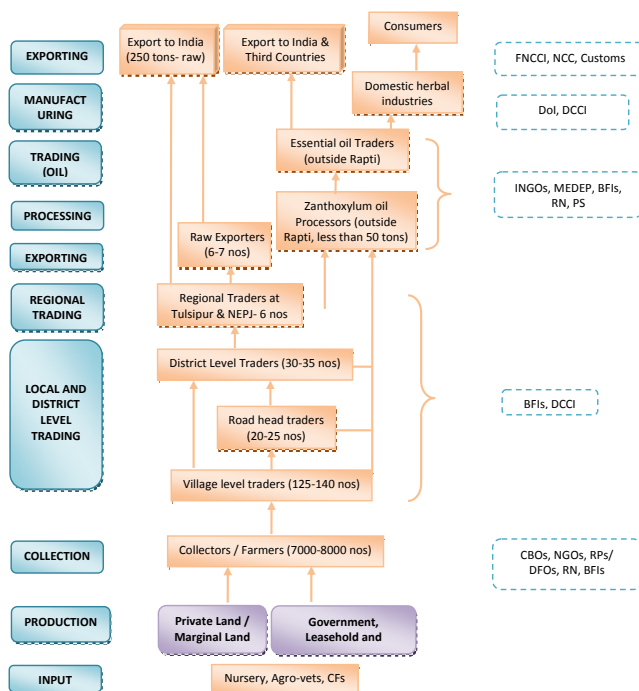


Figure 6: Value Chain Map of Timur in Rapti Zone.

5.3.1 Role and function of actors and their relationship

Actors involved in Timur value chain can be categorized into different types according to their functions along the chain. They are farmers/collectors, village level traders, road head traders, district level traders, regional traders, processors, manufacturers, exporters, retailers and end users. Short description of each actor and their respective functions are described as follow:

Farmers/Collectors: Farmers/collectors are the primary actors of the value chain. About 7,000 to 8,000 households are engaged in collection/farming of Timur in four districts of Rapti zone, except for Dang (FGDs, HVAP 2011). Most of the collectors are either women or members of disadvantaged groups (poor, ethnic minorities, Dalits, etc.) who have little access to finance. The collectors harvest Timur from Government Forests (GFs), Leasehold Forests (LFs) and CFs whereas farmers harvest Timur from private lands and mostly sell them to village level traders with none or minimal value addition activities. Group marketing is not recorded from the districts. The farmers are selling raw Timur (with seeds) at Rs 60-65 per kg to village level traders. Average volume of Timur collected and traded from Rapti zone is estimated to be between 270 tons to 300 tons per year. In fiscal year 2012/013, a total of 293,840 kg of Timur was collected from the four districts of Rapti zone.

Village level and Road-head Traders: Village level traders act as a bridge between demand and supply. They purchase Timur from collectors and farmers and sell to the district level traders. There are 125-140 village level traders in the four districts (except for Dang). Most of traders have their own retail shop of food items, grocery items, clothes and hardware (as evident in Holeri-Rolpa and Sulichaur-Rolpa) thus collectors sell Timur and buy the necessary materials from them. Bulk of the local production is collected by them whereas some are purchased directly by the agents of district level traders.

Sometimes road head traders purchase Timur from the village level traders, but with the advancement in communication and expansion of road network, their role has been minimized. Village level traders often contact the district level traders and sometimes to regional traders. However, in most of the cases, village level traders sell the commodity to the district level traders.

District Level Traders: District level traders often pay in advance to the village level traders well before collection time. District level traders collect the commodity in bulk and after receiving the transport permit from DFO, sell the same to the regional traders who are mostly situated in Nepalgunj, Krishnanagar, Bhairahawa or Kathmandu. The most preferred routes for Timur trade in Rapti zone is towards Nepalgunj via Amelia (Tulsipur) and Krishnagar (via Ghorahi). Altogether there are 30-35 district level traders in five districts (seven locations) of Rapti zone and are stationed in Salli bazar, Ghorahi, Tulsipur, Liwang, Sulichaur, Salyan Khalanga, Rukum Khalanga and Pyuthan Khalanga (outcome of FGDs).

Regional Level Traders: The regional traders purchase Timur mostly from district level traders and sell the product to Nepalgunj, Krishnanagar, Bhairahawa based processors and

exporters (raw or processed). Sometimes the regional traders directly export to India. There are not more than 6 regional traders, situated mostly in Tulispur and Ghorahi.

Raw Exporters: Exporters stationed at Nepalgunj, Bhairahawa and Krishnanagar purchase Timur from regional level traders and export to India via respective customs. Regional traders from Rapti area mostly sell Timur to exporters in Nepalgunj, Bhairahawa and Krishnanagar.

Essential oil Processors: The trade of Zanthoxylum oil is flourishing with the advancement in technology and higher demand for essential oils from European market. However, there is not a single Zanthoxylum oil processor in Rapti zone.

Essential oil Traders/Exporters: Though the Zanthoxylum oil is not produced in Rapti zone and most of the collected Timur are exported to India, essential oil exporters (mainly located in Nepalgunj, Dang, Krishnanagar, Bhairahawa and Kathmandu) purchase Zanthoxylum oil from other parts of Nepal and export to Indian and European market. Some quantities are consumed at local level to produce herbal healthcare products like Sancho, dentifrice, etc.

Manufacturers: Companies like Dabur Nepal, HPPCL and other herbal companies are manufacturing different products from Timur and Zanthoxylum oil. The oil is an essential ingredient of Sancho, a trademark product of HPPCL. Likewise, Dabur Nepal is manufacturing different products (tooth paste, dentifrice) by using Timur and Zanthoxylum oil. The final products are mostly sold in national market whereas Dabur Nepal is also exporting the products.

Service Providers: Service providers are not addressed as actors. They especially provide services to the producers. Nurseries (who provide seedlings and saplings), agrovets (provides herbicide, pesticide, insecticide and seed) are identified as service providers. Agrovets are available in all five district headquarters and major market centers (Sulichaur-Rolpa, Baddanda-Pyuthan, Salli bazar-Salyan, etc.). But specific roles of service providers in the Timur value chain were not observed. However, it can be anticipated that few nurseries are providing Timur cuttings to farmers via developmental organizations and CBOs or NGOs.

5.3.2 Enablers

Enablers of Timur value chain are those who work for the value chain actors and provide facilitating and regulating supports. Activities of enablers ranged from production to final consumption including technology, product development, advocacy for simplifying trade policy and procedures, organizing groups and networks for reinforcement and market information and linkages for better access. Regulating agencies are also working as a facilitator in many cases (HVAP, 2011). The major facilitating organizations and regulating agencies and their activities is given in Table 14.

Table 14: List of enablers and facilitating organizations in Timur Value Chain

Major Activities	Facilitating Organizations	Regulating Organizations
Seedlings and Nursery management trainings	RN	DFO, DPRO
Registration of forests and rangelands for cultivation of Timur	FECOFUN, RN	DFO
Collection permit, License		DFO, CFUGs, LFUGs
Harvesting and post harvesting organizations		DFO, CFUGs, LFUGs
Royalty exemption	CFUGs, LFUGs	DFO
Transport/Export permit		DFO
Local taxes		DDC, VDC
Production of essential oils	RN-MSFP	DCCI, DCSI
Processing technology	RN-MSFP	
Market Information	JABAN, ANSAB, RN	
Resource management	FUGs, RN	DFO, DPRO

Enablers in Production and Local Processing Functions: District Forest Office and District Plant and Resources Office are the responsible agencies for providing technical support on cultivation, harvesting, local processing and trading in this value chain. Those agencies also regulate the functions from production to sale through monitoring, licensing, product verifying and levying royalty, fees and tax. Similarly, organizations like RN are working for the programme implementation at local level. Microfinance institutions and cooperatives are assisting farmers and collectors by providing soft loans. Village level traders are also providing loan to the collectors.

Enablers in Trading and Export Functions: At traders' level, Business Membership Organizations' (BMOs) like Jadibuti Association of Nepal (JABAN), Nepal Herbs and Herbal Products Association (NEHHPA), District Chamber of Commerce and Industries (DCCI) are supporting for the sector's business activities. Agro Enterprise Centre (AEC) is working in the area of market development by providing market information, facilitating for market linkages, etc. Similarly, Trade and Export Promotion Centre (TEPC) assist in export of goods and maintain the export data. The mission of this centre is to expand and strengthen market oriented private sector driven agro enterprises in order to increase the value and volume of high-value products sold domestically and internationally. Plant Protection Directorate (PPD) is responsible for the programme implementation on the Plant Protection Sector (During export of Timur, the plant quarantine offices work on legal formalities of export). Ministry of Forest and Soil Conservation (MoFSC), Department of Forest (DoF), Department of Plant Resources (DPR), Ministry of Commerce and Supplies (MoCS) and Federation of

Nepalese Chambers of Commerce and Industry (FNCCI) are business enablers at higher levels and they facilitate business through policy lobbying, policy formulation and bilateral trade agreements.

5.4 Economic analysis of Timur and its oil

According to the MIS price list published by ANSAB, the average annual price of Timur with seed ranged from as low as Rs 44/kg in 2007 to as high as Rs 210/kg in September 2013 in last seven years. However, the collectors are receiving the price of Rs 110/kg. The premium price for the good quality Timur is not in practice in the project area. The price fluctuation and the lack of practice of premium price have discouraged the farmers and collectors of Timur in the project area.

A collector can harvest upto 4kg fruit from wild or about 5kg from cultivated area in a day. Collection of Timur from wild is a supplementary income generation activity and the amount provides substantial support for disadvantaged groups and farmers with low land holdings. Additionally, for Timur harvested from the wild, the investment is just the labour. Unlike in the case of cultivation, there is no other investment.

Zanthoxylum oil is extracted from dried fruits of Timur. The fruits yield up to 6% of Zanthoxylum oil, but in average 4% oil has been extracted at commercial level. The price of oil has fluctuated between Rs 1,800 - 5,500/kg.

5.4.1 Timur cultivation and sustainable management

The details on Timur cultivation, its sustainable management, cultivation cost, fixed capital requirement, pre operating cost, initial working capital, per batch extraction cost of Zanthoxylum oil and total profit is given in Annex 5.

5.4.2 Cultivation cost

The per hectare cost of cultivation of Timur is Rs 65,500 for first year, Rs 28,900 for second year and Rs 54,900 for third year. The expert consultation cost is kept Rs 20,000 collectively. Thus, the total per hectare cost of cultivation is Rs 169,300 for three years. About 3,500 kg of Timur can be produced in a hectare of land and if sold at Rs 100 per kg (November, 2013), the total sales will be Rs 350,000. Thus, the profit per year per hectare is estimated to be around Rs 60,200.

5.4.3 Value addition

Essential oil production is the most preferred value addition for Timur. The fixed capital requirement to establish essential oil enterprise is estimated to be Rs 801,380; pre operating cost is estimated to be Rs 10,000 and the initial working capital is estimated to be Rs 411,240. The estimated unit cost of production per batch is Rs 3,070. Even if the Timur is purchased at Rs 110/kg, the total profit from one kg of Zanthoxylum oil is approximately Rs 2,073 (refer to Annex 5).

5.5 Supply and demand

5.5.1 Production/supply

National Production: About 850 to 1,100 tons of Timur is collected annually in Nepal with India as the principal buyer that purchases about 80% in raw form. Some European countries namely France, Italy, Belgium, Germany and UK have a demand of about 150 kg Zanthoxylum oil from Nepal (HVAP, 2011).

Timur fruits are now-a-days sold at local, regional and national market for spices. More than dozen of trading companies are exporting Zanthoxylum oil in international market, the major market being Europe. The biggest buyer of Timur with seed for processing in the country is Dabur Nepal (200 MT annually). Recently, Gyan Herbal has started buying (50 MT) for trading and oil processing. Bahubali Herbal has been involved in trading and production of Zanthoxylum oil since 1996. Similarly, HPPCL has a demand of more than 200 kg of Timur oil (equivalent to 6.6 MT raw; 3% yield) for using it as a major ingredient in Sancho. Similarly, many other ayurvedic companies and dentifrice industries have demand of Timur in Nepal but their volume of demand is yet to be quantified. Nepal exported the highest quantity of Timur in 2003 that was 650 MT. However, there was reduction in the volume of export in the subsequent years, with a record low 280 MT export in 2006. It is believed that the low demand in these years were because of two reasons: first - mixing of foreign materials gave negative impression to the buyers and second - some big buyers/stockist kept a large quantity of Timur in their stores (HVAP, 2011).

Production of Timur in Rapti zone: Rapti zone is regarded as the prime habitat of Timur in Nepal. Timur from Salyan is considered the best because of its high oil content. Similarly, Rolpa and Pyuthan are also known for the distribution of Timur. A total of 293,840 kg (181,840 kg from Salyan; 70,000 kg from Rolpa; 30,000 kg from Rukum; and 12,000 kg from Pyuthan) of Timur was collected from Rapti area in FY 2012/013.

5.5.2 End Market/ demand

There is no recorded data of household consumption of Timur in Nepal. It has been estimated that 5% households of Nepal use 10 gm timur annually per household as a spice. The product is found in many places or markets in the country for sale. However, Dang, Nepalgunj, Kapilvastu, Butwal and Kathmandu are the major markets in Nepal. Among them, Kathmandu can be considered as the end market for both the oil and raw form of Timur in terms of household consumption, industrial and ayurvedic uses. Tanakpur, Lucknow, New Delhi and Kolkata are the major trading centres in India. Similarly, France, Belgium, Germany, UK and USA are the overseas markets for oil.

5.6 SWOT analysis of Timur

The SWOT analysis of Timur was carried out focusing on the trade and market of Timur.

Table 15: SWOT Analysis of Timur Value Chain

Strength	Weakness
<ul style="list-style-type: none"> ➤ Good demand in Indian market since 1980s and oil is considered as a new product in Western Market ➤ Grading and value addition possibilities ➤ Local demand for <i>chutney</i> ➤ Can be used as bio-pesticides for soil treatment and protecting grain from insects in grain storage ➤ Export volume of Timur is large compared to that of other herbs ➤ Traditional Knowledge on collection ➤ Easy cultivation in marginal land (private lands and CFs) ➤ Rare infestation of diseases and pest ➤ Favorable geo-climatic condition and possibilities of natural regeneration ➤ Timur is a prioritized commodity for export ➤ Good incentive to promote export as there are no fees (any type) and local levy on the transportation within the country ➤ Easy to handle, store and package 	<ul style="list-style-type: none"> ➤ Limited in scale: cultivation in small patches and collection from limited area limits the access to buyers; and little initiation has been taken towards promoting cultivation and maintaining proper spacing for promoting natural generation ➤ Difficult to harvest due to thorns ➤ Collectors often lop off the branches while collecting: such practice decreases subsequent fruit production ➤ Early harvesting is in practice that causes fungus development in the dried product and loss in dry weight ➤ Inadequate quality control: mixing of other materials (tigedi, thrones, stems, dust, kala dana, etc.) in seed decreases the quality of the product
Opportunities	Threats
<ul style="list-style-type: none"> ➤ High priority product for export ➤ High scope to increase productivity ➤ Availability of distillation unit within the country ➤ Possibility of value addition within the country ➤ Appropriate for DAG engagement and income generation 	<ul style="list-style-type: none"> ➤ Fluctuating market price ➤ Higher dependency to the Indian market

The market based solutions to the identified weaknesses and threats to tap the existing opportunities are provided as BDS strategy in the next section as a part of Value Chain Upgrading Strategy.

5.7 Value chain upgrading strategy

As mentioned earlier in the methodology, upgrading strategies at different levels (instead of interventions and recommendations) are proposed in this report. The value chain upgrading strategies for Timur are presented considering the six parameters as given in Table 3. These strategies are expected to provide in-depth information to the project to develop action plan for each of the strategy for value chain upgrading in coming times. The strategy for upgrading Timur value chain is presented as:

5.7.1 End market strategy

End market strategy is prepared to fulfil the gap between market requirements and present status. Spiderogram is used to present the end market strategy. In case of Timur, six parameters were used to prepare spiderogram (Figure 7).

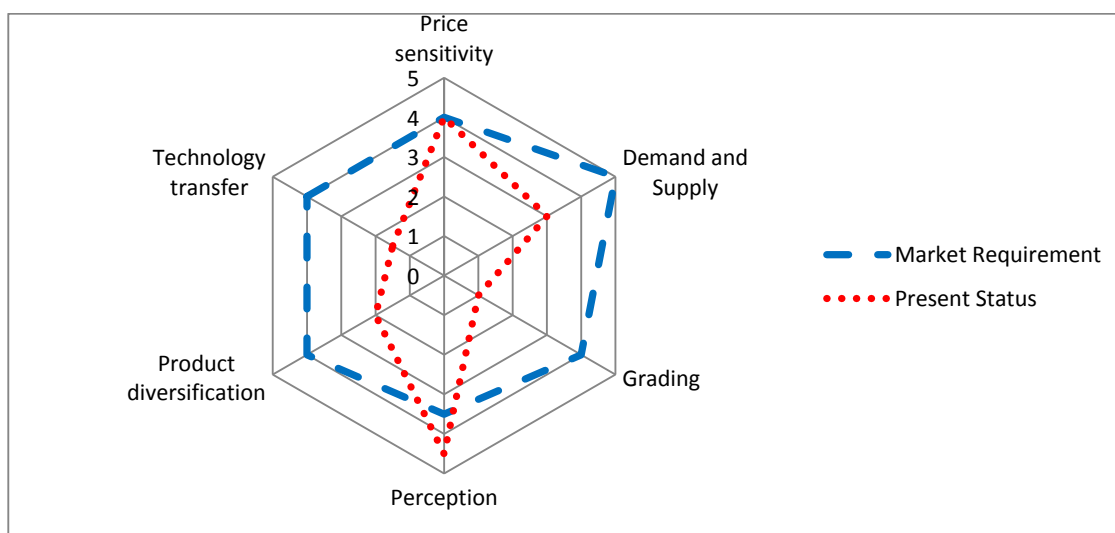


Figure 7: Spiderogram showing the gap between market requirements and present status of Timur Value Chain

The score ranging from 1 - 5 was given based on the parameters given in the Table 16.

Table 16: Parameters used for preparation of the end market strategy of Timur Value Chain

Parameters	1	2	3	4	5
Price Sensitivity	Worst price negotiation between buyers and sellers	Weak price negotiation between buyers and sellers	Moderate price negotiation between buyers and sellers	Good price negotiation between buyers and sellers	Best price negotiation between buyers and sellers

Parameters	1	2	3	4	5
Demand and Supply	Low demand and supply	Limited demand & supply	Moderate demand and supply	Good demand and supply	Mass demand and supply
Grading	Mixing with other seeds	Cleaning	Grading: Small, Medium, Large	Grading and Pricing: Small, Medium, Large	Grading, Pricing, Ecological advantage
Perception	Inferior	Low	Moderate	Good	Excellent
Product diversification	Single product line	More than two product lines with unequal volume	More than one product lines with equal volume	More than one product lines with equal volume and grade product	More than one product lines with equal volume, grade product, minimization of wastage
Technology transfer	Technology used in one process (input/production/post harvesting/extraction)	Technology used in more than one processes	Technology used in more than one processes and meeting national standard (GAP) ¹	Technology used in all the processes and meeting national standard (GAP)	Technology used in all the processed and meeting national (GAP) and international standard (FAIR WILD, Forest Certification, etc.)

This shows that the strategy has to be focused on reducing the gaps in terms of:

- Grading of Timur;
- Technology transfer for process efficiency, reduction in production cost and increase value addition;
- Product diversification; and
- Meeting increasing demand.

¹ Department of Plant Resources is about to publish Good Agriculture Practice (GAP) in Timur.

5.7.2 Firm level upgrading

Product Upgrading

The product upgrading is based on three years plan. Within these three years the product will be sold by grading, cleaning and packaging. The following year plan will be extraction of essential oil from Timur and selling to market.

Table 17: Product upgrading of Timur Value Chain based on four parameters.

Parameters	Present	Year 1	Year 2	Year 3
Product	270-300 tons of Timur, mostly traded to India	Timur: Increase 20% by sustainable harvesting & cultivation	Timur Essential oils start up	Timur Essential oils as per resource availability and market
Price (per kg, based on present price)	Rs 70	Rs 80	Timur: Rs 75, Rs 80, Rs 85 for small, medium & large (based on grade) Essential oil: Rs 6500/kg	Timur: Rs 75, Rs 80, Rs 85 for small, medium and large (based on grade) Essential Oil: Rs 6500 / kg
Place	End market Nepalgunj, Krishnagar and KTM	Timur: Majority in KTM	Timur: Majority in KTM Essential oil: Production in project area and market in KTM	Timur: Majority in KTM Essential Oil: Production in project area and market in KTM
Promotion	Good perception of Timur of Rapti	Cleaning and grading	Cleaning, grading, product diversification and initiate national standards process	Cleaning, grading, product diversification and initiate international standards process

Process Upgrading

The process upgrading refers to the upgrading of the whole process from input supply to production, harvesting, post harvesting, essential oil extraction and marketing. The four major processes involved in Timur Value Chain are presented in Figure 8.

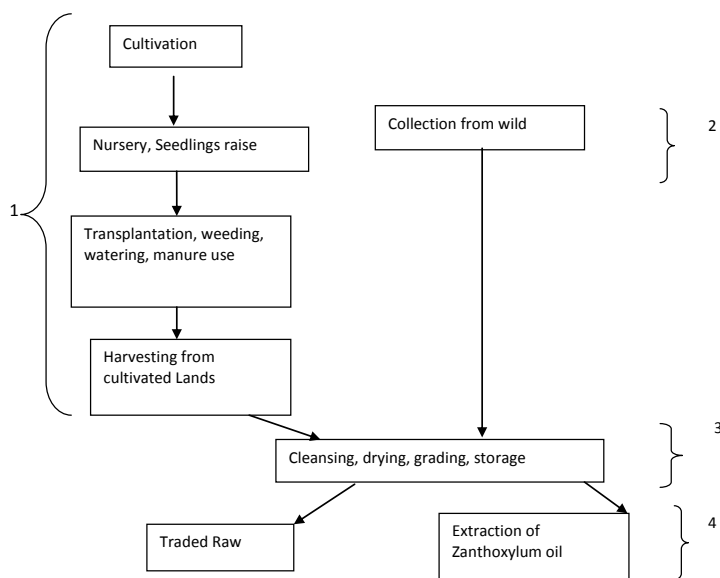


Figure 8: Parameters for process upgrading of Timur Value Chain.

The upgrading strategies required in each step is given in Table 18.

Table 18: Process upgrading matrix of Timur Value Chain

Process Upgrading	Existing practices	Recommended practices	Technical knowledge/ Technology used and cost	Anticipated benefits
Upgrading 1: Cultivation	NA	Cultivation in fallow land and mass cultivation	Existing technology	Mass production and sustainable supply
Upgrading 2: Wild collection	NA	Collection only after seed matures and rotational harvesting system; appropriate low cost methodology for plucking	Resource assessment; leather gloves; staircase	Sustainably managed resource; efficient collection, people friendly
Upgrading 3: Post harvesting	NA	Adequate cleansing, grading and storage	Technical information and knowledge	Quality improvement
Upgrading 4: Extraction of essential oils	NA	Appropriate extraction process	Distillation unit cost (Rs 800,000 for machinery only)	Product diversification; value addition

Channel Upgrading

The market channel of Timur from Rapti area follows three major routes. They are:

- ♦ Product from Rolpa and Pyuthan follows the Chakchake - Bhaluwang route;
- ♦ Product from Rolpa also follows Holeri - Ghorahi - East West Highway route;
- ♦ Product from Rukum follows Shrinagar (Salyan) - Amelia/Ghorahi - East West Highway route;
- ♦ Product from Salyan follows Salli bazar - Surkhet - Kohalpur - Nepalgunj or Salyan - Shrinagar - Amelia/Ghorahi - East West Highway route; and
- ♦ Product from Dang follows Amelia/Ghorahi - East West Highway route.

Once the product reaches East-West Highway, the product is either transported to Nepalgunj (most frequent), Krishnanagar, Bhairahawa or Kathmandu.

The study recommends focusing on:

- ♦ For the first year: Sale Timur seeds to Tulispur, Ghorahi and Kathmandu;
- ♦ For second year: Sale Zanthoxylum oil to extractor based in Kathmandu; and
- ♦ For third year: Sale Zanthoxylum oil to extractor based in Kathmandu.

Functional Upgrading

The major actors in the Timur Value Chain are as follows and their functional upgrading need to be carried out in the following ways.

Table 19: Function upgrading matrix of Timur Value Chain

Actors	Present Function	Upgraded Function
Farmer	Cultivation in fallow and marginal lands	Cultivation in agriculture lands, LFs and CFs
Collector	Wild Collection	Wild collection using sustainable harvesting practice
Village level trader	Buy from collectors and farmers and sell to district level trader	Encourage collectors and farmers to clean Timur and offer slightly higher price for value added product; branding
District level trader	Buy from collectors/farmers and village level traders; storage; sell to regional and national markets (Nepalgunj, Krishnanagar, Kathmandu)	Potential entrepreneur for distillation unit; encourage farmers for Timur cultivation
Wholesaler	Collection of Timur from district level traders and sell to retailers and exporters
Retailer	Sell to consumer

Actors	Present Function	Upgraded Function
Essential oil manufacturer	Manufacture essential oils at regional and national level and sell to exporters or sell themselves	Branding and link with final producer
Exporter	Export Timur and essential oil to India and third countries

Trans-sectoral Upgrading

Till date, Timur cultivation and collection are being practices as a part time income generation and employment generation opportunities by the people. Intercropping practices and trans-sectoral upgrading are not in practice.

Interfirm Upgrading

The interfirm upgrading should be carried out in two ways:

- Formation of alliance among the value chain actors: from cultivators/collectors to wholesaler regarding the pricing of the product according to post harvesting upgrading strategy. This ensures that the Timur that is cleansed, dried and properly stored fetches more price along the value chain. Also, the graded Timur sold according to the grades gets the price accordingly.
- Formation of alliance among cultivators/collectors, distillation enterprises at district and national level essential oils producers so that the product quality and the marketing is assured throughout the value chain.

5.7.3 Business Development and Financial Service Strengthening

The assessment of Business Development Services (BDS) and Financial Services (FS) in this report also considered:

- Categorization of demand side (from beneficiaries' i.e., value chain actors' side into very strong, strong, weak and very weak categories); and
- Categorization of supply side (from BDS providers' side into very strong, strong, weak and very weak categories).

Table 20: BDS and FS Matrix of Timur Value Chain

SUPPLY SIDE OF BDS	Very strong				
	Strong	Access to land for cultivation			
	Weak		Value Chain financing	<ul style="list-style-type: none"> ➤ Entrepreneurship skills ➤ Business Planning 	<ul style="list-style-type: none"> ➤ Market information ➤ Technology - oil processing ➤ Input supply ➤ Technical knowledge
	Very weak				<ul style="list-style-type: none"> ➤ Post harvesting technology ➤ Testing laboratory
		Very weak	Weak	Strong	Very Strong
DEMAND OF SERVICES BY VALUE CHAIN ACTORS					

The commercially viable business development services for fulfilling the above service requirements can be catered by:

Table 21: List of commercially viable business options of Timur Value Chain

Services	Strategy
Inadequate market information	<ul style="list-style-type: none"> ➤ Provision of Market Information System in collaboration with DCCI, JABAN, NEHHPA and ANSAB (via website) ➤ Improve coordination and linkage between village, district and regional level traders ➤ Encourage multipurpose cooperatives to maintain the price list
Low access to market	<ul style="list-style-type: none"> ➤ Enhance coordination between the chain actors, starting from producers to exporters ➤ Institutionalize the existing market
Technology and Product Development	<ul style="list-style-type: none"> ➤ Provision of training and capacity building on nursery management, plantation/production, sustainable harvesting and post-harvest handling for farmers and collectors to meet the conditions of the international buyers ➤ Provision of skill training on quality control and value addition/processing for local traders and processors ➤ Developing innovative technology for cultivation
Inadequate input supplies	<ul style="list-style-type: none"> ➤ Providing healthy seeds and seedlings to farmers ➤ Strengthening and capacitating input suppliers (agro-vets, nurseries)
Inadequate testing facilities	<ul style="list-style-type: none"> ➤ Increase awareness ➤ Capacity building of existing testing facilities at DPR and JABAN ➤ Support testing facilities to upgrade to provide standard testing services

5.7.4 Strategy for Business Enabling Environment:

The specific business enabling environment issues that need to be addressed are:

- ♦ It was reported that more than 95% of Timur are harvested from private and fallow lands. Still, royalty has to be paid for the collected Timur. It is therefore necessary to register the private lands (that are being used for cultivating Timur). At the same time, lobbying to waive the royalty on Timur from private lands is must.
- ♦ Increase participation of poor and disadvantaged household in cultivation of Timur in the lands allocated by CFUGs. Develop mechanism for land allocation in case of CFUGs that are not allocating land at present.
- ♦ Increase investment of VDC for promotion of NTFPs.

5.7.5 Sustainability Strategy

Strategies discussed above have to be sustainable and the most important parameter for sustainability is shared vision. Based on the in-depth discussion with the value chain actors, the study came up with the following strategies that will address the constraints at each level of value chain focusing on increasing income, employment opportunities for poor and investment from private sectors. Sustainability strategies have to be implemented right from the start up of the project intervention. Specific sustainability strategies are:

- ♦ Facilitation for completion of legal procedures for Timur sustainable business operation;
- ♦ Promotion of cultivation practices that will lead to sustainable supply of Timur;
- ♦ Promotion of sustainable harvesting practices for wild Timur;
- ♦ Increasing entrepreneurship skills of value chain actors;
- ♦ Strengthening of the important BDS and FS; and
- ♦ Increasing DDC and VDC investment in NTFPs value chains.

5.8 Achieving the target

The above analysis has resulted in the following envisioning in terms of income and investment opportunities in case of Timur Value Chain.

It was estimated that about 270 to 300 tons of Timur is collected annually in Rapti zone and sold at an average rate of Rs 70 per kg (collector's price). That implies that the Timur worth Rs 21 million is traded annually from Rapti zone. In order to improve the existing Timur Value Chain, RN-MSFP has to intervene at collectors' level by providing local level value addition trainings (cleansing, drying, grading and packaging), thereby increasing the value of at least Rs 10 per kg, that sums up Rs 24 million.

The MSFP programme document says that "decent jobs are those conforming to national minimum labour standards, such as the minimum wage (minimum wage for agriculture labour - Rs 150 per day; minimum wage for enterprise level worker - Rs 150 per day: Source: Nepal Labour Force Survey, 2008). A total of three months (90 days) of jobs is regarded as decent, totalling of Rs 13,500. There are about 7000 to 8000 collectors/farmers who

are involved in collection and trade of Timur. RN-MSFP should target about 10% of the collectors in the initial phase by providing awareness trainings, process upgrading support and linking to the traders (at least village or district level).

Investment in Timur should focus on establishing distillation units. A sum of Rs 800,000 is required to establish a distillation unit (excluding pre operating cost and working capital). The distillation unit employs two staffs (one unit operator and one helper) on a monthly basis. Distillation unit is generally run for six months in a year. A distillation unit can process upto 300 kg of Timur in a day. Establishing one or two distillation units with the involvement of private sectors will add more investment.

5.9 Interventions

Above strategies can provide following immediate and short term interventions in a nutshell.

5.9.1 Immediate

As an immediate action, RN-MSFP have to establish linkage with the district level traders and the essential oil processors, who are willing to pay more price for Timur (one of the essential oil processors offered Rs 300/kg for dried seedless Timur), thereby ensuring that the collectors also get the share the increased amount.

5.9.2 Short term

- ♦ Train lead farmers for Timur cultivation in larger areas (fallow lands)
 - ❖ Identify key influential farmers that are cultivating Timur and other medicinal plants; and
 - ❖ Motivate the lead farmers to cultivate Timur.

RISK FACTOR AND MITIGATION STRATEGY: Timur is a perennial crop and farmers with low income finds it hard to do mass cultivation as Timur takes at least three years to mature. In this context, either an organized business house have to commence mass cultivation or a group of farmers should be encouraged to cultivate Timur in CFs, LFs or fallow lands.

- ♦ **Exposure Visits**
 - ❖ Exposure visits to the lead farmers to successful Timur cultivation sites; and
 - ❖ Exposure visits to inform them about the extraction process of *Zanthoxylum* oil.
- ♦ **Delegation of collection rights to women and disadvantaged group members**
 - ❖ Priority of collection should be given to the women and disadvantaged groups who have least income generating opportunities

RISK FACTOR: It was observed that Executive Committees of the most of the CFs are dominated male members. In this situation, poor women find it difficult to raise their voice for collection rights.

- ♦ **Access to finance through existing cooperatives and financial institutions**
 - ❖ Farmers often find it difficult to manage the fund for cultivating long term crops like Timur, which takes at least three years to mature. Efforts should be made to identify the cooperatives and the financial institutions that are willing to provide both long and short term loans to the farmers; and
 - ❖ CFUGs and NGOs can act as a witness to encourage cooperatives and financial institutions to provide loan to landless and poor farmers.
- ♦ **Improved technology to harvest the fruits**
 - ❖ Collection of Timur is a difficult and time consuming task. Locally adapted innovative technologies (locally made leather gloves, small wooden staircase to collect Timur) have to be developed for harvesting of Timur.
- ♦ **Training on processing (extraction of Zanthoxylum oil)**
 - ❖ Essential oil processing involves a simple distillation technology. Nevertheless, the technology has to be owned by the farmers. Therefore, on the field training on processing of Timur is must.
- ♦ **Policy lobbying**
 - ❖ It was reported that more than 95% of Timur are harvested from private and fallow lands. Still, royalty has to be paid for the collected Timur. It is therefore necessary to register the private lands (that are being used for cultivating Timur). At the same time, lobbying to waive the royalty on Timur from private lands is must.

SECTION SIX: VALUE CHAIN ANALYSIS OF ALLO

6.1 Introduction of Allo

Allo (**Botanical name** - *Girardinia diversifolia*; **English name** - Nettle, Himalayan Nettle, Stinging Nettle; **Local Name** - Pua) is a perennial shrub that belongs to Urticaceae family. The stem bark of Allo contains fibres with unique strength, smoothness and silk like lustre. The fibre is used to make clothes since time immemorial. Allo fibre, thread and weaved clothes are commercially traded from few (Rolpa, Rukum, Dadeldhura, Sankhuwasabha, Myagdi, Baitadi, Parbat, etc.) districts of Nepal.

6.1.1 Habit (characteristics)

Allo is a robust shrub reaching up to a height of 2m or more. Leaves are stalked, alternate, dentate, palmately divided with three distinct nerves running to three lobes. Size of mature leaf measures 10 - 24 cm by 7 - 18 cm. Leaf blade and stalk contains long awl-shaped bristles and stinging hairs. Flowers are sessile and borne on axillary and terminal branched spikes. Female spikes may reach up to 40 cm long whereas male spike short but much branched (Polunin and Stainton, 1984, Manandhar, 2002). Flowers are green to yellowish green in colour, flowering occurs in July-August and fruiting from September to early November. Allo propagates by seeds, root offshoots (new plant arising from root of old plant) and root suckers (Pyakurel and Baniya, 2011).



Picture 2: Allo in wild habitat (left) and Thread (middle) and Coat made from Allo (right). Pictures by D. Pyakurel

6.1.2 Habitat and distribution

Allo shows wide distribution on the southern belt of the Himalayas. It is distributed throughout Nepal at altitudes between 1200 – 3000 masl in moist areas, forest areas with shade or semi shade, along the gorges, streams and tributaries and on the edge of the cultivated land. The plant prefers light (sandy), medium (loamy) and heavy (clay) soils. The plant prefers acid, neutral and basic soils (Pyakurel and Baniya, 2011). Traders prefer Allo from Dadeldhura, Baitadi, Bajhang, Bajura and Doti as they are long and yields good fibre.

Allo is found in forests with Uttis (*Alnus nepalensis*), Guras (*Rhododendron arboreum*), Okhar (*Juglans regia*), Malo (*Viburnum mullaha*), Khasru/Banjh (*Quercus sp.*), Kafal (*Myrica esculenta*), Lauth salla (*Taxus wallichiana*), Pangra (*Aesculus indica*), Sugandhakokila (*Cinnamomum glaucescens*), etc. as major tree components. The associated shrub species of Allo are Dhatelo (*Princepia utilis*), Lokta (*Daphne sp.*), Argeli (*Edgeworthia gardneri*), Nigalo (*Drepanostachyum falcatum*), Ban Silam (*Elsholtzia sp.*), etc.

6.1.3 Uses of Allo

Residents of hilly areas and ethnic groups have for centuries extracted and spun Allo fibres to weave durable jackets, porter's head bands or straps, fishing nets, ropes, bags, mats, coarse clothing material, blanket, etc. in the remote villages of Nepal. The specialty of Allo is its strength and durability. It is often lighter and more delicate-looking than its wild contemporaries, jute and hemp.

At community level, harvesting, weaving and trade of nettle by the indigenous communities is helpful in meeting the basic requirements of their communities. Different manufacturing company either purchase coarse fibre or weaved clothes to produce a variety of attractive, practical and durable bags, packaging material and clothes and are sold in Nepal and international markets.

6.2 Supply chain of Allo

The trading of Allo starts with collection of bark from forests and ends with export. Allo thread or weaved clothes are mostly brought to Ghorahi, Tulsipur (Dang) and then to Kathmandu and sold to entrepreneurs or exporters. Entrepreneurs also purchase Allo bark from other districts (far western districts) and operate from Ghorahi and Tulsipur. The entrepreneurs often weave fine clothes from thread in Kathmandu and sold to domestic market and export. That is value addition takes place both in urban as well as rural areas. Income is shared by both rural communities and urban entrepreneurs. Promotion of quality yarn and cloth production has great potential to alleviate rural poverty in the hilly areas of Rapti zone. A simplified supply chain of Allo thread and cloth is given in Figure 9.

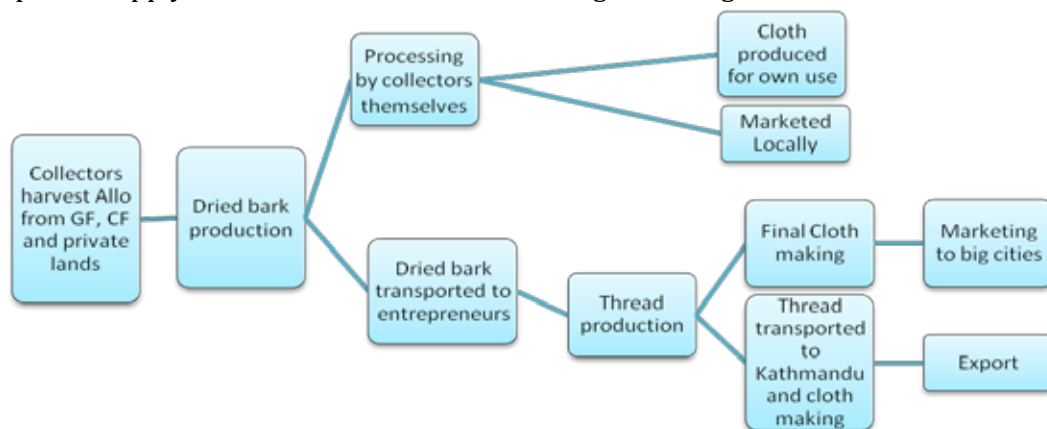


Figure 9: Supply Chain of Allo thread and cloth (Size of box does not represent the volume).

6.3 Value chain map of Allo

Figure 10 presents the value chain map of Allo in the Rapti area. The map shows the roles and functions of the actors, their relationships and functions of the enablers. The functions of the actors are given in the left hand side and areas of intervention of the enablers are given in the right hand side.

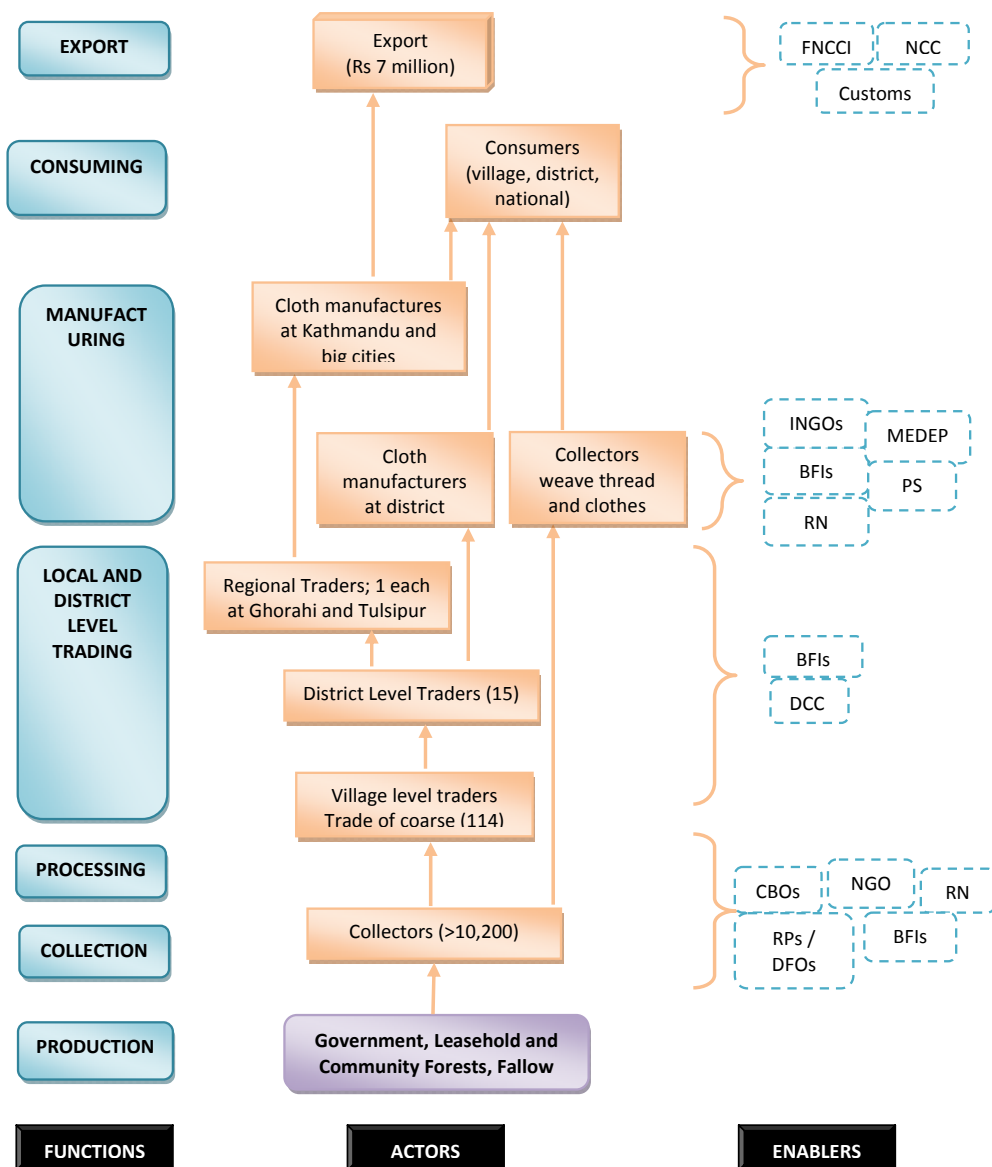


Figure 10: Value Chain Map of Allo harvested from Rapti area.

6.3.1 Roles and functions of the actors and their relationship

Actors involved in Allo value chain can be categorized into different types according to their functions along the chain. They are collectors, village level traders, district level traders, regional traders, exporters, processors (often collectors themselves who process the dried bark to make coarse fibre), retailers and consumers.

Collectors: More than 10,200 households (FGDs, data collected by RN study team) are engaged in collection of Allo in the four (Rukum, Rolpa, Salyan and Pyuthan) districts of Rapti area. Allo is not widely distributed in Dang because the climate does not support the natural distribution. Most of the collectors are women and members of disadvantaged groups (poor, ethnic minorities, Dalits, etc.) who have little access to finance. The collectors harvest Allo from GFs and CFs. Most of the women collectors are primary processors themselves. They collect the Allo, remove bark from the stem and either sun-dry or smoke dry and make the fibre from the bark. Thus, collectors and primary processors are same for Allo in most of the cases. Collectors either sell the fibre to village/district level traders or manufacture the clothes for own use or sell to local market. Their products find it hard to compete with the products manufactured by manufacturers of big cities because of the quality of spun thread.

The estimated collection/production of Allo from Rapti area is around 150 tons dried bark (Source: FGDs, DFOs report, one to one consultation with traders, etc). Out of the 150 tons, most are consumed within the production district to produce fibre and thread. District level traders in most of the cases export weaved thread to regional level traders.

Village Level Traders: Village level traders purchase dried bark and/or fibre from collectors and sell to district level traders. There are approximately 114 village level traders in five districts (FGDs, data collected by the study team). Most of village level traders have their own retail shop of food items, grocery items, clothes and hardware (as evident in Holeri-Ropa and Sulichaur-Rolpa) thus collectors sell Allo and buy the necessary materials from them. Bulk of the local production is collected by them whereas some are purchased directly by the agents of district level traders.

District Level Traders: District level traders, who are thread producers in most of the cases, purchase Allo bark in bulk and manufacture thread in the factories, which are mostly situated in and around the district headquarters. There are approximately 15 district level traders in five districts who are trading thread, fibres and sometimes dried bark.

Manufacturers at District: Different INGOs, NGOs, bilateral aid agencies, MEDEP, DCSI/CSIDB are regularly providing Allo processing training to women residing in rural areas (for example, CSIDB provided one month training to women of Arkha, Pyuthan in April 2012). Their products are mostly sold at village or at the district headquarter. However, manufacturers at Kathmandu prefer to buy coarse fibres as they weave the thread from their modern machine (trader at Budhanilkantha, Kathmandu has a modern machine to weave fine Allo thread), which are finer than the ones weaved by hand (as shown in Picture 3). Manufacturers at Kathmandu weave fine cloth and make different items such as coat, shawl, diary cover, bags, purses, etc. and sell them to the retail market.



Picture 3: Collector/ processor weaving thread from Allo fibre at Hwama, Rolpa- Picture by D. Pyakurel

Regional Level Traders: The regional traders purchase Allo thread (sometimes they purchase dried bark and fibre also) mostly from district level traders and sell mostly to manufacturers at Kathmandu. There are total of two regional traders, situated one each at Ghorahi and Tulsipur. Other regional traders are stationed at Kathmandu who purchase thread from district traders and sell to the manufactures at Kathmandu.

Exporters/Producers: Manufacturers at Kathmandu manufacture different products and either sell them at domestic market or to the exporters. Exporters purchase quality products and export to third countries. Allo clothes worth Rs 7 million was exported from Nepal in FY 2012/013.

6.3.2 Enablers

Enablers of “Allo value chain” are those who work for the value chain actors and provide facilitating and regulating supports. Activities of enablers ranged from collection to end use including technology, product development, advocacy for simplifying trade policy and procedures, organizing groups and networks for reinforcement and market information and linkages for better access. Regulating agencies are also working as a facilitator in many cases (HVAP, 2011). The major facilitating organizations and regulating agencies and their activities are given in Table 22.

Table 22: List of enablers and facilitating organizations in Allo Value Chain

Major Activities	Facilitating Organizations	Regulating Organizations
Sustainable cultivation	CFUGs, RN-MSFP	DFO,
Collection permit	CFUGs	DFO, CFUGs, LFUGs
Harvesting		DFO, CFUGs, LFUGs
Post harvesting activities (drying bark, weaving thread)	MEDEP, CSIDB, DCSI	CSIDB, DCSI
Royalty Exemption	CFUGs, LFUGs, I/NGOs	DFO, DoF
Transport/ Export permit		DFO
Local Taxes		DDC, VDC
Manufacturing at big cities	FNCCI, commodity associations, traders association	CRO, MoICS
Market Information	ANSAB, MSFP-RN, AEC	
Resource Management	CFUGs	DFO, DPRO

Enablers during collection: Allo is widely distributed in the forests of Rapti zone therefore no cultivation practice has been started in the area (and throughout Nepal). Allo is a wild spreading plant therefore it covers wider space in short span of time. Due to these reasons, sustainability of Allo is not a major concern till date. But after commercial level collection, there are chances of over harvesting from wild. NGOs, CBOs, C/LFUGs and District Forest Office have to play both facilitating and regulating role for resource management. CFUGs and LFUGs provide collection permit for locally managed forestry regimes and DFO issues collection permit for resources collected from government forests.

Enablers during processing functions: Local processing is mostly carried out by collectors themselves. NGOs, DCSI/CSIDB, MEDEP, RN-MSFP are providing trainings to manufacture quality threads and clothes. NGOs and MEDEP acts as facilitators and DCSI and CSIDB act as both facilitators and regulators.

Enablers in Trading and Export Functions: DFO issues transport permit for traders to export bark outside the district. Business Membership Organisations (BMOs) like Jadibuti Association of Nepal (JABAN), Nepal Herbs and Herbal Products Association (NEHHPA), commodity associations, District Chamber of Commerce and Industries (DCCI) support traders for export.

Agro Enterprise Centre (AEC) is working in the area of market development by providing market information, facilitation for market linkages, etc. Similarly, Trade and Export Promotion Centre (TEPC) assist in export of goods and maintain the export data.

Ministry of Forest and Soil Conservation (MoFSC), Department of Forest (DoF), Department of Plant Resources (DPR), Ministry of Commerce and Supplies (MoCS) and Federation of Nepalese Chambers of Commerce and Industry (FNCCI) are business enablers at higher levels and they facilitate business through policy lobbying, policy formulation and bilateral trade agreements.

6.4 Economic analysis of Allo bark and fibre

Yields of dried fibre are around 600kg per hectare (Pyakurel and Baniya, 2011). Plant fibre is extracted in commercial scale in most of the hilly districts (Dadeldhura, Baitadi, Bajhang, Bajura, Doti, Rolpa, Pyuthan, Rukum, Baglung and Sankhuwasabha) of Nepal. Allo is traded either in raw (dry bark) or semi processed (coarse fibre) or processed (cloth) form. Dried bark is traded approximately at Rs 90/kg (collectors price), coarse fibre is traded at Rs 450-500/kg, thread is traded between Rs 800 - 900 per kg (as per the quality) and handmade cloth is traded at Rs 1,000 - 1,200/meter.

Being a seasonal plant, collection of Allo bark is carried out for about two months (60 days) only. A collector can collect about 25 kg of fresh bark per day (from 100 kg green plant) but the quantity of harvest depends upon the availability of the resource in the wild. The quantity is generally reduced to one fifth after sun drying therefore 5 kg of dried bark is collected per day, meaning that the maximum amount that can be collected by an individual per year (within a period of 60 days) is about 300 kg. Thus in an average, if a collector harvests Allo bark throughout the season (60 days) and sell at the rate of Rs 90 per kg, then s/he may earn Rs 27,000 for two months (per day=Rs 450; per month=Rs 13,500).

One person day is required to process 3.75 kg of bark to produce 1.5 kg of fibre. This includes soaking in water, cooking with caustic soda or ash, washing, beating, drying and cleaning. If a person involves him/herself for 8 months (240 days) in fibre making, s/he can produce 360 kg fibre in a season. About 900 kg of dried bark is required to manufacture 360 kg of fibre and deducting the cost of bark, Rs 99,000 can be earned in a season at the present rate of Rs 500/kg (per day= Rs 410; per month= Rs 12,375).

About 2 person days are required to produce 1 kg of thread from fibre. If a person involves him/herself for 8 months in thread making, s/he can produce 120 kg thread in a season. The thread is traded at an average of Rs 850/kg thus total sales would be Rs 102,000. About 150 kg of fibre is needed to produce 120 kg thread. Thus deducting the cost of fibre (Rs 75,000 for 150 kg of fibre), only Rs 27,000 can be earned in a season (per day Rs 112.5). Knitting the Allo thread is therefore not an economically viable option at the village and it is recommended for village level processors to sell the coarse fibre rather than selling the yarn or threads.

To minimize the loss, traders at districts give the part time employment to women that belong to poor households. They spun the thread from fibre at their leisure time and earn some money. For instance, a trader at Ghorahi has engaged more than 1,000 women for weaving thread. They are earning Rs 150 for 1 kg thread. In this way, the enterprise will

not have to pay regularly for them (as other staffs) and on the other hand, the women are earning some money.

About 3 meters of cloth can be weaved from 1 kg of Allo thread. One person can weave about 2 meters of such cloth per day. If a person works for 8 months, s/he can weave about 480 meter of cloth, requiring 160 kg of Allo thread. The cost of production (excluding the fixed costs) would be around Rs 136,000 and selling price would be Rs 480,000, a total profit of Rs 344,000 for period of eight months (Rs 1430 per day).

The basis of calculation was adopted from ANSAB report 2010, Pyakurel and Baniya 2011 and information generated from the field visits and consultation with the manufacturers. Details of other calculations are given in Annex 6.

6.5 Supply and demand

6.5.1 Production/supply

National Perspective: The national production of Allo thread is around 1,805 tons per year (MEDEP 2010). Half of the production is consumed within Nepal whereas half are exported. The demand of Allo weaved clothes is high in international market and it is a prime souvenir product of Nepal.

Rapti Specific: The total productivity of Allo bark from Rapti area is estimated to be 150 tons. Most of the produced barks are consumed within the Rapti area to manufacture fibre and thread. There are more than seven registered Allo knitting industries in Rapti area.

6.5.2 End Market/demand

Kathmandu is regarded as end market for commercial Allo producers. Allo threads produced from Rapti area are transported to Kathmandu. The rough thread is used to make carpets whereas fine thread is used to make clothes. The carpets are mostly exported whereas Allo weaved clothes are either consumed in domestic market, or sold at tourist centres or are exported. As mentioned earlier, the total export value of Allo products was Rs 7 million in FY 2012/013.

6.6 SWOT analysis of Allo

Table 23: SWOT analysis of Allo Value Chain

Strength	Weakness
<ul style="list-style-type: none"> ➤ Dried barks, coarse fibres, threads and clothes all have market ➤ Good demand in national and international market ➤ Market of local products exists in local level ➤ Good attraction amongst tourists as souvenir product ➤ Found abundantly in forests ➤ Rare infestation of diseases and pests 	<ul style="list-style-type: none"> ➤ Market of Allo thread is low compared to that of coarse fibre despite thread making needs more effort ➤ The production of Allo fibre at local level is not cost effective ➤ Existing technologies are simple but time consuming and tedious, need improved technology to process fibre from dried bark
<ul style="list-style-type: none"> ➤ Favorable geo-climatic condition and possibility of natural generation ➤ Immediate cash flow for poor from Allo based enterprises 	<ul style="list-style-type: none"> ➤ Inadequate quality control: inconsistent quality of threads that finds hard to meet the international demand, rural products are finding hard to compete with products from big cities
Opportunity	Threat
<ul style="list-style-type: none"> ➤ Possibility of high value addition within the country ➤ Increasing usage of Allo in carpet industries ➤ Interest of various organizations in Allo promotion ➤ Income generation opportunities for women ➤ New technologies for Allo processing are being researched by various organizations ➤ Plenty of scope to manufacture high quality products (finer threads) 	<ul style="list-style-type: none"> ➤ Allo based enterprises are forfeiting Allo based work due to tedious work ➤ Dependent on import of chemical (dyes) from India ➤ Might lead to deforestation due to increased demand for fuel wood to process Allo ➤ Uses of Caustic Soda

The market based solutions to the identified weaknesses and threats to tap the existing opportunities are provided as BDS strategy in the next section as a part of Value Chain Upgrading Strategy.

6.7 Value chain upgrading strategy

The value chain upgrading strategies for Allo are presented considering the six parameters as given in Table 3. These strategies are expected to provide in-depth information to the project to develop action plan for each of the strategy for value chain upgrading in coming days. The strategies for upgrading Allo value chain are presented as:

6.7.1 End Market Strategy

End market strategy is prepared to fulfil the gap between market requirements and present status. Spiderogram is used to present the end market strategy. In case of Allo, seven parameters were used to prepare spiderogram (Figure 11).

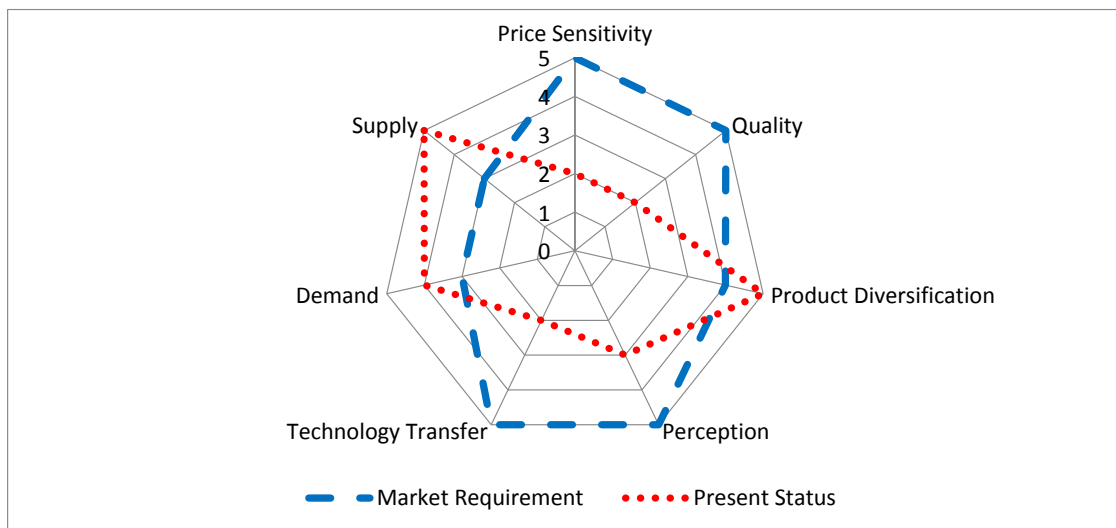


Figure 11: Spiderogram showing the gap between market requirements and present status of Allo Value Chain.

The score ranging from 1 - 5 was given based on the parameters given in the Table 24.

Table 24: Parameters used for preparation of the end market strategy of Allo Value Chain

Parameters	1	2	3	4	5
Price Sensitivity	Worst price negotiation between buyers and sellers	Weak price negotiation between buyers and sellers	Moderate price negotiation between buyers and sellers	Good price negotiation between buyers and sellers	Best price negotiation between buyers and sellers

Parameters	1	2	3	4	5
Quality	Inferior	Low	Moderate	Good	Excellent
Product diversification	Single product line	More than two product lines with unequal volume	More than one product lines with equal volume	More than one product lines with equal volume and grade product	More than one product lines with equal volume, grade product, minimization of wastage
Perception	Inferior	Low	Moderate	Good	Excellent
Technology transfer	Traditional technology	Appropriate technology used in one process (production/processing/product development)	Appropriate technology used in more than one processes	Technology used in all the processes and meeting national quality demand	Technology used in all the processes and meeting international quality demand
Demand	Low demand	Limited demand	Moderate demand	Good demand	Mass demand
Supply	Low supply	Limited supply	Moderate supply	Good supply	Mass supply

The major gaps in the market have been identified as:

- Quality Allo products are being sold at better price in the end markets but the collectors and processors are not getting the optimum price.
- Consumers' perception back lashed by quality of cloth.
- Limitation in technology transfer is hindering the quality of Allo thread and in turn that of Allo clothes. Lack of appropriate technology was observed in:

Fibre making: Still traditional fibre making is being practiced in most parts of Nepal.

Thread making: Traditional thread making is being practiced at local level, charkha at few places, electric charkha recently introduced in some parts of Nepal. Some enterprises are getting the thread made from spinning industries.

Cloth making: Taan (traditional handloom) is being used for making Allo cloth although advanced technology like power loom is available in Nepalese market.

Product making: Various technologies are being used to make specific products such as bags, wallets, etc. by mixing with other materials.

This implies that, at present, the focus has to be on appropriate technology for making fibre and thread.

- d. Discussion with the exporters has revealed that there is growing demand of Allo products e.g. Allo used carpets, Allo shoes, Allo shawls, etc. at international market. However, business to business linkages are found more interested in Allo fibre and Allo thread. Thus, the study team has concluded that there is limited scope for product diversification at local and district level.

6.7.2 Firm Level upgrading

Product upgrading

Scanning through the experiences of various organizations and in-depth discussions with the exporters have identified Allo thread as the most important product in Allo value chain. Therefore, focus has to be on enhancing the brand image of Rapti zone as a supplier of the quality Allo thread. For this, use of appropriate technologies for thread making has to be ensured in the area. Currently, there are two options available for ensuring the quality thread making: (1) appropriate technology transfer for thread making at local level and (2) outsourcing thread making to the spinning industries.

Table 25: Product upgrading of Allo Value Chain based on four parameters

Parameters	Present	Year 1	Year 2	Year 3
Product	Allo bark - 150 tons; Allo fibre - 60 tons; Allo thread - 50 tons	Focus on Allo fibre and thread making using appropriate technologies	Allo thread making outsourced to the spinning industries and thread sold to the exporters; Local made Allo thread sold to local and district level enterprises	Develop institutional mechanism for profit sharing between collectors, fibre makers and thread businesses
Price (based on present price)	Allo bark: Rs 80 -90; Allo fibre: Rs 500; Allo thread: Rs 800 - 900	Allo fibre: Rs 600 (decrease in production cost by 20%); Allo thread: Rs 900 -1000 medium quality	Allo Fibre: Rs 600 (decrease in production cost by 20%); All thread: Rs 1000+ per kg for high quality thread	Allo Fibre: Rs 600 (decrease in production cost by 20%); All thread: Rs 1000+ per kg for high quality thread

Parameters	Present	Year 1	Year 2	Year 3
Place	End market: District; Dang	Allo fibre: District and Dang; Allo thread: Dang and Kathmandu	Allo thread: Exporters in Kathmandu	Allo thread: Exporters in Kathmandu
Promotion	Poor reputation of present fibre and thread	Quality fibre and medium quality thread production	Quality fibre making and high quality thread making by outsourcing to the spinning industries	Quality fibre making and high quality thread making by outsourcing to the spinning industries

Process upgrading

Process upgrading refers to the whole process from collection to fibre making, thread making, cloth making and product development.

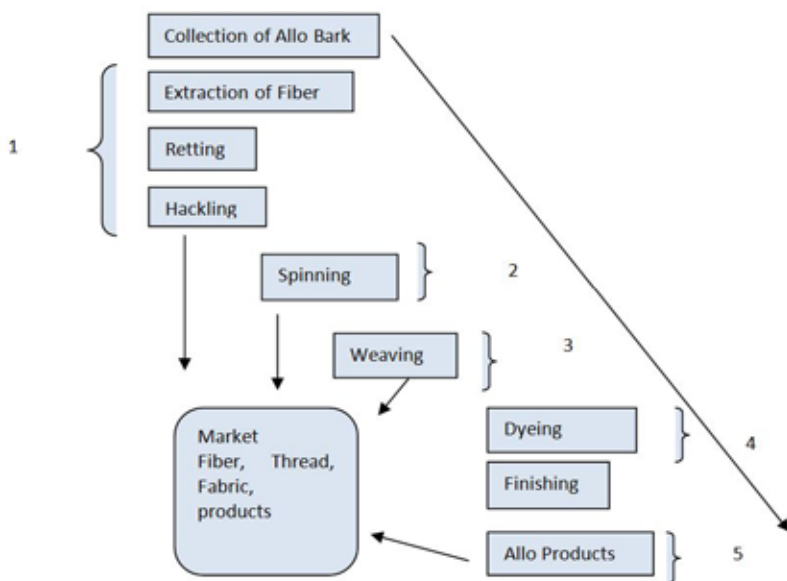


Figure 12: Major steps involved in Allo Value Chain (from collection to marketing of Allo).

Figure 12 shows that there are five major steps in Allo Value Chain. The upgrading required in each step is given in Table 26.

Table 26: Process upgrading matrix of Allo Value Chain

Process Upgrading	Existing practices	Recommended practices	Technical knowledge/ Technology used and cost	Anticipated benefits
Upgrading 1: Allo fibre making	At present traditional process is being used	Improved technology is being used in Sankhuwasabha for Allo fibre extraction	Rs 25,000 - 30,000 (information being sought from Sankhuwasabha)	Reduction in production cost
Upgrading 2: Thread making	<u>Process 1:</u> Traditional process <u>Process 2:</u> Charkha	Electric charkha; Outsourcing to spinning industries	Electric charkha: Rs 8,000 - 10,000	Increased quality
Upgrading 3: Weaving	Usage of <i>Taan</i>	Improved <i>Taan</i> ; Usage of power loom	<i>Taan</i> : Rs 10,000 - 15,000	Increased quality; increased efficiency
Upgrading 4: Dyeing	NA	Usage of natural dye like Majitho, Turmeric, Padamchal, Chutro, etc.	Composition of more natural dye yielding plants	Natural colour; premium prices
Upgrading 5: Product making	<i>Kurush</i> (weaving needle); Tailoring machine	Should focus on improving the quality of thread instead on focusing on product making in these three years		

Channel upgrading

The market channel of Allo differs a little bit from other forest based products that are traded in raw form. As mentioned earlier, Allo thread and cloth are exported outside the Rapti area. Allo cloths are also consumed within the Rapti area, but mostly through souvenir shops. Allo thread and cloth from:

- ♦ Rolpa and Pyuthan follows Chakchake - Bhaluwang route;
- ♦ Rolpa (Holeri region) also follows Holeri - Ghorahi - East West Highway;
- ♦ Rukum follows Srinagar (Salyan) - Amelia or Ghorahi - East West Highway;
- ♦ Salyan follows Salli bazar - Surkhet - Kohalpur - Nepalgunj or Salyan - Srinagar - Amelia or Ghorahi - East West Highway route; and
- ♦ Dang follows either Amelia or Ghorahi route and finally to East West Highway.

Once the product reaches East West Highway, the products are mostly transported to Kathmandu. From Kathmandu, it is either exported or sold at domestic market through distributors, wholesalers retailers, etc. The study recommends to sell Allo fibre to local market (district) and Dang in first year and Allo thread to local market, Dang and export market to Kathmandu.

Functional upgrading

The major actors in the Allo Value Chain are as follows and their functional upgrading should be carried out in following ways.

Table 27: Function upgrading matrix for actors of Allo Value Chain

Actors	Present Function	Upgraded Function
Collector	Collection from the wild	Wild collection can be carried out by poor people
Fibre producer	Uses conventional method to extract fibre from bark	Fibre production can be based at VDC level with employment generated for poor people; use of chemical instead of ash; proper management of waste water
Village level trader	Buys from collectors and farmers and sells to district level traders	Encourage to differentiate fibre made from traditional system from those made using appropriate technologies and fetch different price for both
District level trader	Obtains collection permit from DFO; asks village level traders to collect Allo barks; sells them to entrepreneurs	NA
District level fibre and thread makers	Small scale thread producers are also found in village level, but the district level entrepreneurs deal with high volume of Allo bark and has own set ups for fibre and thread making	NA
Cooperative	NA	Buys from collectors and farmers, produces Allo thread and sells them to Pokhara and Kathmandu market
Spinning industries	Most industries involve poor women in spinning thread from fibre (conventional method)	Use of modern spinning machine (electric <i>charkha</i>); Cloth making by modern machine to manufacture fine products

Actors	Present Function	Upgraded Function
Exporter	Exporting fine Allo products	Exporters are interested in thread and make various products like carpet, Allo shawls, etc. at Kathmandu level

Trans-sectoral upgrading

Mostly woman groups are mobilized for Allo collection from the forests. These woman groups can also be employed for the collection of other NTFPs like Chiraito, Timur, etc.

Interfirm upgrading

The interfirm upgrading has to be carried out in two ways:

- Formation of alliance among enterprises involved in fibre making and thread making and spinning industries at regional level; and
- Formation of alliance between fibre making and thread making enterprises.

6.7.3 Business development and financial service strengthening

The assessment of Business Development Services (BDS) and Financial Services (FS) in this report also considered:

- Categorization of demand side (from beneficiaries' i.e., value chain actors' side into very strong, strong, weak and very weak categories); and
- Categorization of supply side (from BDS providers' side into very strong, strong, weak and very weak categories).

Table 28: BDS and FS strengthening matrix for Allo Value Chain

SUPPLY SIDE OF BDS	Very strong				
	Strong	Cultivation of Allo			
	Weak		Value Chain Financing	Entrepreneurship skills	Market requirement about quality and price, Group formation
	Very weak	Sustainable business practices of Allo processing			Appropriate Technology Transfer; Cost benefit analysis
		Very weak	Weak	Strong	Very Strong
		DEMAND OF SERVICES BY VALUE CHAIN ACTORS			

The commercially viable business development services for fulfilling the above service requirements can be catered by:

Table 29: List of commercially viable business options for Allo Value Chain

Services	Strategy
Inadequate market information	<ul style="list-style-type: none"> ➤ Provision of market information through Saugat Griha Pvt. Ltd., SABAH Nepal and Fair Trade Group organizations ➤ Coordination and linkage between village, district and regional level traders ➤ Enhanced use of multipurpose cooperatives to maintain the price list
Low access to market	<ul style="list-style-type: none"> ➤ Alliance build up with Koseli Ghar, Saugat Griha, SABAH Nepal and Fair Trade Group Nepal
Technology and product development	<ul style="list-style-type: none"> ➤ Technology transfer for Allo fibre processing from Sankhu-wasabha ➤ Technology transfer for Allo thread making from SABAH Nepal ➤ Linkages between Allo fibre and thread
Entrepreneurship skills, business planning and cost benefit analysis	<ul style="list-style-type: none"> ➤ Provision of entrepreneurship skills, business planning through BDS POs and CSIDB/DCSI
Value Chain financing	<ul style="list-style-type: none"> ➤ Provision of loan and subsidy for technology transfer

6.7.4 Strategy for business enabling environment:

The specific business enabling environment issues that need to be addressed are:

- ♦ Allo is a major product in the region and DDCs have to contribute administratively and financially to promote technology transfer for Allo promotion;
- ♦ Sustainable Allo business requires environmental issues to be considered while processing of Allo fibre and policy on sustainable processing practices has to be encouraged by stakeholders;
- ♦ Allo is an exportable product and local government should improve the mechanisms for collection, transportation and processing as, at present, there are some hindrances like: multiple taxations, lengthy procedures for collection permit, etc. in the region;
- ♦ Increase participation of poor and disadvantaged households in the cultivation of Allo in the land allocated by CFUGs and encourage CFUGs to allocate to poor and disadvantaged households in case of CFUGs that are not allocating land, at present; and
- ♦ Increase VDC investment for promotion of NTFPs.

6.7.5 Sustainability strategy

Various organizations all over Nepal are working for Allo promotion. They are focusing on product diversification at local level. This has resulted into varieties of Allo products in the local market. However, those diversified products are in no position to cater the demand of local/district markets because of high production cost and quality issues. On the other hand, they are finding hard to establish business to business linkage due to higher transaction cost. For Allo Value Chain to be sustainable in the region, it is crucial to set brand as “Quality Allo Fibre and Thread Producer”. This will increase income of the communities at local level who are producing Allo fibre and that of the enterprises at district level that are investing/willing to invest in the appropriate technologies at district level. Thus, the sustainability of the Allo Value Chain in Rapti zone can be ensured by focusing on producing high quality Allo fibre and Allo thread to cater the demands of local, regional and national markets.

6.8 Achieving the target

The above analysis has resulted in the following envisioning in terms of income and investment opportunities in case of Allo Value Chain.

A total of 150 tons of Allo bark was collected from Rapti area in FY 2012/013 that provided employment to about 500 collectors.

One person can make 1.5 kg of coarse fibre in a day. Thus, it is evident that it will require ample manpower to manufacture 60 tons of fibre (made from 150 tons of dried bark). RN-MSFP should focus on introducing appropriate technology to make fibre from bark so that the current expenses (during fibre making) are minimized and subsequently more income will be generated from this sector.

The average rate of Allo thread was Rs 850 per kg that sums up Rs 42.5 million. RN-MSFP has to intervene at processors level by transferring appropriate technology for fibre making, thereby decreasing the production cost (inclusive of time) by 20 %.

6.9 Interventions

Above strategies can provide following immediate and short term interventions in a nutshell.

6.9.1 Immediate

- ♦ Collectors have started collecting Allo therefore in the first phase, RN-MSFP should search for appropriate cooking/digesting technology so that the effort during fibre making is minimized, thereby reducing the cost of production.
- ♦ Afterwards, RN-MSFP should establish linkage between fibre processors, thread makers and cloth manufacturers to fetch optimum price for the fibre and thread. The thread makers of Rapti area have to still rely on brokers at Kathmandu to sell the thread. RN-MSFP will establish direct linkage between thread makers and cloth makers (at Kathmandu).

6.9.2 Short term and long term

- ♦ Build business to business partnership with Fair Trade Organizations, SABAH Nepal and Carpet industries
 - ❖ Memorandum of understanding between export businesses and enterprises in district for delivery of Allo thread.
 - ❖ Seek embedded services provided by export businesses like market information, quality control, technology transfer, etc.
- ♦ Organize participatory market chain workshop involving collectors, Allo fibre producers, Allo thread producers, business organizations (with whom MoU is done), CSIDB/ DCSI, MEDEP, etc.
- ♦ Technology transfer for Allo fibre processing and Allo thread making
 - ❖ Making improved and efficient Allo fibre and thread making technologies available at local level
- ♦ Formation and/or capacity development of Allo network at district level to act as marketing units (eg. Allo Club in Sankhuwasabha)
- ♦ Alliance building of the enterprises in district with the spinning industries for quality thread making.

SECTION SEVEN: VALUE CHAIN ANALYSIS OF CHIURI

7.1 Introduction of Chiuri

Chiuri tree (**Botanical name** - *Diploknema butyracea* (Roxb.) H. J. Lam; **Synonyms** - *Bassia butyracea* Roxb., *Madhuca butyracea* (Roxb.) Macbride, *Aesandra butyracea* (Roxb.) Baehmi, *Illipe butyracea* (Roxb.) Engler; **English name** - Butter tree; **Family**: Sapotaceae) is a medium sized tree native to the foothills of Nepal. The main product of the tree is ghee or butter, extracted from the seeds and popularly known as “Chiuri ghee”. Chiuri is a promising species and should be promoted as a source of livelihood improvement for the people of Rapti zone.

7.1.1 Habit (characteristics)

Chiuri is a deciduous tree that reaches up to 22m. Leaves are stalked, oblong, entire, acuminate, hairy beneath and glabrous above and are generally crowded near the end of branches. Flowers are stalked, white to yellowish white and crowded at the end of the branches. Fruits are berry, pear shaped with one or two seeds. Flowering occurs between October to January and Fruiting from April to July from the age of 8-10 years. Propagation mostly occurs by seeds (Manandhar, 2002; Baral and Kurmi, 2006).



Picture 4: Flowers of Chiuri (left) and Chiuri seeds (right). Pictures by D. Pyakurel.

7.1.2 Habitat and distribution

It grows mainly in the foothills on steep slopes, ravines and cliffs at an altitude of 300 - 1,500m from east to west Nepal. Out of the 75 districts of Nepal, almost 50 districts are known to have Chiuri plants (MEDEP, 2010b). The geographical distribution extends from Darchula, Baitadi and Dadeldhura districts in the far-west to Dhankuta and Ilam district in the east. The total number of Chiuri trees in the country is estimated at 10.8 million and the

number of fruit bearing trees is estimated to be 5.62 million (MEDEP, 2010b). The highest number of trees (almost 40%) are found in the mid western development region (MWDR), which is followed by far western development region (FWDR). These two regions combined account for about 70% of the total number of trees in the country.

Shorea robusta, *Lagerstroemia parviflora*, *Terminalia alata*, etc. are the common associated tree species of Chiuri whereas *Pilea symmema*, *Ribes takare*, *Artemisia indica* are the associated shrub species. Chiuri cannot grow normally if vines such as *Xeromphis spinosa* winds around it.

7.1.3 Uses of Chiuri

Traditional use: The ripe fruits of Chiuri have sweet edible pulp. The fruit pulp supplements and sometimes substitutes staple food in the rural areas. According to local key informants, Chiuri juice is considered to make the body warm and possess intoxicating properties. Juice of the bark, about 4 teaspoons, is given to treat indigestion. The juice and ghee is also applied to treat rheumatic pain and boils. Seed oils are applied for headache, rheumatism, boils, pimples, wounds, chapped skin and burns. Chiuri ghee is one of the main sources of edible oil for rural communities, especially Chepangs (an indigenous underprivileged group mostly residing in Makawanpur, Chitawan, Dhading districts). This ghee is used to cook vegetables and roti (Nepali bread). Chiuri juice is also consumed to quench thirst. The plant constitutes an important source of nectar and pollen for bees. Leaves are used as plates and are also considered as a good fodder. Resin of Chiuri tree mixed with resins of Khirro (*Sapium insigne*) and Katahar (*Artocarpus heterophyllus*) makes good glue used for trapping birds and also houseflies. The pulp syrup is mixed with tobacco and used in “Hookka/Hookah”. The timber can be used in construction and for furniture.

Commercial use: The main product of tree is Chiuri ghee that is extracted from the seeds. The potential use of Chiuri ghee is found in different fields such as confectionery, pharmaceutical (as soothing cream for healing cracked skin), cosmetics, vegetable ghee production, candle manufacturing and soap making. It is also used as adulterant in animal ghee. It can also serve as source of saponin for industries in future.

Nutritional Value		
Total soluble solid	:	17.0-23.0%
Non-reducing sugars	:	8.31-11.9%
Reducing sugars	:	4.8-6.1%
pH	:	5.4
Vitamin C	:	38mg per 100 gm
Source: National Oilseeds and Vegetable Oils Development Board, 2008		

The cake produced after processing of Chiuri is used as manure which has pesticide properties and is used on paddy and banana plantations. It is also used as wormicide, nematicide, molluscicide, rodenticide and insecticide. The cake can be used as crude fish poison substituting the hazardous chemical pesticides. It can be used as feed in poultry farming after detoxification.

7.2 Value chain map of Chiuri

The current value chain of Chiuri focuses on Chiuri seed and ghee. The trading of Chiuri starts with the collection of seeds and ends with retail sale and export of ghee and finished products (mainly soap). Figure 13 presents the value chain map of Chiuri in the Rapti area. The map shows the roles and functions of the actors, their relationships and functions of the enablers. The functions of the actors are given in the left hand side while that of the enablers are given in the right hand side.

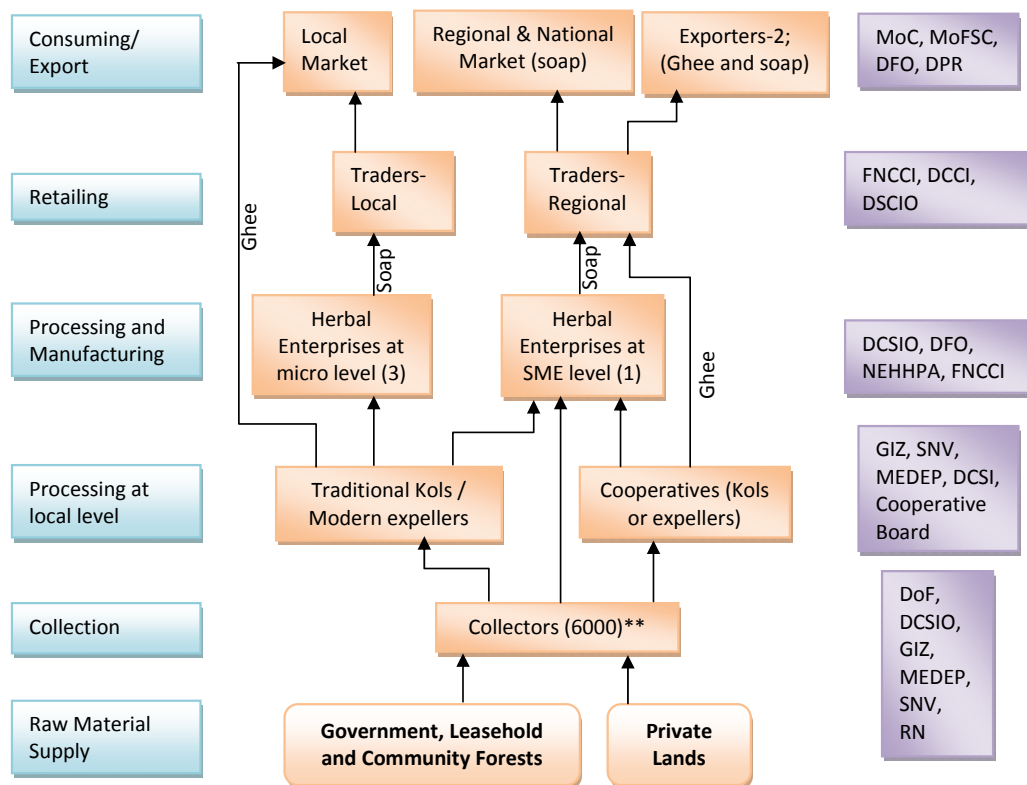


Figure 13: Value Chain Map of Chiuri harvested from Rapti Area

** Collectors either process themselves or sell the seeds to village level traders (21) who process or sell to the cooperatives

7.2.1 Roles and Functions of the actors and their relationships

Actors involved in Chiuri value chain can be categorized into different types according to their functions along the chain. They are collectors/farmers, traders (collective trading through cooperatives), primary processors (manufacturing ghee), secondary processors (manufacturing finished products), wholesalers, retailers and consumers. Short description of each actor and their respective functions are described as follows.

Collectors: Number of collectors varies as per the availability of the resource. For instance, there are about 1,000 collectors in Baddanda, Pyuthan; about 1,500 collectors in Liwang, Rolpa; and about 750 collectors in Laxmipur, Dang. Thus, it can be assumed that there are about 6,000 collectors in Rapti area (*outcomes of FGDs and individual consultation during the study*). Most of the collectors are poor households and members of disadvantaged groups (poor, ethnic minorities, Dalits, etc) who have little access to finance. The collection of Chiuri seeds is not a lucrative activity but individuals/households who have very limited income generating options are mostly involved in the collection.

Chiuri is collected for two to three months (July-August) which coincides with the busy rice transplantation season. On an average, each household collects about 100-500 kg (outcomes of FGD and MEDEP report) in whole season. The collected Chiuri is sold at the rate of Rs 25/kg. CFUGs charge small fee to the members and non members for collection. However, there is no information about the total number of families collecting Chiuri seeds.

Traders: There are few cooperatives in Rapti area that collects Chiuri seeds. Very few individual traders are involved in purchasing seeds. It is because collectors often process the ghee in Kols (traditional expellers), which are available around the collection area. Secondly, there are unseen expenses and informal taxes during the transportation from collection areas to processing units therefore traders are reluctant towards purchasing seeds. There are 5 traders in Liwang, 6 in Pyuthan and 10 traders in Dang who purchase seeds.

Processors: In most of the cases, collectors themselves are processors. In some cases, few cooperatives (such as Airawati Cooperative of Baddanda, Pyuthan) purchase seeds from farmers/collectors and extract Chiuri ghee from traditional Kols. The ghee are either sold to the individuals for household purpose or to the micro and small scale manufactures (both inside and outside Rapti area).

The traditional processing technology includes the wooden Chiuri butter expellers (Kols) which are manually driven and require four persons to operate. The daily expelling capacity of a Kols is about 150 kg of seeds. The modern expeller just requires an hour to process 100 kg with three working persons an efficiency gain of over 400% in terms of total daily output. The modern expelling plant is operated at Pyuthan (fabricated by Universal Equipment Industries, Butwal). The processing involves grinding seeds followed by boiling with the addition of equal amount of water and little amount of salt (40 gm/kg). The mixture is strained using fine cotton cloth after adding sufficient amount of water (usually 3-4 times in terms of volume) and left to solidify that takes somewhat between 3-4 hours in winter to two days in the summer season. The final product Chiuri butter is then packaged in plastic bags with 5 kg net weight, or in Sal/Chiuri leaf with 2.5 kg net at packing. The costing of modern expeller plant and per unit cost is given in Annex 7. The expeller machine is not efficient as the solidification of ghee in the plate is a major issue.

Finished Goods Manufacturers: Manufacturers in rural and urban areas are mostly manufacturing Soap from Chiuri ghee. Other products such as ointment and cosmetics are also being manufactured but by limited manufacturers. There are 3 soap factories in Pyuthan and 1 soap factory in Dang.

Exporters: Till date, there are two exporters who export Chiuri ghee to Italy and Germany (Alternative Herbal Products and Himalayan Biotrade). But both of these companies are purchasing Chirui ghee from Surkhet and Jajarkot and not from Rapti area.

There is inadequate data on the quantity of herbal soaps exported from Nepal. In any case the export market for herbal soaps presently is limited due to several reasons including the difficulty in meeting the quality standards and the regulations (such as FDA in the USA). Some specialized herbal soap producers have been exporting herbal soaps to overseas. Mahaguthi is probably the single important exporter of Chiuri based herbal soaps procuring directly from an herbal soap making micro-enterprise located at Pyuthan.

Input suppliers: There are suppliers of chemicals and oils based at Birgunj and Kathmandu. They import these chemicals and oils mostly from India. The main chemical used in herbal soap making is caustic soda and to some extent SLS (foam booster) is also used in soap making. A variety of oils are used in herbal soap making including Castor oil, Coconut oil, Neem oil and Palm oil.

7.2.2 Enablers

Enablers of “Chiuri ghee value chain” are those who work for the value chain actors and provide facilitating and regulating supports. Activities of enablers range from collection to end use including technology transfer, product development, advocacy for simplifying trade policy and procedures, organizing groups and networks for reinforcement and market information and linkages for better access. The major facilitating organizations and regulating agencies are given in the right hand side of the value chain map (Figure 13).

Enablers during raw material supply and collection: CFs, GFs and Private Forests (PFs) are the main source of Chiuri. DFOs and projects (MEDEP, GIZ, SNV, RN-MSFP, etc.) are supporting in the distribution of saplings through the local and partner NGOs and CFUGs. Projects are also involved in awareness creation towards importance of Chiuri and disseminating training on sustainable harvesting practices.

Enablers during processing functions: Projects, during the processing stage, provide business services such as bearing initial loss (pre operating cost), subsidy in purchasing improved expeller machine, research to develop efficient expeller machine, linking the producers to the potential market and support in diversifying the product, etc.

Commodity associations such as NEHHPA, JABAN, FNCCI, DCCI, HNCC, etc. are helping to create enabling environment for manufacture and trade by lobbying for policy facilitation.

Enablers during export: MoFSC (DoF and DPR) and MoICS (DCSI) are the major ministries involved in the export of herbal products. Both ministries are meant to formulate the trader friendly policies. DPR is responsible for the identification, laboratory testing and sealing of the containers.

7.3 Economic analysis of Chiuri ghee and soap

Before proceeding with the economic analysis of the Chiuri ghee extraction, it is helpful to understand the dynamics of Chiuri ghee extraction.

Table 30: Basic facts of Chiuri (compiled mostly from MEDEP, 2010c)

Total number of fruit bearing trees in the country	5.6 million
Total number of fruit bearing trees in Rapti zone	1.37 million
Number of tree per hectare	37-90
Average seed production per tree	50 - 75kg
Yield per hectare	500 - 800kg
Annual production of Chiuri ghee per household	100 - 500kg
Percentage sales by each farmer	50% - 60%
Oil yielding percentage (traditional Kols)	25% - 30%

Cost, sales and margins starting from seed collection to wholesale are given in the Table 31. The information given in Table 31 is compiled from the assignment of GIZ INCLUDE (Value Chain Analysis of Nepal Butternut during September - October 2013 in Pyuthan, Dang and Surkhet of MW Nepal). The effort of GIZ INCLUDE program is highly appreciated.

Table 31: Cost benefit analysis of Chiuri seeds, ghee and soap (source: GIZ INCLUDE, 2013)

Actors	Buying price (Rs)	Value added cost (Rs)	Cost of Production (Rs)	Selling Price (Rs)	Profit (Rs)	Profit Margin (%)
Collectors (for 1 kg seed)	-	-	-	25	-	-
Trader (for 1 kg seed)	25	7.8	32.8	40	7.2	22
Processor ghee (modern) for 1 kg ghee	100*	16	116	160	44	38
Processor ghee (traditional) for 1 kg ghee	120**	10	130	160	30	23
Soap manufacturer	187***	22	209	375	166	79
Wholesale/retail for 1 kg soap	375	5	380	625	245	64

* 2.5 kg seeds are required to process one kilogram of ghee from modern expeller machine

** 3 kg seeds are required to process one kilogram of ghee from traditional expeller machine

*** Rs 187 is required for purchasing raw materials including Chiuri ghee (220 gm @ Rs 160 per kg) of soap making

7.4 Supply and demand

7.4.1 Production/Supply

Rapti Specific: A total of 1,366,101 fruit yielding trees (almost 24.3%) are found in the five districts of Rapti zone. Rolpa has the highest number of them 311,394 fruit bearing trees, followed by Rukum with 279,395 trees. The number of fruit bearing trees in Pyuthan, Dang and Salyan are 276,026; 269,990 and 229,296 respectively (Table 32). Likewise, Rolpa has the estimated annual productivity of 5,242 tons of seeds per year and Rukum has the estimated annual productivity of 4,703 tons of seeds per year. The total estimated productivity of seeds and butter from Rapti zone are 22,996 tons and 9,049 tons respectively (Table 32). The Chiuri flowers are the most important source of nectar for honey bees. Honey bees can get nectar for more than 6 months in a year from Chiuri trees. Thus, Rapti area has a good potential for bee keeping and honey product business. Some of the pocket areas thus can be highly recommended for honey products such as: Baddanda, Swargadwari, Laxmipur, Rampur, Kalimati, Pokhara, etc.

Table 32: Resource potential of Chiuri in Rapti zone (MEDEP, 2010b)

District	Number of fruit bearing trees	Estimated Quantity of Chiuri Products (MT)			
		Fruits	Seeds	Butter	Honey
Dang	269,990	18,178	4,545	1,788	856
Pyuthan	276,026	18,585	4,646	1,828	875
Rolpa	311,394	20,966	5,242	2,063	987
Rukum	279,395	18,812	4,703	1,851	886
Salyan	229,296	15,439	3,860	1,519	727
Total	1,366,101	91,980	22,996	9,049	4,331

7.4.2 End Market/Demand

As it was mentioned (Table 30_7.3_Economic_analysis) that 40-50% of the total production of Chiuri ghee is consumed by the households thus the local communities are the major consumers of Chiuri ghee. In most of the cases, collectors themselves process the ghee (from traditional Kols) for domestic use. The ghee in local market is mostly purchased by the local communities therefore the demand is high in the local market. Likewise, the end market for rest of ghee is either soap factories or exporters.

The total production of Chiuri ghee in Rapti area is around 9,049 tons per year. While the total export of Chiuri ghee from Rapti area is less than 15 tons per year. Rest of the ghee is consumed by soap manufacturers. The end markets for soap are local, regional, national and international markets. The quality of ghee used to manufacture soap varies considerably as per the end market. Superior quality raw materials are used to manufacture export quality products (as per the requirement of end market).

7.5 SWOT analysis

Table 33 presents the SWOT analysis of Chiuri. Along with the SWOT analysis, opportunities and constraints are also identified at each level.

Table 33: SWOT analysis of Chiuri Value Chain

Strength	Weakness
<ul style="list-style-type: none"> ➤ Rapti zone is the reservoir of Chiuri ➤ Kols are available in all the pocket areas ➤ Chiuri is a key ingredient of herbal soap 	<ul style="list-style-type: none"> ➤ Quality of ghee ➤ Inadequate research and development on processing technology ➤ Collectors safety and their unwillingness because of the low price ➤ Inadequate information on the multiple use of Chiuri ➤ Inadequate marketing and promotion skills
Opportunity	Threat
<ul style="list-style-type: none"> ➤ Increasing demand of herbal products in the global market ➤ Potentiality of producing herbal products 	<ul style="list-style-type: none"> ➤ High quality standards of the export ➤ Substitutes (e.g., palm oil) ➤ High cost of herbal soap

7.6 Opportunities and issues/constraints

Opportunities and issues/constraints at each level are given in Table 34.

Table 34: Opportunities and Constraints/ Issues

Actors	Opportunities	Issues/ Constraints
Collectors	<ul style="list-style-type: none"> ➤ If the market is guaranteed, the collection quantity can be increased because there are plenty of resources ➤ Collective marketing of seeds and butter 	<ul style="list-style-type: none"> ➤ Due to low value, collection of Chiuri is a part time engagement for the collectors ➤ High risk during collection due to difficult terrain ➤ Fruiting mostly occurs in the alternative year ➤ Inadequate human resource during collection because the collection time coincides with paddy plantation

Actors	Opportunities	Issues/ Constraints
Chiuri Ghee Processor	<ul style="list-style-type: none"> ➤ Quality of ghee from traditional Kol is good and is accepted by international buyers ➤ Kols are available in Chiuri pocket areas ➤ Custom designed expeller machine by professionals will result in better efficiency and reduce cost of production of ghee ➤ Improvements in quality of ghee will promote cosmetics products made from Chiuri ➤ Oil extraction is high (40-45%) in improved machine 	<ul style="list-style-type: none"> ➤ Expeller machines are not custom designed for Chiuri ➤ Existing expeller machine has not shown good results and currently not in operation ➤ Drying and storage of Chiuri seeds ➤ Inadequate space for drying (needs collective drying centre) ➤ Traditional processing technique is labour intensive and require 4-5 people ➤ Solidification of ghee in the extraction unit causing congestion during ghee processing is a big issue
Trader (seeds)	<ul style="list-style-type: none"> ➤ Some cooperatives have capacity to purchase the seeds ➤ Cooperatives could be engaged in the value addition activities ➤ Retail shop owners have the capacity to invest capital in purchasing seeds from the collectors 	<ul style="list-style-type: none"> ➤ Very few traders and cooperatives are involved in purchasing seeds ➤ Cooperatives have insufficient capital to purchase seeds in cash ➤ Unseen expenses and informal and multiple taxes during transportation
Trader (ghee)	<ul style="list-style-type: none"> ➤ Some cooperatives are engaged in purchasing ghee from processors and selling them to the consumers and exporters ➤ High potentiality of export 	<ul style="list-style-type: none"> ➤ Difficulty in long term storage due to inadequate technology and low capital investment
Soap manu-facturers	<ul style="list-style-type: none"> ➤ Ample scope for producing herbal products ➤ Shifting preference of consumers towards herbal products 	<ul style="list-style-type: none"> ➤ High cost of raw materials results the higher cost of products ➤ Inadequate investment in research and development ➤ Use of chemical (Sodium Lauryl Ether Suplhate - SLES) as foaming agent may be contaminated with dioxin ➤ Inadequate entrepreneurship and marketing skills

Actors	Opportunities	Issues/ Constraints
Consumption	<ul style="list-style-type: none"> ➤ Saponin can be removed by acidification ➤ Could be used in cosmetics, ointment, herbal preparations. etc. 	<ul style="list-style-type: none"> ➤ Inadequate research and development on its edibility ➤ Presence of saponin (not recommended for consumption) ➤ Due to high cost, monasteries are not using Chiuri ghee
Exporters	<ul style="list-style-type: none"> ➤ Plenty of ghee for export 	<ul style="list-style-type: none"> ➤ The quality of ghee is a big issue. With existing technology, it is hard to meet the quality requirement of the importing countries

The market based solutions for strengthening of business services are provided as BDS strategy in next section as a part of Value Chain Upgrading Strategy.

7.7 Value chain upgrading strategy

As mentioned earlier in methodology, upgrading strategies at different levels (instead of interventions and recommendations) is proposed in this report. The value chain upgrading strategies for Chiuri is presented considering the seven parameters as given in Table 3_ Upgrading_strategy. These strategies are expected to provide in-depth information to the project to develop action plan for each of the strategy for value chain upgrading in coming days. The strategy for upgrading Chiuri Value Chain is presented as:

7.7.1 End Market Strategy

End market strategy is prepared to fulfil the gap between market requirements and present status. Spiderogram is used to present the end market strategy. In case of Chiuri, seven parameters were used to prepare spiderogram (Figure 14).

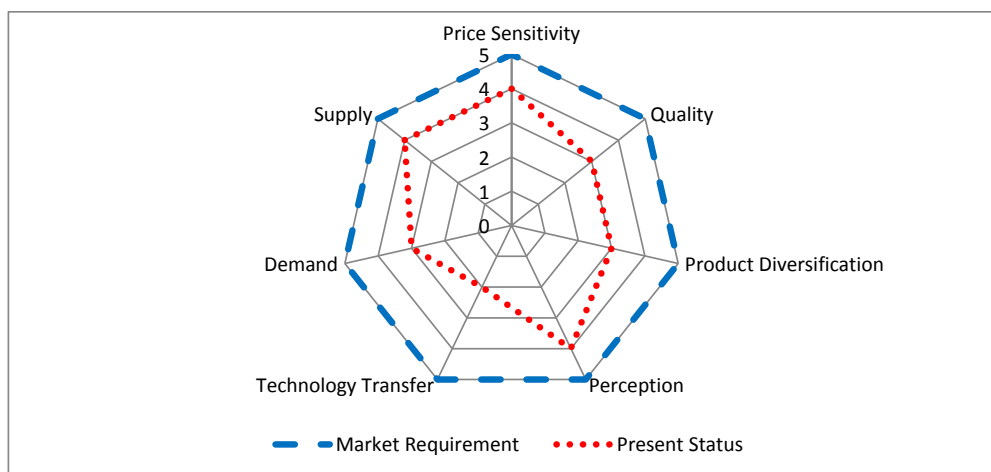


Figure 14: Spiderogram to develop End Market Strategy for Chiuri Value Chain.

The numbers given in the spiderogram are based on the following parameters and criteria.

Table 35: Parameters for end market strategy

Parameters	1	2	3	4	5
Price Sensitivity (seed and ghee)	Worst price negotiation between collectors/processors and traders	Weak price negotiation between collectors/processors and traders	Moderate price negotiation between collectors/processors and traders	Good price negotiation between collectors/processors and traders	Best price negotiation between collectors/processors and traders
Quality (seed & ghee)	Inferior	Low	Moderate	Good	Excellent
Product Diversification (from ghee)	Selling only ghee	Single product line (e.g., soap)	Two product lines (soap, ointment)	More than two product lines with equal volume	More than two product lines with equal volume; ensuring quality with intl. standard
Perception	Inferior	Low	Moderate	Good	Excellent
Technology transfer (ghee extraction)	Traditional Technology (Kol)	Conventional Expeller	Expeller specific to process chiuri ghee	Expeller with heating plate or running hot water to minimise jamming	Sophisticated expeller specific to process Chiuri ghee
Demand (from consumers)	Low demand	Limited demand	Moderate demand	Good Demand	Mass demand
Supply (from processors, traders, manufacturers)	Low supply	Limited supply	Moderate supply	Good supply	Mass supply

The spiderogram shows that the strategy has to be focused on reducing the gap in terms of quality of seed and ghee; product diversification; technology transfer and creating demand.

a. Gap in quality of seed and ghee

Inadequate post harvesting skills results into fungal infection of the seeds, reducing the quality of seeds and ghee. Likewise, inadequate space for drying is another reason of inferior quality of seeds. Training on post harvesting technology and construction of multipurpose drying house are crucial in the area.

The ghee extracted from Kols may contain foreign materials. In few cases, traces of iron particles were seen in the ghee extracted from the expeller machine. Thus, it is urgent to invest on research and development to develop expeller machine specific to Chiuri ghee.

b. Gap in Technology Transfer

Currently, two methods are used to extract Chiuri ghee. They are: traditional Kols and expeller machines developed in Nepal. The expeller machine is more efficient in terms of oil extraction (40-45% in modern machine, 25-30% in traditional kols) but the congestion (solidification of oil into ghee below 32°C) is a major issue. The expeller machine being used branded “Sundhara” is not actually designed to extract Chiuri ghee.

Therefore, it is mandatory for all projects and organizations working in Chiuri to make considerable investment in the development of specific Chiuri expeller machine that has higher oil yield capacity and prevents jamming/solidification (innovations may be: heating the plate or running hot water beneath plate to prevent solidification).

c. Gap in product diversification

The manufacturers are mostly manufacturing soap from Chiuri ghee despite the fact that it can be used to produce several products such as ointment, cosmetic items, candle, etc. Likewise, there is ample opportunity to develop vegetable ghee by proper detoxification (scientific verification is necessary). Therefore, there is need to invest on research and development for the diversification of the products.

d. Gap in Demand

Discussion with the exporters has concluded that the demand of Chiuri ghee is growing steadily in international market. Contrarily, due to high prices of the finished products, their demand is quite less in domestic market. Thus, the price has to be lowered by introducing the improved technology to extract ghee and manufacture soap.

7.7.2 Firm level upgrading strategy

Product upgrading

From the wide range of consultations with collectors, processors, finished product manufacturers and ghee exporters, it has been identified that Chiuri ghee is the most important product in the Chiuri Value Chain. Though there are ample opportunities for upgrading the products like soaps and ointments, in case of Rapti zone, it is important to upgrade the Chiuri ghee as it has good demand in local, regional, national and international market. There are two options available for product upgrading: (1) appropriate technology transfer (at industrial scale) for quality ghee production; and (2) upgrading the existing Kols for more ghee extraction. Following four parameters should be considered in upcoming three years, as far as product upgrading is concerned.

Table 36: Product upgrading for Chiuri Value Chain based on four parameters

Parameters	Present	Year 1	Year 2	Year 3
Product	Chiuri seed- 22,996 tons (potential in Rapti area); Chiuri ghee- 9,049 tons (potential)	Focus on Chiuri ghee processing using traditional Kols and existing expellers (with needed advancements)	Focus on Chiuri ghee processing by introducing improved, Chiuri specific expeller machine; minimize the use of Kols; Support in product diversification (soap)	Mass processing to increase the quantity of ghee production by 20% (resource is available); Support in product diversification (soap, ointments, cosmetics)
Price (based on present price)	Chiuri seed- Rs 25 - 30/kg; Chiuri ghee- Rs 150 - 160/kg	Chiuri seed- Rs 30 - 35/kg; Chiuri ghee- Rs 150 - 160/kg (Linking the producers with buyers)	Chiuri seed- Rs 35 - 40/kg; Chiuri ghee- Rs 160 - 170/kg (Decrease in production cost by 20% using Chiuri specific expeller machine)	Chiuri seed- Rs 40 - 45/kg; Chiuri ghee- > Rs 170/kg (Decrease in production cost by 20% using Chiuri specific expeller machine and increase the productivity)
Place	End market: mostly local market; and to some extent soap industries	Ghee exported outside Rapti and to the exporters	Ghee exported outside Rapti and to the exporters	Ghee exported outside Rapti and to the exporters
Promotion	Consumed by locals yet have doubt on its edibility.	Awareness about multiple use of ghee; sustainable management of trees	Promotion of Chiuri in national and international market (focusing on its benefits and making real case stories)	Promotion of Chiuri in national and international market (focusing on its benefits and making real case stories)

Process upgrading

The process upgrading refers to the whole process from collection to post harvesting practices (drying, storage), ghee processing (both on traditional Kols and existing expeller machine) and soap and other products development. The processes of Chiuri ghee extraction and soap making are given below:

The upgrading required in the major steps of Chiuri Value Chain is given in Table 37.

Table 37: Process upgrading matrix for Chiuri Value Chain

Process Upgrading	Existing practices	Recommended practices	Technology used and cost	Anticipated benefits
Upgrading 1: Collection	Climbing trees to collect seeds (which is risky); collect fallen seeds	Train collectors to use long handled secateurs; use safety belts and special basket to keep the collected seeds	Not more than Rs 2,000 per person to purchase secateurs, belts, basket, etc.; Use good collection practices	Improved personal safety
Upgrading 2: Post harvesting	Difficulty in drying due to inadequate drying space	Drying in collective drying centre (can also be used to dry ginger, mushroom, vegetables, etc.)	Drying can be done inside plastic houses (similar to green houses) or on solar drier	Well dried and superior quality seeds
Upgrading 3: Processing	Processing either in traditional Kols or in expeller machine	Use of innovative, Chiuri specific expeller machine (e.g., with heating plate or running hot water beneath the plate)	Might cost around Rs 800,000 - 1,000,000	High yield; high efficiency; low cost of production; quality output (ghee)
Upgrading 4: Soap making	Manufactured in small scale	Should focus on domestic market by decreasing the price (using Chiuri specific expeller machine)	Mass production	Geometrical expansion in consumption after lowering the price; more benefit to value chain actors
Upgrading 5: Product Diversification	Mainly focusing on sale of ghee followed by soap; only few companies are manufacturing other products	Should diversify the products by manufacturing ointments, candles, cosmetic products, vegetable ghee. etc.		High consumption of raw materials within the nation; more employment and income generating opportunities; more benefit

Channel upgrading

Currently, three channels are being followed in Chiuri Value Chain. First channel is for seed, second is for ghee and third is for soap in case of Rapti area.

Functional upgrading

The functional upgrading of the actors of Chiuri Value Chain should be carried out in the following ways:

Table 38: Functional upgrading matrix for Chiuri Value Chain

Actors	Present Function	Upgraded Function
Collector	<ul style="list-style-type: none">➤ Collection mostly from GFs and CFs, few from private forests➤ Collectors tend to overharvest from wild➤ Inefficient drying practices	<ul style="list-style-type: none">➤ Promote the cultivation of Chiuri in CFs and private lands➤ Promote sustainable harvesting from the wild➤ Drying in plastic houses or in solar drier, collective drying centre➤ Make collectors group to fetch better price for seed and ghee
Trader / cooperative	<ul style="list-style-type: none">➤ Buy seeds from collectors and sell to mass processors/cooperatives	<ul style="list-style-type: none">➤ NA
Ghee processor	<ul style="list-style-type: none">➤ Processing in Kols or in expeller machine➤ Sell to manufacturers or traders	<ul style="list-style-type: none">➤ Need modern expeller machine that is specific to Chiuri➤ Mass processing
Soap manufacturer	<ul style="list-style-type: none">➤ Manufacturing soaps	<ul style="list-style-type: none">➤ Diversify the products
Exporters	<ul style="list-style-type: none">➤ Only two companies are involved in export of Chiuri➤ Export quantity is limited	<ul style="list-style-type: none">➤ Export in volume and disseminate the technology to process standard ghee➤ Quality and leak proof packaging during export

Trans-sectoral upgrading

There exists the alliance between the CFUGs (having plenty of Chiuri trees) and the bee owners. Bee owners from Chitwan, Makawanpur, etc. bring bees to graze in the Chiuri rich CFs to produce “Chiuri honey”. It is the best example of trans-sectoral upgrading and is already in practice in Laxmipur of Dang district, Baddanda of Pyuthan district and several other areas of Rapti. Such practice of trans-sectoral upgrading should be replicated in other potential areas.



Figure 15: Chiuri ghee extraction process.



Figure 16: Steps of soap manufacturing.

Interfirm upgrading

The interfirm upgrading should to be carried out by:

Formation of alliance among cultivators/collectors, processors (ghee or butter manufacturers), soap manufacturers at district and national level so that products quality and marketing are assured throughout the value chain.

7.7.3 Business development and financial services strengthening

The assessment of Business Development Services (BDS) and Financial Services (FS) in this report also considered:

- Categorization of demand side (from beneficiaries' i.e., value chain actors' side into very strong, strong, weak and very weak categories); and
- Categorization of supply side (from BDS providers' side into very strong, strong, weak and very weak categories).

Table 39: Analyzing demand and supply side of BDS and FS for Chiuri Value Chain

SUPPLY SIDE OF BDS	Very strong		Mobilization and sensitization of user groups in collective marketing and business orientation		
	Strong		Access to market information	Product diversification	
	Weak		Safety first	Access to financial services; Improvement in existing Kols	
	Very weak				Modern expeller machine
	Very weak	Weak		Strong	Very Strong
DEMAND OF SERVICES BY VALUE CHAIN ACTORS					

Business services that are in demand of the beneficiaries (i.e., in categorization very strong, strong and weak) and supply side of service providers (very weak, weak and strong) are selected to develop commercially viable option for these business services. Table 40 presents the commercially viable strategies/options for the needed services:

Table 40: List of commercially viable business options for Chiuri Value Chain

Services	Strategy
Technology	<ul style="list-style-type: none"> ➤ Technology transfer to <ul style="list-style-type: none"> ○ extract ghee using Chiuri specific expeller machine ○ diversify the products (beyond soap) ○ ensure the quality production of ghee (without adulteration)

Services	Strategy
Training and Knowledge	<ul style="list-style-type: none"> ➤ Exposure visits and knowledge to diversify the product ➤ Training on safety measures (during collection)
Market Information	<ul style="list-style-type: none"> ➤ Provision of market information through linkages with traders and exporters and organizations like GIZ, SNV, ANSAB, MEDEP working for NTFPs marketing ➤ Enhanced use of multipurpose cooperatives to maintain the price list ➤ Coordination and linkage between cooperatives, traders and product manufacturers
Market Access	<ul style="list-style-type: none"> ➤ Collective marketing or marketing in group (at collectors level)
Financial Services	<ul style="list-style-type: none"> ➤ Provision of collateral free loan to processors and product manufacturers and facilitate the business by providing easy loan payment scheme ➤ Subsidy for technology transfer by donor agencies, bilateral aid agencies, projects, programmes, etc. ➤ Use of cooperatives to provide loan to processors, ensuring that the processors sell the ghee to cooperatives

7.7.4 Strategy for Business Enabling Environment:

The specific business enabling environment issues that need to be addressed are:

- Chiuri is the most promising product in the mid-west region with ghee and soap as exportable items. DDC, government line agencies, projects and programmes should promote Chiuri, focusing on technology transfer (expeller machine) and marketing.
- Policy and administrative hindrances such as multiple taxation and lengthy procedure to collect the transportation permit, etc. have to be minimized to create business enabling environment. RN has to coordinate with likeminded institutions and start lobbying.
- Continuous dialogue with commercial and development banks, financial institutions and cooperatives to invest in this sector and facilitate the small and micro entrepreneurs to prepare business plan before applying for loan.
- Secure commitment from the local political leaders to build consensus to promote the herbal sector.

7.7.5 Sustainability Strategy

In order to ensure the sustainability of Chiuri Value Chain, it is crucial to provide buy back guarantee to the manufacturers and link them to the producers.

7.8 Interventions

Above strategies can provide following immediate and short term interventions in a nutshell.

7.8.1 Policy

- i. Lobby and advocate for simplifying government procedures and waiving taxes.
- ii. Encourage farmers to register private trees in District Forest Office.

7.8.2 Collection

- i. Training on personal safety, sustainable collection and post harvesting technique of Chiuri.
- ii. Develop mechanism that will ensure the participation of poor and disadvantaged groups/ households for Chiuri collection.

7.8.3 Processing

- i. Construct common drying centre (plastic houses or driers) to dry Chiuri seeds.
- ii. Invest in research and development of “Chiuri specific” expeller machine and purification machine.

7.8.4 Marketing

- i. Ensure buy back guarantee.
- ii. Encourage collectors to organize in groups for collective marketing.
- iii. Provide marketing support to small enterprises.
- iv. Promote marketing through specialized marketing agents.
- v. Facilitate business linkages between ghee/seed processors and large scale manufacturers (sub contracting mechanism).
- vi. Strengthen and expand local cooperatives.
- vii. Provision of micro finance to the small enterprises (micro finance schemes provided by banks and other financial institutions).

7.8.5 Cross cutting

- i. Integrate with Chiuri honey sub sector.
- ii. Collaborate and establish network with other programmes and projects working in the promotion of Chiuri sector.

SECTION EIGHT: VALUE CHAIN ANALYSIS OF WOOD FURNITURE

This section presents the value chain analysis of furniture of Rapti area. The layout of this and the following section (section eight and nine) slightly differ from the above three value chains because there is remarkable difference between the approaches for timber and non timber forest products. However, the main essence of this report i.e. “value chain upgrading strategy” is in similar format.

8.1 Introduction of wood furniture industries

Forests together with shrubs cover about 5.83 million ha (39.6%) of the total land areas of Nepal (www.dof.gov.np). About 75% of forests are highly productive and are capable of producing valuable timber and non timber forest products (NTFPs) to contribute to national economy. Forestry sector of Nepal contributes 9.45% to GDP (DFRS, 2008). A study revealed that the forestry sector provides employment to 9.23% of the total economically active population in the country (ERI, 2011). The total revenue generated from the sales of the forest based finished products was Rs 241.6 million in FY 2010/011 and the total employment generated was 121,291 person-days (as per the study report on the status of 134 forest based enterprises supported by NSCFP, LFP and IFP in 18 districts of Nepal).

Promotion of forest based enterprises is one of the major areas of intervention to create employment and income generating activities from the forestry sector. The scope of wood furniture is high in Nepalese context because of the availability of Timber (forest resources), skilled and unskilled human resource and social and cultural beliefs. At the same time, Wood Furniture industries are providing employment opportunities to both domestic and foreign (mostly Indian from Bihar, Uttar Pradesh and West Bangal) labours. Wood furniture in Rapti area mostly uses round logs and sawn timber as input materials. There are two main types of products from these enterprises:

- a. House construction materials (door and windows frames, door panels) and
- b. Furniture
 - ♦ Beds (low bed, box bed and conventional bed)
 - ♦ Cupboards and Kitchen cupboard
 - ♦ Tables and Chairs
 - ♦ Dining Table
 - ♦ Simple Sofa set
 - ♦ Partitions in offices
 - ♦ By-products (firewood and saw dust)

The wood furniture is selected as a potential value chain from the Focus Group Discussions, experts’ consultation and situation analysis. The current report mainly focuses on the value chain analysis of wood furniture of Rapti area. The value chain mainly focuses on door

and windows, beds, table and chairs and cupboards as these are the mostly manufactured and traded segments amongst the other wood furniture. It should be noted that house construction materials (door and window frames) are not regarded as furniture but it is the main product of rural/community based food furniture industries and is the basis of income and employment therefore it is included in the analysis.

8.2 Value chain map of wood furniture

The current value chain of wood furniture focuses on different level of furniture industries and secondly the range of products. Figure 17 presents the value chain map of furniture in the Rapti area. The figure shows the roles and functions of the actors, their relationships and functions of the enablers.

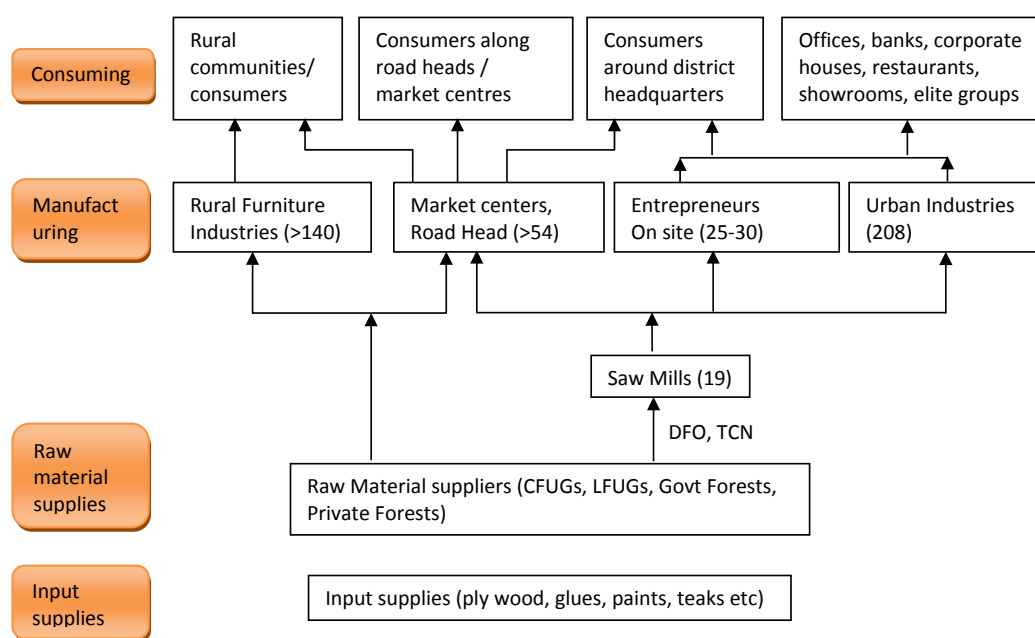


Figure 17: Value Chain Map of Wood Furniture.

8.2.1 Roles and functions of the actors and their relationships

There are three tiers of actors viz. micro, meso and macro level actors in the wood furniture value chain. At the micro level, there are saw mills, wood furniture manufacturers and retailers. At the meso level there are CFUGs, LFUGs and private forests owners who provide the logs. At the macro and policy level, there are institutions such as the Cottage and Small Industries Development Board (CSIDB), District Cottage and Small Scale Industries (DCSI), Department of Cottage and Small Scale Industries (DCSI), Ministry of Industry, Commerce and Supplies (MoICS), Timber Corporation of Nepal (TCN), District Forest Offices (DFOs),

Department of Forests (DoF) and Ministry of Forests and Soil Conservation (MoFSC) which formulate and implement policy. The structured and predetermined role of these major stakeholders and interactions amongst them influences the value addition and price mechanism of wood furniture.

Raw Material Suppliers: CFUGs, LFUGs, Private Forest owners are regarded as primary suppliers of raw materials who in most of the cases supply the logs. There is specific mechanism to provide the wooden logs in case of CFs and LF and the process is governed by District Forest Office. CFUGs and LFUGs can allocate the specified quantity of wood/logs for their internal use as per their operational plan, which is a relatively easier process. Private forest owners have to get permission from District Forest Office to cut the standing trees and sell to saw mills.

Another source of raw material is from GFs. Generally, District Forest Office and TCN are involved in the collection and sale of timber from government managed forest. But in the recent years, the supply of timber is hindered by the notification of Commission for the Investigation of Abuse of Authority (CIAA), policy makers' conservative approach rather than focusing on scientific management, discretion of DFO officials, etc.

Saw Mills: Wooden logs for 19 saw mills within Rapti Zone (9 in Dang, 6 in Rolpa, 2 in Salyan and 2 in Pyuthan) are mostly sourced from within the five districts of Rapti zone. Furniture industries at Rukum have small bandsaw and they process the log on their own. Woods of different qualities (Sal, Sissoo, Saj, Kadam, Utis, Salla, etc.) are collected from GFs, CFs, LF and private lands. Logs from GFs are generally auctioned. Saw mills purchasing auctioned logs saw them into sawn timber and sell to the furniture industries. The TCN is involved in collection and sale of logs from GFs. The productivity of saw mills vary according to their scale of operation but rural saw mills can process about 3000 cu. ft. of timber in a year.

The selling price of timber varies according to the type of timber. For instance, a cubic feet of Sal costs around Rs 4500, that of Sissoo costs Rs 2200 - 2700, that of Salla costs Rs 1200 - 1500 and so on.

Furniture Industries:

It was estimated that there are around 400-420 furniture industries in Rapti, out of which about 240- 250 are registered and 150-160 are not registered. However, the number of not registered industries can be far higher than this.

- ♦ There are different levels of furniture industries in Rapti area. They are:
- ♦ Industries that target their products to rural communities/villagers;
- ♦ Industries that target their products to villages and district headquarters;
- ♦ Industries that target their products to offices, banks, restaurants, etc.; and
- ♦ Individuals who construct furniture on site.

a) Industries that target their products to rural communities:

LFP/IFP, MEDEP, CSIDB and other organizations have provided basic furniture making trainings to the rural community members. Those trained individuals along with others are operating the wood furniture enterprises to meet the basic demand of communities of the rural areas. The CFUG members bring the raw materials (wooden logs) to the enterprise and the entrepreneur manufacture items on demand. Mostly, they manufacture door and window frames, doors and conventional beds and the entrepreneurs charges for the service, which in nominal (for e.g.: Rs 300 to made a door frame, Rs 500 - 600 to make window frame, Rs 700 - 1000 to make simple bed, etc.). Their services rarely reach to the urban areas. There are more than 100 such rural enterprises - that are yet to be registered - in operation in the area.

b) Industries that target their products to village and district headquarters:

These industries are usually located at or near the district headquarters and fulfill the demand of neighbouring communities. They either purchase logs/timber and manufacture furniture on demand or customer brings logs/sawn timber and they manufacture the requested products and charge for the service. These industries usually source wood from Saw mills, private lands, CFs, etc. They rarely manufacture furniture for later sale. There are more than 50 such enterprises in Rapti area.

c) Industries that focuses for quality production and that target their products

Can be categorised into two groups: (a) industries that manufactures furniture for household use and, (b) industries that manufacture products for banks, offices, etc. They are mostly registered and their number is around 208 (Annex 8).

The number of furniture industries under the first category is highest in all five districts, but even higher in Ghorahi and Tulsipur. Both cities are growing into big cities and population of both the cities are rapidly increasing. They mostly focus the households who have substantial income to purchase furniture. Along with others, their regular customers are employees, teachers or small scale businessmen. These industries mostly manufacture cupboard, dining tables, tables, chairs, sofas and beds.

The number of industries that manufacture quality and well furnished furniture are less than three in Dang district (1 each in Lamahi, Ghorahi and Tulashipur). They mostly manufacture products and sell to banks, offices, corporate houses, etc. In the recent years, with the advancement in income (from remittance, business and jobs in I/NGOs), individuals are also attracted towards those types of furniture. The price is generally high due to the quality of timber used and better finishing.

d) Individuals who construct the furniture on site:

The fourth group are those furniture entrepreneurs who provide their services on the site. They visit the customer's house and produce the requested products on site. They generally charge low service charge (as they do not have to pay rent and bear other additional costs) and most of them are not registered. This has resulted into loss of revenue to the government. They are posing serious threat to the existing furniture industries that have sales outlets in cities. Consultation with entrepreneurs at Dang suggested that there are around 25-30 such individuals, of which, more than 70% are from India.

All the furniture industries and individuals manufacturing furniture on site use the timber that is harvested mostly from the Rapti area (in very few cases, entrepreneurs use the timber that is harvested from Kohalpur, Banke).

Chinese Furniture Show Room: The Chinese furniture was imported for the first time some five years back in Kathmandu and in early 2010, it was introduced to Dang. During its early years, it attracted most of the customers due to its elegant look and superb finish. They can supply the mass demand at a time, which was not possible for domestic manufacturers. The domestic furniture industries face serious threat at that time.

But after two-three years, there was serious complain about the quality. Chinese furniture that was introduced to Nepal was made from compressed wood and they were “very fragile” and their life span was very low, about 2 years for chairs. Thus, the demand got shifted back to domestic wood furniture. Right now there are two Chinese Furniture Show Rooms in Rapti area but they are now selling both Nepalese (80%) and Chinese (20%) products.

Malayasian Wood: Due to the inadequate supply of timber from within the country, traders and importers are importing sawn and seasoned timber mainly from Malaysia. The quality of imported timber is equivalent to that of Saaj (Rs 2200 - 2500 per cu. ft.) but the price is high, almost equal to that of Sal (Rs 4500 per cft). However, till date use of Malaysian wood is not reported in the Rapti area because of the small market size and moderate supply of timber from PFs, CFs and GFs.

Consuming: A total of 295,808 households reside in Rapti zone (Nepal Housing and Population Census. 2011). Literally, all of them are the potential consumers and also the demand side stakeholders. Consumers of rural communities demand for frames and simple beds. Consumers at road heads and near headquarters demand for cupboards along with frames and beds. Likewise, urban and headquarter dwellers demand for all types of products being manufactured locally.

Input Suppliers: The suppliers that supply accessories needed to manufacture the furniture are known as input suppliers. They are: paint stores, hardware shops (nails, screws, teak, dendrites, glues, ply wood, sun-mica, saws, etc.), carpentry accessories stores, etc. It was observed that there is a good network of input suppliers in the Rapti area and are supplying the raw materials to all types of furniture industries.

8.2.2 Enablers

MoFSC, DoF, DFO, TCN, CSIDB/DCSI, MoICS, CFUGs, etc. are the policy level enablers at meso and macro level. The operational plan of CFUGs determines the quantity of timber to be collected each year. CSIDB/DCSI both are involved in registration of furniture industries and keeping the updated information. CSIDB also provide training to the new and established entrepreneurs. DFO play major role in the furniture value chain. The operational plan of CFUGs has to be approved by DFO, even the private land owners have to take permission from DFO to cut the trees of private lands. DFO again is guided by the five year forestry plan which needs to be approved by DoF.

The Timber Corporation of Nepal is semi autonomous government body that has authority to sell the timber throughout Nepal in coordination with District Forest Offices.

The commodity associations facilitate the production and sale of furniture by addressing the policy issues. Nepal Furniture and Furnishing Association at the central level and its district offices at district level are the commodity associations. It was observed that the district commodity association are not active in raising voices towards the trade barriers.

Other enablers are Nepal Ban Paidawar Udhyog Byabashi Mahasangh, its district offices, Nepal Furniture and Furnishing Association, etc.

8.3 Opportunities and constraints

The constraints and opportunities at each level of the furniture value chain are given in the Table 41.

Table 41: Opportunities and constraints of furniture industries in Rapti area

Level	Opportunities	Constraints
Saw mills	<ul style="list-style-type: none"> ➤ Rapti area is rich in forest resources ➤ DFOs of all five districts are preparing the five year District Forestry Plan with provision to harvest timber 	<p>Resource Constraint</p> <ul style="list-style-type: none"> ➤ The uncertainty of the wood supply can be regarded as the major bottleneck to the development of wood-based industries because understandably nobody wants to invest in upgrading or enlargement of facilities unless there is an assured long-term wood supply for the mill ➤ The price of timber is increasing day by day. The government rate of Sal is Rs 800/ cu.ft. The minimum rate of auction by TCN is Rs 1400/cu.ft. and it is generally auctioned at Rs 2000 - 2500/cu.ft. There are other informal fees during transportation. Thus, when the timber reaches to the consumer, its rate is around Rs 4300 - 4500/cu.ft. for Sal. Consequently, saw mills are finding hard to manage the timber supply. <p>Policy Constraint</p> <ul style="list-style-type: none"> ➤ Distance rule (3 km and 5 km) <p>Others</p> <ul style="list-style-type: none"> ➤ Unavailability of three phase line in rural areas and heavy power cut during peak hours.

Level	Opportunities	Constraints
Furniture Industries (in rural areas)	<ul style="list-style-type: none"> ➤ Strong and durable furniture ➤ Availability of raw materials in the rural areas ➤ CFUG members are getting timber in price as low as Rs 300/cu.ft. (according to their OP) ➤ Provision of harvesting timber in CFUG OPs 	<p>Resource Constraint</p> <ul style="list-style-type: none"> ➤ CFs have limited provision of timber harvest - only sufficient enough to meet the demand of their users. The rural enterprises without or with limited timber supply mostly sell their services and rarely the products. If these enterprises have to buy timber from other areas, the rural communities cannot afford it. Provision of providing at least minimum quantity of timber to forest based entrepreneurs is completely lacking. ➤ Inadequate financial capital for scaling up thus need soft loan support from resourceful organizations (CFUGs, MFIs, cooperatives, etc.). <p>Policy Constraint</p> <ul style="list-style-type: none"> ➤ Most of these rural entrepreneurs are not registered to CSIDB/DCSI because as per the act, furniture industries in the rural areas cannot be registered (Distance rule). <p>Technology and Management Constraint</p> <ul style="list-style-type: none"> ➤ Inadequate skills to manufacture designed products. ➤ Lack of business plan and management. <p><u>Others</u></p> <p>Unavailability of three phase line in rural areas and heavy power cut during peak hours.</p>
Furniture Industries (near highway and around market centres and district headquarters)	<ul style="list-style-type: none"> ➤ Strong and durable furniture ➤ High demand of furniture due to in-migration 	<p>Resource Constraint</p> <ul style="list-style-type: none"> ➤ Availability of Timber ➤ Inadequate financial capital for the scaling up, needs soft loan from resourceful organizations (CFUGs, MFIs, cooperatives etc) <p>Pricing</p> <ul style="list-style-type: none"> ➤ High price of Timber <p>Policy Constraint</p> <ul style="list-style-type: none"> ➤ Registration of industries which are located along the highways and market centres <p>Others</p> <ul style="list-style-type: none"> ➤ Load Shedding ➤ Unavailability of skilled labour

Level	Opportunities	Constraints
Furniture industries near in district/ regional headquarters and manufactures quality products	<ul style="list-style-type: none"> ➤ Strong and durable furniture ➤ Growing demand for designed and elegant furniture ➤ Entrepreneurs are learning how to make designer furniture with reference from Chinese and imported furniture 	<p>Resource Constraint</p> <ul style="list-style-type: none"> ➤ Inadequate financial capital for the scaling up, needs soft loan from resourceful organizations (CFUGs, MFIs, cooperatives etc) ➤ Untimely delivery and delay in timber supply <p>Price constraint</p> <ul style="list-style-type: none"> ➤ High price of Timber results high price of furniture <p>Others</p> <ul style="list-style-type: none"> ➤ Cannot deliver in time if the demand is high (e.g., offices, restaurants, hotels, etc.) ➤ Load shedding
Individuals who construct furniture on site	<ul style="list-style-type: none"> ➤ Relatively low service charge ➤ Perception of customers who still believe that the furniture will be durable if they purchase the raw materials on their own 	<ul style="list-style-type: none"> ➤ Unorganized in most of the cases
Chinese Furniture Showroom	<ul style="list-style-type: none"> ➤ Elegant and superbly finished ➤ Competitive market ➤ Can meet the mass demand 	<ul style="list-style-type: none"> ➤ Issues of durability is a major constraint ➤ Despite the cost of production is low, the consumer price is very high and thus have limited customers ➤ Number of customers is decreasing now a days due to durability issues

8.4 Employment and income

The furniture industries that are operating at the community level (in the villages), near the road head and at the market centres are still not registered. It has been estimated that more than 100 enterprises are operating at the villages and road heads which are yet to be registered (e.g., Laxmi Furniture at Goglee, Shree Mukta Kamaiya Furniture at Laxmipur, Suman Furniture, etc). Each of these enterprises has generated year round employment for 2-4 individuals (including entrepreneurs themselves) therefore these enterprises are creating employment opportunities to 200 to 400 individuals. They are providing round the year employment at the rate of Rs 6,000 to 7,500 per month. The average annual turnover of such unregistered furniture industries is around Rs. 700,000 to Rs 1,000,000.

The number of registered furniture industries are 208 (CSIDB/DCSI) and in general they are providing employment to around 6 individuals and pay Rs 7,000 to Rs 10,000 per month (by analyzing the 146 furniture enterprises at Pyuthan, Rolpa, Rukum and Salyan). The average annual turnover of these registered furniture industries is around Rs 1,000,000 to Rs 2,000,000.

It can be estimated that the furniture industries at Rapti area is providing employment to more than 2,400 individuals. Based on the scale of operation, they are providing a salary of Rs 6,000 to Rs 10,000 per month with average payment of Rs 8,000 per month.

8.5 Market Segmentation (Demand Side Assessment)

The segmentation of wood furniture has shown that window and door frames are the priority products (despite they are not regarded as furniture in conventional terms), followed by beds (household purpose), cupboards (including kitchen cupboard), chairs, dining table, partition and others. Door and window frames are the major product of most of the rural and community level furniture industries that comprise more than 80% on its segment. With the increasing trend of work migration, there is substantial inflow of money in the villages that attributes the construction of more houses. As a consequence, the demand of frames, beds and cupboards are escalating. Even some saw mills are manufacturing the frames to meet the increasing demand.

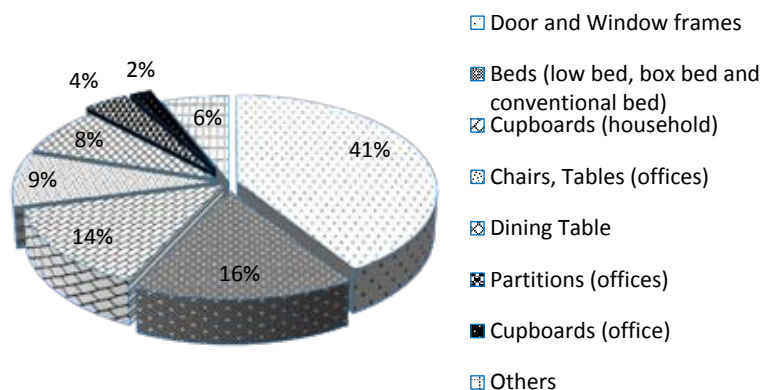


Figure 18: Market segmentation of wood furniture.

Likewise, if the demand is categorised, then two distinct category can be visualized, the furniture for office use and those for household use. It is again evident from the above chart that the demand of furniture for office use in Rapti area is quite low and limited to chairs, tables and cupboards.

8.6 Price segmentation within product

The price segmentation within product given below is based on the consultation with more than two dozens of furniture entrepreneurs. The example is given for simple double bed but the price breakdown for most of the other products is almost similar.

Table 42: Cost Breakdown to manufacture a simple double bed

Particulars	Price	Price breakdown
Salla	3,000	Cost price of the raw materials = Rs 10,500/- (58% on CoP; 52.5% on SP)
Sal	2,000	
Ply, nails, adhesive	3,000	
Purchasing colour	2,500	
Manufacturing cost	5,000	Manufacturing cost = Rs 7,500 (42% on CoP; 37.5% on SP)
Colouring cost	2,500	
Cost of production	18,000	
Profit margin	2,000-4,000	10-20% on selling price
Selling price	20,000-22,000	

It shows that the about 58% of the cost of production (CoP) is required to purchase the raw materials including Timber, ply wood, nails, adhesive, paint, etc. About 42% of the cost of production is required for the labour. It shows that the furniture industries has very good prospects of creating income generating options as about half the investment is retained by the labours. Likewise the profit margin of entrepreneurs ranged from 10- 20%. Furthermore, the price of timber and ply wood (as most of the furniture industries at Rapti area uses Nepalese plywood) is also retained within the country. More than 85% of the cost (except colours, adhesive and nails) is retained within the country therefore furniture industry is contributing to the Gross Domestic Production also.

8.7 Value chain upgrading strategy

The value chain upgrading strategies for furniture is presented considering the six parameters as given in Table 3. These strategies are expected to provide in-depth information for the project to develop action plan for each of the strategy for value chain upgrading in coming times. Value Chain strategy for upgrading furniture value chain is presented as:

8.7.1 End market strategy

End market strategy is prepared to fulfil the gap between market requirements and present status. Spiderogram is used to present the end market strategy. In case of wood furniture, seven parameters were used to prepare spiderogram (Figure 19).

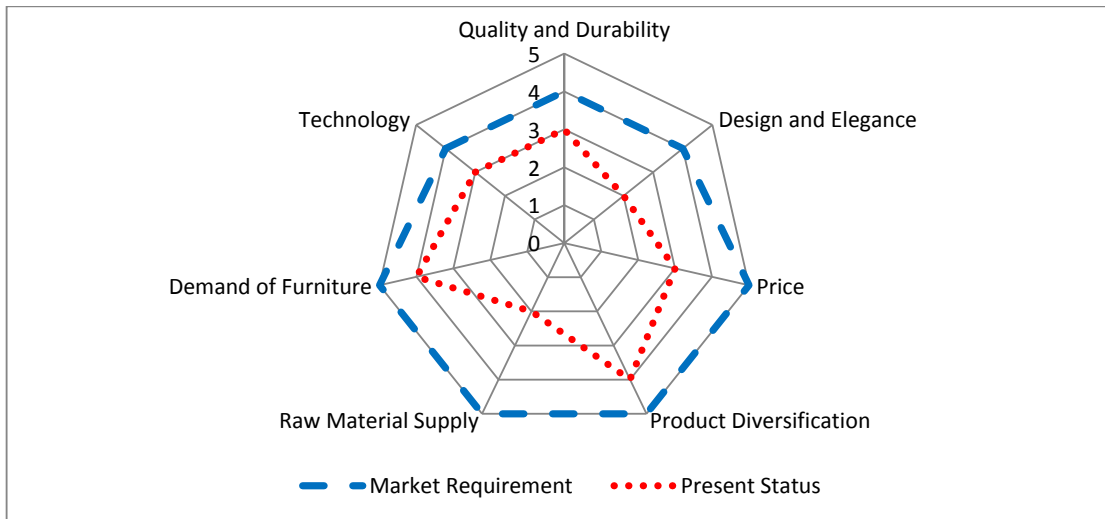


Figure 19: Spiderogram that analyzes market demand and gaps of Furniture Value Chain.

The score ranging from 1 - 5 was given based on the parameters given in the Table 43.

Table 43: Parameters for end market strategy for Furniture Value Chain

Parameters	1	2	3	4	5
Quality and durability	Inferior	Low	Moderate	Good	Excellent
Design and elegance	Inferior	Low	Moderate	Good	Excellent
Price	Worst price negotiation between buyers and sellers	Weak price negotiation between buyers and sellers	Moderate price negotiation between buyers and sellers	Good price negotiation between buyers and sellers	Best price negotiation between buyers and seller

Parameters	1	2	3	4	5
Product Diversification	Single product line	More than two product lines	More than five product lines	More than five product lines with minimization of wastage	More than five product lines with superb quality, durability, design
Raw material supply	Untimely and very limited supply	Untimely and limited supply	Timely but limited supply	Timely and moderate supply	Very good supply in time
Demand of furniture	Very low demand	Low demand	Moderate demand	Good demand	Very good demand
Technology transfer	Traditional Technology with very limited equipments	Traditional technology with limited equipments	Relatively new technology with moderate equipment supply	New technology with modern equipments	Latest technology (seasoning), with modern sophisticated equipments

This implies that the strategy has to be focused on reducing the gaps, mainly in terms of:

a. Gap in Quality and Durability

Locally made furniture are durable but they have quality issues. Their quality is not as per the demand. The labours have to be trained and the entrepreneurs should be taken for exposure visits to ensure the quality.

b. Gap in Design and Elegance

The design and elegance is still not a big concern for rural communities but urban dwellers who have access to the information and exposure look after the designer products. This can be achieved by introducing the new equipments (like sprayer machine for paint), which is already introduced in Kathmandu, Pokhara and Nepalgunj. Training and exposure visits could be effect methods to fulfill this gap.

c. Gap in Price Sensitivity

The price of furniture is very high because of the high price of timber. A strong lobby is required from NGOs, forestry networks/professionals and entrepreneurs for the optimum and sustainable use of timber, that helps to lower the price of timber. Adoption of silvicultural practices by GoN is needed. Harvesting the old and fallen trees for timber production is the only way to decrease price.

d. Gap in Raw Material Supply

Lobby in the joint association of commodity associations, private sectors and NGOs for the timely and adequate supply of timber.

e. Gap in Technology Transfer

Almost all the furniture industries are using the conventional equipments to manufacture the furniture. It is hard to make design in the ply wood. However there are few industries who are using new wood (compressed wood made from fine dust particles, good to make designs), such technology needs to be disseminated in the rural areas as well. Likewise, it is hard to produce elegant furniture with the existing equipments. RN-MSFP could support the entrepreneurs to explore the modern equipments.

8.7.2 Firm level upgrading

Product and process upgrading

The main challenge in process upgrading is to increase the supply of timber at an affordable price. The problem is there because of the government's policy that cuts off supply of timber.

The most important product in furniture value chain was found to be window and door frames and beds followed by cupboards in Rapti area. Use of appropriate technology is crucial for bed and cupboard making. However, there is not any specific requirement of the customers in case of frames as they are general throughout Nepal. There should be the provision of subsidy in tax for the import of machinery equipments for the enterprise upgrading.

Channel upgrading

The market channel of furniture in case of Rapti area generally begins at CFs, GFs or private lands from where the timber is purchased and generally ends in the domestic or regional markets. In general, the market channel for furniture manufactured in Rapti area follows the following routes:

- ♦ Logs collected from CFs, GFs and/or private lands.
- ♦ Saw mills purchase the logs and process to produce the sawn timber.
- ♦ In some cases, the furniture industries themselves purchase the log and make the furniture.
- ♦ Furnitures produced in rural areas are consumed locally, while very few reach to road heads.
- ♦ Furniture manufactured in market centres and road heads are mostly consumed locally or sold at district headquarters.
- ♦ Furniture manufactured in district headquarter are consumed in the headquarters and neighbouring villages.
- ♦ Furniture manufactured in Ghorahi and Tulisipur are mostly consumed locally while some traded to Salyan and/or Pyuthan.

The major hurdle in the channel is the supply of raw material, which can only be addressed

and facilitated by the government. Commodity associations, traders, forestry networks and NGOs have to lobby for the continuous supply of raw materials. The other channels are functioning well and no immediate intervention is needed for other channel upgrading.

Functional upgrading

The major actors in the Furniture Value Chain are as follows and their functional upgrading can be carried out in the following ways.

Table 44: Functional upgrading matrix of Furniture Value Chain

Actors	Present Function	Upgraded Function
Raw material suppliers	DFO and TCN: Sell the logs and timber to the saw mills; CFUGs: Provide logs to their users	Lowering the price of timber: Practive fair auction; CFs should also provide moderate quantity of wood to rural entrepreneurs by amending their OPs (coordination with DFO)
Saw mill owners	Purchase logs from CFs, GFs or private lands and produce sawn timber	Lower the price of timber by minimising the waste
Furniture manufacturers	Community based: Mostly service oriented	Encourage them to manufacture and sell the furniture by purchasing the timber at lower price
	Market centre, Road head based: Both service oriented and product selling	Product diversification and expand the sales up to district headquarter
	District Headquarter based: Both service oriented and product selling	Manufacture designer furniture
	Region based: Mostly product selling, manufacture the furniture either on demand or for stocking	Manufacturr designer furniture; Ensure timely delivery for mass demand

Trans-sectoral upgrading

Currently, the trans-sectoral upgrading is not felt necessary for rural level entrepreneurs because the demand of furniture is high and most of the entrepreneurs and labours have round the year employment. But for the large scale entrepreneurs, the trans-sectoral upgrading can be done with saw mills, veneer and plywood industries.

Inter firm Upgrading

The inter firm upgrading should be carried out in two ways:

- ♦ Formation of alliance between enterprises at regional level for technology upgrading (to be mostly done by big scale entrepreneurs); and
- ♦ Formation of alliance between commodity associations and other concerned stakeholders to upgrade the raw material supply.

8.7.3 Business Development and Financial Service Upgrading

The commercially viable business development services for fulfilling the above service requirements can be catered by:

Table 45: Business services strategies for Furniture Value Chain

Services	Strategy
Raw material supply	<ul style="list-style-type: none">➤ Encourage farmers to cultivate fast growing tree species in their farm lands (long term)➤ Lobby to facilitate the raw material supply
Technology	<ul style="list-style-type: none">➤ Technology transfer to manufacture designer furniture from Kathmandu and other big cities➤ Exposure visit for existing entrepreneurs to adopt new technology➤ Skill upgrading of rural entrepreneurs
Entrepreneurship skills, Business planning and cost benefit analysis	<ul style="list-style-type: none">➤ Provision of entrepreneurship skills, business planning through BDS and CSIDB/DCSI
Value Chain financing	<ul style="list-style-type: none">➤ Provision of loan and subsidy for technology transfer from BDS organizations

8.8 Interventions

The strategies to develop business enabling environment are given as interventions.

8.8.1 Lobby

- ♦ For continuous supply of raw materials.
- ♦ To lower the price of timber by:
 - ❖ Simplifying the auction process.
 - ❖ Encouraging MoFSC for the proper utilization of dead and fallen logs.
 - ❖ Adopting silvicultural practices in the CFs (removal of old/fallen trees and plantation of new seedlings).
 - ❖ Removing the hurdles during transportation.

- ♦ To register the rural enterprises.
- ♦ To abolish or simplify the government rule of 3 km and 5 km.
- ♦ To provide timber to community based furniture industries by amending the CFUG's OP (coordination with DFO, DoF and MoFSC).

8.8.2 Skills and Technology

- ♦ Provide training (first to manufacture frames) to the interested community members.
- ♦ Skill upgrading of existing rural entrepreneurs to make better products.
- ♦ Exposure visits for large scale entrepreneurs to adopt the modern technologies.
- ♦ Explore technology to manufacture designer products.
- ♦ Provide trainings to DAG and women (at least for painting and polishing).

8.8.3 Social

- ♦ Encourage the entrepreneurs to provide employment for skilled women and DAGs (few have already committed to give employment to skilled women).
- ♦ (Long term) Plantation of fast yielding tree species in private lands.

8.8.4 Financial

- ♦ Link the rural entrepreneurs to resource institutions like CFUGs and cooperatives to manage the fund for firm upgrading.
- ♦ Provide seed money/revolving fund to CFUGs or cooperatives, target rural entrepreneurs (both new and existing).

SECTION NINE: VALUE CHAIN ANALYSIS OF SAW MILLS

9.1 Introduction of Saw Mills

A saw mill is generally understood as an industry where logs are sawn into timber. A sawmill's basic operation is much like those of hundreds of years ago; a log enters on one end and timber exits on the other end. Trees are felled and branches are cut off from the trunk. The trunks are cut into the desired length and the logs are transported by trucks to the saw mills. The logs are then debarked and the head saw, head rig or primary saw cuts the log into planks (a stout length of sawn timber; made in a wide variety of sizes and used for many purposes) with smooth edge. Sawmills are all technically similar, consisting of a horizontal band saw with a very simple carriage and a vertical band saw for resawing. Power is supplied either by electricity or by a diesel engine.

The history of Sawmills in Nepal goes back to 1954 with the establishment of Timber Corporation of Nepal (TCN), a semi autonomous body of Government of Nepal (GoN) that had the authority to sell the sawn timber. Therefore, in the initial years, industrial sawmilling was done by TCN and a number of private sawmills. There were 42 TCN sawmills all over the Terai region (in the initial years of TCN's establishment) and 208 private sawmills, half of which were in the Far West. Most of the TCN saw mills and private mills are closed now-a-days due to inadequate supply of raw materials. Inadequate supply of raw materials is therefore the biggest constraint in the development of saw mill industry.

The sawmilling industry supplies sawn timber for construction and for furniture and joinery products, both in rural and urban areas. In some cases saw mill have own furniture industries that manufactures furniture. In other cases, some furniture industries have their own saw to process the logs into sawn timber. But generally Sawmills sell the sawn timber to the furniture industries.

Saw mill is one of the major actors of the value chain of timber based products and it is providing employment and income generating opportunities to the wide range of individuals. Looking at its immense prospects, the Sawmill has been selected as a potential value chain in 10 out of 12 FGDs, experts' consultation and situation analysis. Despite the fact that the Veneer got slightly higher number than the Saw mills, the latter has been selected because it needs lower capital than Veneer factory, can be operated in small, medium and big scale and number of beneficiaries are high compared to that of Veneer (because high number of industries). The current report mainly focuses on the value chain analysis of saw mills in Rapti area.

9.2 Value chain map of saw mills

Figure 20 presents the value chain map of Saw mills in the Rapti area. The figure shows the roles and functions of the actors, their relationships and functions of the enablers.

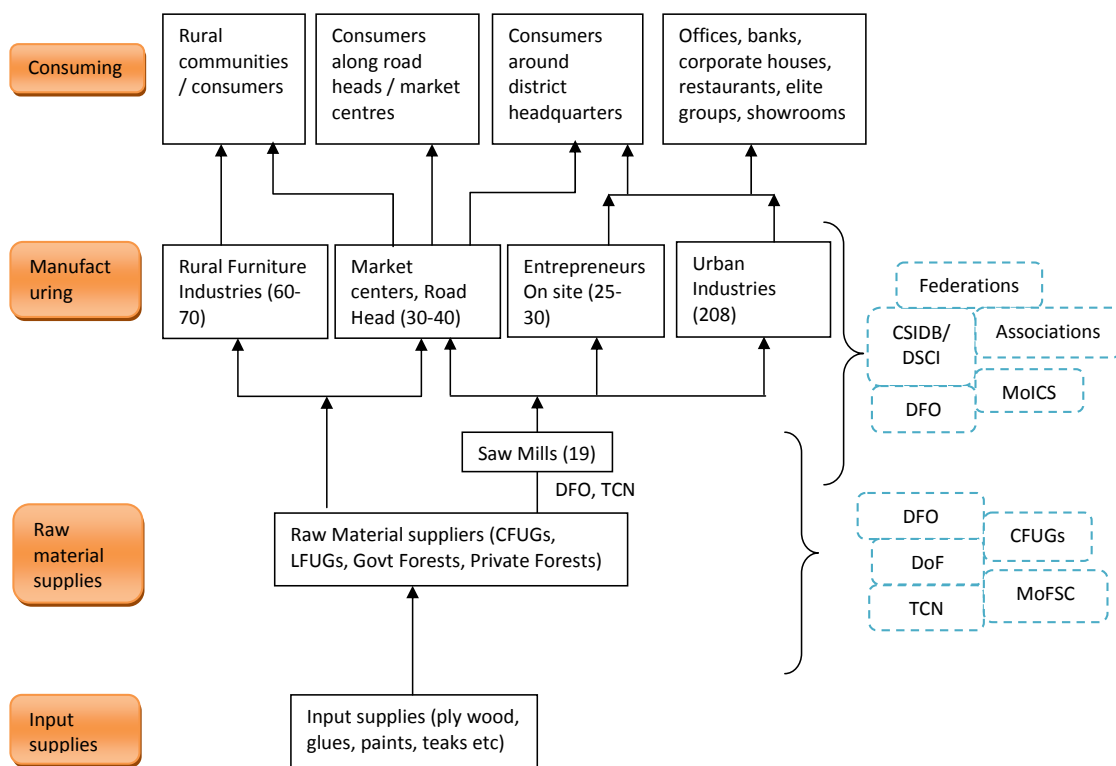


Figure 20: Value Chain Maps of Saw Mills in Rapti Area.

9.2.1 Roles and Functions of the actors and their relationships

There are three tiers of actors viz., micro, meso and macro level actors in Saw mill Value Chain. At the micro level, there are the saw mills themselves of different scales. At the meso level there are CFUGs, LFUGs and private forests owners who provide the logs. At the macro and policy level, there are institutions such as the Cottage and Small Industries Development Board (CSIDB), District Cottage and Small Industries Office (DCSIO), Department of Cottage and Small Industries (DCSI), Ministry of Industry, Commerce and Supplies (MoICS), Timber Corporation of Nepal (TCN), District Forest Offices (DFOs), Department of Forests (DoF) and Ministry of Forests and Soil Conservation (MoFSC) which formulate and implement policy on harvesting of timber and registration of the industry.

Raw Material Suppliers: CFs at community level, Private Forest owners at private level and TCN at the government level are regarded as raw material suppliers (the tree trunks and the logs). CFs have their own provisions to provide the logs to saw mills. CFs, as mentioned in their operational plan, will allocate the timber for its users and some CFs specifically have provisions of harvesting timber. Saw mills purchase timber from CFs with provisions of harvesting timber.

Secondly, private forests are also the source of timber. Private forest owners have to get the permit from DFO to cut the timber.

GFs are the major source of timber for saw mills around the big cities. DFO even has to mention the harvesting of timber in its five years district forestry plan (the District Five Year Plan is approved from DoF). The TCN will collect the old, dead and fallen trees from GFs and auctions them. Saw mill owners either individually or collectively bid at the auctions. If TCN is not available in the district, then DFO takes over the function of selling Timber.

Saw Mills: Logs for saw mills (of all scales) within Rapti Zone are mostly sourced from within the five districts of Rapti zone. Woods of different qualities (Sal, Sissoo, Saj, Kadam, Utis, Salla, etc) are collected from GFs, CFs and private lands. Saw mills then process the logs into timber of different sizes. The timber is then sold to furniture industries. The price of the timber is determined by source and then the quality of the timber. Sal and Jangali Sissoo and Satal are the most valuable timber of all.

In some cases, saw mill themselves manufacture the furniture: mostly door and window frames to diversify their product and to generate additional income.

Furniture Industries: The timber is then purchased by the furniture industries. The roles and functions of the different types of furniture industries are same as that mentioned in the wood furniture value chain therefore it is not discussed here.

Input Suppliers: The input suppliers of saw mills are equipment and machinery suppliers. Saw mills of Rapti area purchases the required inputs either from Nepalgunj, Butawal, Birgunj or from Kathmandu.

9.2.2 Enablers

Then enablers for wood furniture and saw mills are similar therefore it is not repeated here. Please refer to section 8.2.2 for description.

9.3 Opportunities and constraints

The constraints and opportunities at each level are given in the Table 46.

Table 46: Opportunities and constraints of Saw mills in Rapti area

Level	Opportunities	Constraints
Raw material suppliers	<p>CFs:</p> <ul style="list-style-type: none"> ➤ CFs in the lowlands of Rapti have plentiful of forest resources <p>PFs:</p> <ul style="list-style-type: none"> ➤ Availability of private forests <p>GFs:</p> <ul style="list-style-type: none"> ➤ Plenty of old, dead and fallen trees 	<p>CFs:</p> <ul style="list-style-type: none"> ➤ Most CFs can only supply timber to their users ➤ Have no provision to supply timber to saw mills and furniture industries <p>PFs:</p> <ul style="list-style-type: none"> ➤ Hassles to harvest the timber even from own farmland <p>GFs</p> <ul style="list-style-type: none"> ➤ Government's conservative policy ➤ Discretion of officials
Saw mills	<ul style="list-style-type: none"> ➤ Rapti area is rich in forest resources ➤ DFOs of all five districts are preparing the five year District Forestry Plan with provision to harvest with provision of harvesting timber. 	<p>Resource Constraint</p> <ul style="list-style-type: none"> ➤ The uncertainty of the wood supply can be regarded as the major bottleneck to the development of wood-based industries because understandably nobody wants to invest in upgrading or enlargement of facilities unless there is an assured long-term wood supply for the mills. ➤ The price of timber is increasing day by day. The government rate of Sal is Rs 800/ cu.ft. The minimum amount for auction is Rs 1400/cu.ft. by TCN and it is generally auctioned at Rs 2000-Rs2500/ cu.ft. There are other informal fees during transportation. Thus, when the timber reaches to the consumer, its rate is around Rs 4300 - 4500/ cu.ft. for Sal. Thus, hard to manage the timber for saw mills. <p>Policy Constraint</p> <ul style="list-style-type: none"> ➤ Provision of government rule of distance (forest based industries should not be within 3 km from the nearest forest) <p>Others</p> <ul style="list-style-type: none"> ➤ Load shedding

9.4 Employment and income

There are a total of 19 registered saw mills in Rapti area, most of them are situated in Ghorahi, Lamahi and Tulispur. Each of these saw mills are providing full time employment to 12 individuals in average and about 15 part time employments. Each of the full time workers receives an average salary of Rs 12,000 - 15,000 per month, totalling of Rs 144,000 - 180,000 per year. Each of these 19 registered saw mills has the capital of more than 10 million rupees. Likewise, the part time skilled labour get Rs 1,000 per day and unskilled labours were paid an average of Rs 350/day. Thus, the registered saw mill industries of Rapti area are providing full time employment to about 230 persons.

Likewise, there are number of saw mills in rural village areas that are yet to be registered. Generally, these industries cut the log into timber and most of these industries have own furniture factories. They are providing employment opportunities for five individuals per saw mills.

Once milled, timber is sold at different rates.

- ♦ Sal is sold at Rs 4,300 - 5,000/ft³
- ♦ Jungali Sissoo is sold at Rs 4,200 - 4,500/ft³
- ♦ Special Sissoo is sold at Rs 3,000 - 3,500/ft³
- ♦ Ordinary Sissoo is sold at Rs 2,000 - 2,200/ft³
- ♦ Saj is sold at Rs 2,000 - 2,200/ft³
- ♦ Salla is sold at Rs 1,200 - 1,500/ft³

9.5 Value chain upgrading strategy

The value chain upgrading strategies for saw mill is presented considering the six parameters as given in Table 3. These strategies provide in-depth information to develop action plan for each of the strategy for value chain upgrading in coming times. Value Chain strategy for upgrading saw mill value chain is presented as:

9.5.1 End market strategy

End market strategy is prepared to fulfil the gap between market requirements and present status. Spiderogram is used to present the end market strategy. In case of Saw mills, five parameters were used to prepare spiderogram (Figure 21).

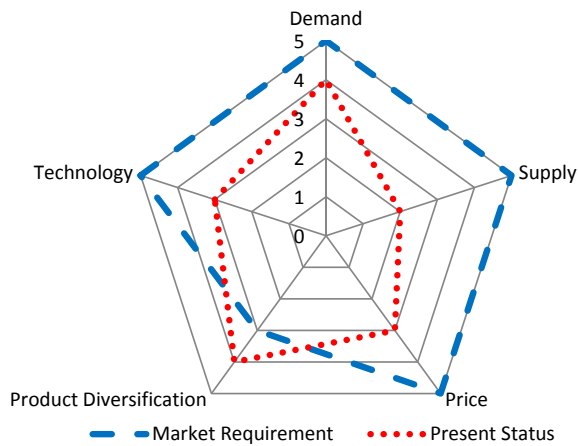


Figure 21: Spiderogram to analyze market demand and gaps for Saw mill Value Chain.

The score ranging from 1 - 5 was given based on the parameters given in the Table 47.

Table 47: Parameters for end market strategy for Saw mill Value Chain

Parameters	1	2	3	4	5
Demand (from demand side)	Very low demand	Low demand	Moderate demand	Good demand	Very good demand
Supply (from raw material suppliers)	Untimely and very limited supply	Untimely and limited supply	Timely but limited supply	Timely and moderate supply	Very good supply in time
Price (for demand and supply side)	Very high price that is hard to afford	High price and have limited customers	Moderate price	Affordable price	Affordable price for quality timber and furniture
Product Diversification	Timber of only one type	Timber of 2-5 types	Timber of more than 5 types	Timber of more than 5 types with few other products	Timber of more than 5 types with lots of other products
Technology transfer	Traditional Technology with very limited equipments	Traditional technology with limited equipments	Relatively new technology with moderate equipment supply	New technology with modern equipments	Latest technology (seasoning), with modern sophisticated equipments

This implies that the strategies have to be focused towards improving the supply of raw material, reducing the price of raw material and making latest technology easily available.

a. Gap in demand and supply

The demand of timber from furniture industries is very high but the supply from Saw mill is very low because of the limited supply of timber from CFs, PFs and GFs. This gap can be minimized by lobbying and amending the OPs of CFs.

b. Gap in Price

The price of the timber is very high. The auction rate is Rs 1,400 (for round logs) and the customer rate is around Rs 4,500 (sawn timber in case of Sal). The price needs to be reduced for the sustainability of the saw mills and furniture industries.

c. Technology

Almost all the saw mills are using the conventional blades and equipments. Technological advancement and optimizing the use (round the clock work) of these technologies will help to decrease the production cost.

9.5.2 Firm level upgrading

Demand side upgrading

Furniture industries are the stakeholders at the demand side. As mentioned in the previous section on value chain analysis of furniture, there are more than 300 furniture industries and they are always in shortage of the timber. As a result, some big furniture industries have diversified their income by selling the aluminum frames, indicating that the demand side is always ready to purchase the timber from Sawmills.

Process and Product Upgrading: The main challenge in process upgrading is to increase the supply of clear timber at an affordable price. The problem is there because of the government's rule (the government focuses on conservation rather than sustainable and scientific management of the foerests) that cuts off supply of timber.

Ideally, saw mills are meant to produce sawn timber from logs. Most of the saw mills are supplying the timber that is mostly coarse (i.e. without finishing). The timbers are used by furniture industries which perform further processing. Therefore, the product (sawn timber) does not need upgrading at least in the current situation.

Channel upgrading

The market channel of saw mill is very simple. The logs are transported from different site (CFs, PFs, GFs, etc.) and the sawn timber are purchased by the furniture industries. The major hurdle in the channel is the supply of raw material, which can be addressed only by the government. Commodity associations, traders, I/NGOs and bilateral aid agencies have to lobby for the continuous supply of raw materials.

The provision of multiple taxation system, informal fees and “chulthe-mundre” are another hurdles that needs to be addressed. It can be upgraded by institutionalizing the trade. Further, political stability is most to upgrade the channel. The other channels (i.e. from Saw mill to furniture industries) are functioning well and no immediate intervention is needed.

Functional upgrading

The major actors in the Saw mill value chain are as follows and their functional upgrading can be carried out in the following ways.

Table 48: Functional upgrading matrix for Saw mill Value Chain

Actors	Present Function	Upgraded Function
Raw material suppliers	TCN and DFO (At present TCN service is not available): Sell the logs and timber mostly to the saw mills and sometimes to others	Lowering the price of timber: practice fair auction; Enhanced and optimized use of old, dead and fallen trees; CFs should also provide moderate quantity of wood to rural entrepreneurs by amending their OPs (coordinating and after getting the approval from DFO)
	CFUGs: Provide logs to their users	
Transporters	Transport the logs from site to the saw mills	No upgrading is needed
Saw mill owners	Saw mills at Ghorahi, Lamahi, Tulsipur: Purchase logs from CFs, GFs or private lands and produce sawn timber	Lower the price of timber by minimising the waste; Optimized use of by-products; Encourage saw mills to buy the logs and sell the timber rather than giving the services
	Small scale saw mills (at villages or market centres): Collect the logs from CFs or private lands and produce sawn timber	
Furniture manufacturers	Community based: Mostly service oriented	Encourage them to manufacture and sell the furniture by purchasing the timber at lower price
	Market centre, Road head based: Both service oriented and product selling	Product diversification and expand the sales up to district headquarter
	District Headquarter based: Both service oriented and product selling	Manufacture designer furniture
	Regional based: Mostly product selling, manufacture the furniture either on demand or for stocking	Manufacture designer furniture; Ensure timely delivery for mass demand

Trans-sectoral upgrading

Trans-sectoral upgrading for saw mills can be done with the furniture industries.

Inter-firm upgrading

The interfirm upgrading is felt necessary to ensure the continuous supply of raw materials. Likewise, there should be alliance between the saw mills at regional level for technology upgrade. It can be done by saw mills which have own furniture industries and bring the new technology (such as seasoning machine, computerized sawing machine, etc).

9.5.3 Business development and financial service upgrading

The commercially viable business development services for fulfilling the above service requirements can be catered by:

Table 49: Business services strategies for Saw mill Value Chain

Services	Strategy
Raw material supply	<ul style="list-style-type: none">➤ Encourage farmers to cultivate fast growing tree species in their farm lands (long term)➤ Lobby to ensure the sustainable supply of raw materials from GFs
Policy	<ul style="list-style-type: none">➤ Regulate the price of Timber➤ A circular or law or regulation from government of Nepal to ensure the sustainable supply of raw materials by adopting scientific forest management➤ Abolish or simplify the government rule of 3 km and 5 km by continuous lobbying➤ Amend in the CFs statute and OPs to provide the Timber for community based industries
Technology	<ul style="list-style-type: none">➤ Technology transfer to introduce new machineries and equipments that are more efficient, minimizes the loss and cut timber of different sizes. It can be done by organizing exposure visits of the existing entrepreneurs.
Entrepreneurship skills, Business planning and cost benefit analysis	<ul style="list-style-type: none">➤ Provision of entrepreneurship skills, business planning through BDS and CSIDB/DCSI
Value Chain financing	<ul style="list-style-type: none">➤ Provision of loan for technology transfer➤ Provision of loan for factory upgrade

9.6 Interventions

Above strategies can provide following immediate and short term interventions in a nutshell.

9.6.1 Lobby

- ♦ For the continuous supply of raw materials.
- ♦ To lower the price of timber by
 - ❖ Simplifying the auction process.
 - ❖ Encouraging MoFSC for the proper utilization of dead and fallen logs.
 - ❖ Adopting silvicultural practices in the CF (removal of old/fallen trees and plantation of new seedlings).
 - ❖ Removing the hurdles during transportation.
- ♦ To simplify the government rule of 3 km and 5 km.
- ♦ To provide timber to community based furniture industries by amending the CF OPs, lobbying at DFO, DoF and MoFSC.

9.6.2 Skills and technology

- ♦ Introduction of efficient sawing machine that has maximum output with minimum loss and maximum sawn timber yield.
- ♦ Exposure visit to the existing large scale saw mills to introduce seasoning machine.

9.6.3 Social

- ♦ Encourage the entrepreneurs to provide employment to DAGs.
- ♦ Plantation of fast yielding tree species in private lands (long term)

9.6.4 Financial

- ♦ Provision of loan for technology transfer.
- ♦ Provision of loan for factory upgrade.

PART TEN: SHARING, PLANNING AND IMPLEMENTATION

10.1 Sharing Workshop

Sharing workshops were organized at Liwang (Rolpa); Khalanga (Pyuthan); Musikot (Rukum); Khalanga (Salyan); and Ghorahi (Dang). The objectives of the sharing workshops were to share the outcomes of the VCA, get the consensus, get the suggestions and prepare action plan to implement the findings of the VCA.

Following are the major outputs of the sharing workshops:

- ♦ Action plan for the upcoming activities as per the findings of the VCA was prepared in all five districts. The products and places within the districts were selected, activities were identified and responsible agencies were identified in consensus of all the concerned stakeholders.
- ♦ Sharing workshop at Liwang identified Timur, Allo, Chiuri and Furniture as the most viable products (in line with value chain findings) to achieve the outcome 2 of MSFP. The workshop formulated a group led by DCCI chairman to assess the possibilities of distilling Zanthoxylum oil and prepared a one year action plan. Likewise, the workshop decided to promote Allo and upgrade the existing Kols for Chiuri processing.
- ♦ Likewise, workshop at Pyuthan, Khalanga identified Furniture, Allo thread and cloth, handmade paper and honey as the most promising forest based products and prepared action plans in line with the findings of the VCA. The workshop also emphasized the need of large scale extension of bee keeping in selected pocket areas of Pyuthan district.
- ♦ Similarly, sharing workshop at Salyan Khalanga identified Timur and Chiuri as the most promising forest based products. The focus, however, was on the raw trade of Timur and ensuring the benefit of the collectors/farmers. The workshop also emphasized the need of assessing the economic potentiality of Tejpat (*Cinnamomum tamala*) and recommended for appropriate future interventions viz., cultivation and distillation of Cinnamon oil. Likewise, the workshop emphasized the promotion of Chiuri ghee in Kalimati area.
- ♦ Sharing workshop at Musikot (Rukum) identified Chiuri, Timur, Honey and Essential oil as the potential non timber forest products and Furniture as the potential timber based forest based product. The workshop emphasized the need to strengthen the existing Chiuri soap enterprise and to install Timur grading machine. The workshop also identified essential oil as potential sector and recommended the further assessment of the essential oil sector.
- ♦ The sharing workshops did not make any explicit planning but emphasized to add Honey and Essential oil along with other identified NTFPs and furniture. The workshops further recommended RN-MSFP to play a catalytic role in addressing the policy issues in regards to timber based industries.

The key way forwards recommended by the sharing workshops were:

1. Mainstreaming the activities identified during joint workshop in the annual work plan of concerned stakeholders, that is in line with the value chain report.
2. Prepare detailed action plan and support/operation modality for RN-MSFP and concerned stakeholders.
3. Finally, make a roadmap to add more investment and employment opportunities and materialize the roadmap with the consensus of all concerned stakeholders.

10.2 Capacity Building

RN-MSFP field staffs have to facilitate the preparation of business plans of the proposed and the existing enterprises because the business plans are crucial to guide the proposed and existing enterprises. For this a four day training was organized at Tulsipur, Dang. A total of 19 in-house staffs of RN-MSFP participated in the training. The training was divided into two parts: value chain analysis and business plan development. The first part of the training (value chain analysis) covered definition of the value chain; process of value chain analysis; sharing of the findings of value chain analysis; group work to identify the value chain, preparation of the spiderogram and SWOT analysis. The second part of the training (business plan development) focused on preparation of the business plan i.e., concept of business plan; group work and preparation of the business plan. The training is expected to be helpful to RN-MSFP in-house staffs to implement the programme activities at field level and to achieve the programme outputs. The training schedule is presented in Annex 11.

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Annexes

Annex 1. Free listed NTFPs of five districts (in alphabetical order).

Free Listed NTFPs				
Salyan	Rukum	Pyuthan	Rolpa	Dang
Amala	Allo	Aloe vera	Allo	Allo
Amriso	Amala	Amala	Amala	Aloe vera
Ban gava	Attis	Amliso	Bark of Chutro	Amala
Bans	Bhang	Bamboo	Bark of Kafal	Ashwoganda
Bee Farming	Bikhma	Banmara	Bhimal Rope	Asuro
Bel	Bojho	Barro	Bojho	Bael
Chiraito	Chiuri	Bhakimlo	Chiraito	bajradanti
Chutro	Chutro	Bhorlako paat	Chiuri	Barro
Chyuri	Dalchini	Bhutkesh	Dalvhini/Tejpat	Bhakimlo
Dalchini	Honey	Bhyakur	Jatamasi	Bhringraj
Gittha	Honey (wild)	Bojho	Kaulo	chamomile
Jhyau	Kaulo	Chayu	Kutki	Chirayito
Kakarsingi	Khoto	Chiraito	Lampate	Chiuri
Kaulo	Kurilo	Chiuri	Malagedi	Chutro
Keura	Kutki	Chutro	Padamchal	Citronella
Khoto	Lauth salla	Dalchini	Pakhanbed	Dalchini
Kurilo	Lemon grass	Githha	Resin	Damar Belwar
Laligurans	Lokta	Harro	Ritha	Ghodtapre
Malkakno	Malagedi	Jatamasi	Samayo	Gurjo
Aloe vera	Chiraito	Allo	Timur	Handicraft (Bamboo)
Nigalo	Mentha	Kaulo		Harro
Okhar	Nigalo	Khoto		Honey
Orchids	Okhar	Kurilo		Kalmegh
Pakhanbed	Padamchal	Kyatuke		Kaulo
Rittha	Pakhanved	Laaligurans		Khayar
Samayo	Pursa Dyammur	Leaves(Sal)		Khoto
Silpu	Rato chyau	Lekhpaangra		Kurilo
Sisnu	Rittha	Lokta		Leaf plate

Free Listed NTFPs				
Salyan	Rukum	Pyuthan	Rolpa	Dang
Supha	Rosemerry	Malagedi		Lemon grass
Tare	Samayo	Musali		Lokta
Tejpat	Satuwa	Neem		Malagiri
Timur	Silparo	Nigalo		Mehendi
	Simal	Okhar		Mentha
	Sisnoo	Paakhanbedh		Neem
	Timur	Paanchaaule		Okhar
	Titepati	Padamchal		Pakhanved
		Rakte mula		Pipla
		Rato Chyau		Rittha
		Ritha		Rudilo
		Saijwan		Sal leaf
		Samayo		Salla Khoto
		Satuwa		Samayo
		Shrikhanda		Sarpagandah
		Sisno		Sisnoo
		Sunakhari		Soijan
		Timur		Timur
		Titepati		Titepati
				Yarsagumba

Annex 2. Free listed Timber products of five districts (in alphabetical order).

Free Listed Timber Products				
Salyan	Rukum	Pyuthan	Rolpa	Dang
Furniture	Furniture	Furniture	Furniture	Furniture
Saw mill	Saw mill	Saw-Mill	Saw mill	Saw mill
Veneer	Bee hive	Bee hive	Handicraft	Veneer
	Musical instruments	Handicraft	Veneer	Handicraft (wood)
	Agricultural equipments	Timber		
	Handicrafts			
	Veneer			

Annex 3. Attractiveness matrices by districts/market centres

Holeri, Rolpa

Number of beneficiaries	High	Chiraito, Vimal Rope	Sisno	Timur, Resin, Saw mill
	Medium		Malagedi, Dalchini, Bojho, Allo, Bamboo handicraft, Lampate	Furniture
	Low	Pakhanbed, Kurilo, wooden handicrafts	Ritha, Kaulo, Amala	Samayo
		Low	Medium	High
Prospects of investment				

Sulichaur, Rolpa

Number of beneficiaries	High		Timur	Allo, Resin, Saw mill, Veneer
	Medium	Amala, Pakhanbed	Chiuri, Kaulo, Ritha, Dalchini	Furniture
	Low	Bojho	Chiraito, Samayo	
		Low	Medium	High
Prospects of investment				

Liwang, Rolpa

Number of beneficiaries	High			Timur, Allo, Furniture, Sawmill veneer, Resin
	Medium	Sisno, Kaulo	chiraito, Dalchini, Lokta, Samayo, Lokta, Chiuri	
	Low	Kutki, Okhar	Pakhanbed	
		Low	Medium	High
Prospects of investment				

Baddanda, Pyuthan

Number of beneficiaries	High		Leaves(Sal), Handicraft	Chiuri, Furniture, Honey bee, Bee hive
	Medium	Harro, Barro, Amala, Githha		Dalchini, Timur
	Low	Malagedi	Rithha, kurilo	
		Low	Medium	High
Prospects of Investment				

Bahane, Pyuthan

Number of beneficiaries	High		Nigalo, Bamboo	Allo, Furniture
	Medium		Timur, Sisno	Lokta, Rato Chyau, Khoto
	Low	Bee hive		
		Low	Medium	High
Prospects of Investment				

Khalanga: Pyuthan

Number of beneficiaries	High		Amriso	Chiuri, Furniture, Sisno powder, Saw mill, Veneer, Dalchini
	Medium		Tapari	Bamboo, Nigalo
	Low			
		Low	Medium	High
Prospects of Investment				

Salli Bazar, Salyan

Number of beneficiaries	High		Tejpat/Dalchini, Gittho, Kaulo	Timur, Khoto, Furniture, Saw-Mill, Veneer
	Medium	Chutro, Chyuri	Rittha	
	Low	Silpu, Bangava		Kakarsingi
		Low	Medium	High
Prospects of investment				

Tharmare, Salyan

Number of beneficiaries	High		Timur, Bans	Khoto, Furniture, Saw-Mill, Veneer
	Medium			Chiraito, Okhar
	Low	Rittha, Amala	Laligurans	
		Low	Medium	High
Prospects of investment				

Khalanga, Rukum

Number of beneficiaries	High	Pine Resin	Allo, Nigalo	Kurilo, Lokta, Satwua, Furniture, Bet/Bans, Nigalo, Saw mill, Bikhma
	Medium	Rittha	Timur, Theki, Chiuri, Musical instruments	Honey, Bee hive, Agricultural accessories, Kuto, Kodalo
	Low	Chirayito, Bojho, Dalchini, Kutki, Sisnoo, Rato chyau	Padamchal, Okhar	
		Low	Medium	High
Prospects of investment				

Solabang, Rukum

Number of beneficiaries	High	Allo	Dalchini, Silparo, Rosemerry	Timur, Padamchal, Furniture, Bans, Nigalo, Veneer
	Medium		Kurilo, Satuwa, Kutki, Chiuri	Chiraito
	Low		Amala	
		Low	Medium	High
Prospects of investment				

Ghorahi, Dang

Number of beneficiaries	High		Amala, Harro, Barro, Allo	Chiuri, Pine Resin, Kaulo, Timur, Furniture, Veneer, Saw mill
	Medium		Samayo, Malagiri, Bael	Dalchini
	Low	Sisnoo, Okhar, Rittha, Kurilo		
		Low	Medium	High
		Prospects of investment		

Lamahi, Dang

Number of beneficiaries	High	Rope		Essential oils. Pipla, Mehendi, Veneer, Saw mill, Furnitures
	Medium	Amala	Neem, Handicraft	
	Low	Kurilo, Sarpagandha, Gurjo, Bhringraj	Bael	Bans, Tapari (from sal leaf)
		Low	Medium	High
		Prospects of investment		

Annex 4. Ranking matrices by districts/market centres

Holeri, Rolpa

Category →	Timber		NTFPs								
Generic criteria ↓	Saw mill	Furniture	Timur	Rosin	Lampate	Sisno	Malagedi	Dalchini	Bojho	Allo	Bamboo Handicrafts
Prospects of employment	5	4	5	5	3	4	3	3	3	2	4
Prospects of investment	4	5	5	5	3	4	4	3	4	2	4
Market price	5	3	4	3	2	3	4	4	3	5	5
Market Demand	5	5	5	5	4	2	4	4	3	3	5
Availability of resources	5	5	5	4	3	5	4	4	2	4	5
Technical knowledge	3	3	2	5	2	2	5	2	2	2	3
Local interest	5	4	5	4	2	4	5	4	4	3	4
Possibility of Value addition	4	4	4	3	3	4	4	4	4	4	4
Total weight	36	33	35	34	22	28	27	28	25	25	34
Category wise ranking	I	II	I	II	VI	III	IV	III	V	V	II

Sulichaur, Rolpa

Category →	Timber			NTFPs						
Generic criteria ↓	Saw mill	Furniture	Veneer	Timur	Allo	Resin	Kaulo	Dalchini	Chiuri	Ritha
Prospects of employment	4	4	4	4	4	4	3	3	3	3
Prospects of investment	4	4	4	4	4	4	3	3	3	3
Market price	4	4	4	4	3	3	3	2	3	2
Market Demand	4	4	3	4	4	4	4	4	3	4
Availability of resources	4	4	4	4	4	3	3	2	3	2
Technical knowledge	3	3	2	3	3	2	2	2	2	3
Local interest	3	3	2	4	4	3	3	3	2	2
Possibility of Value addition	4	4	4	3	4	3	2	2	3	3
Total weight	30	30	27	30	30	26	23	21	22	22
Category wise ranking	I	I	II	I	I	II	III	V	IV	IV

Liwang, Rolpa

Category →	Timber			NTFPs							
Generic criteria ↓	Furniture	Sawmill	veneer	Timur	Allo	Chiraito	Dalchini	Samayo	Lokta	Chiuri	Resin
Prospects of employment	4	4	4	4	4	3	3	3	3	3	4
Prospects of investment	4	4	4	4	4	3	3	3	3	3	4
Market price	4	4	4	3	4	4	4	4	4	4	4
Market Demand	4	4	4	4	4	4	4	4	3	4	4
Availability of resources	3	3	3	4	4	3	3	2	3	3	4
Technical knowledge	3	3	2	4	3	2	3	3	2	2	3
Local interest	4	4	3	4	4	3	3	3	3	3	3
Possibility of Value addition	4	4	4	3	4	2	2	3	4	4	3
Total weight	30	30	28	30	31	24	25	25	25	26	29
Category wise ranking	I	I	II	II	I	VI	V	V	V	IV	III

Baddanda, Pyuthan

Category →	Furniture	Others			NTFPs			
Generic criteria ↓	Furniture	Handicraft	Honey	Bee Hive	Chiuri	Dalchini	Timur	Leaf Plate (sal)
Prospects of employment	5	3	4	4	5	3	3	4
Prospects of investment	5	3	4	4	4	3	3	3
Market price	5	3	4	4	4	3	3	1
Availability of resources	3	5	5	3	5	3	3	5
Market Demand	5	3	4	5	5	5	3	1
Technical knowledge	3	2	4	4	3	3	2	2
Local interest	4	3	4	4	5	3	3	3
Possibility of Value addition	3	4	3	4	4	3	4	2
Total weight	33	26	32	32	35	26	26	21
Category wise ranking	I	II	I	I	I	II	II	III

Bahane, Pyuthan

Category →	Furniture	Others	NTFPs						
Generic criteria ↓	Furniture	Bee hive	Khoto	Rato chyau	Lokta	Nigalo/Bans	Allo	Timur	Sisnoo Powder
Prospects of employment	4	3	2	4	4	3	5	2	3
Prospects of investment	5	3	3	4	4	2	5	3	2
Market price	5	4	2	4	4	2	4	4	3
Availability of resources	2	2	4	1	5	4	4	3	4
Market Demand	5	4	4	4	4	4	4	4	2
Technical knowledge	3	2	2	1	3	2	4	3	2
Local interest	5	3	2	3	4	4	5	3	3
Possibility of Value addition	5	4	3	4	4	4	5	4	4
Total weight	34	25	22	25	32	25	36	26	23
Category wise ranking	I	I	VI	IV	II	IV	I	III	V

Khalanga, Pyuthan

Category →	Furniture			NTFPs					
Generic criteria ↓	Furniture	Veneer	Saw mill	Amriso	Dalchini	SIsnoo powder	Leaf Plate (Sal)	Bans/ Nigalo	Chiuri
Prospects of employment	5	4	4	5	4	4	3	4	4
Prospects of investment	4	4	4	4	4	3	3	4	3
Market price	5	4	4	5	5	4	3	3	4
Availability of resources	3	3	3	2	2	5	5	5	3
Market Demand	5	4	5	5	5	3	3	4	3
Technical knowledge	2	1	3	3	3	2	4	3	2
Local interest	4	3	3	4	5	3	4	4	3
Possibility of Value addition	4	4	4	4	5	4	3	4	4
Total weight	32	27	30	32	33	28	28	31	26
Category wise ranking	I	III	II	II	I	IV	IV	III	V

Salli Bazar, Salyan

Category →	Timber			NTFPs						
Sub sectors →	Furniture	Saw-Mill	Veneer	Timur	Khoto	Tejpat	Dalchini	Gittho	Kaulo	Rittha
Generic criteria ↓										
Opportunity of Employment Generation	5	5	5	4	5	4	4	4	5	3
Prospect of Investment	5	5	5	4	5	3	3	3	3	3
Market Price	5	3	3	4	4	2	2	3	4	2
Market Demand	5	5	5	5	5	4	4	4	5	2
Resource Availability	3	2	4	3	3	3	3	2	2	3
Technical Know How	2	1	1	2	3	2	2	1	1	1
Locals Interest	5	5	4	5	5	4	4	2	3	4
Prospect of Value Addition	5	3	3	5	2	2	2	2	4	2
Total weight	35	29	29	32	32	24	24	21	27	20
Category wise ranking	I	II	II	I	I	III	III	IV	II	V

Tharmare, Salyan

Category →	Timber			NTFPs				
Sub sectors → Generic criteria ↓	Veneer	Furniture	Sawmill	Khoto	Timur	Bans Products	Chiraito	Okhar
Opportunity of Employment Generation	5	5	4	5	5	5	2	3
Prospect of Investment	5	5	5	5	3	3	4	4
Market Price	4	5	4	4	2	3	5	4
Market Demand	5	5	4	5	3	4	5	4
Resource Availability	4	5	4	5	5	5	2	3
Technical Know How	2	3	4	3	2	4	2	3
Locals Interest	4	4	4	4	5	3	4	4
Prospect of Value Addition	3	4	3	3	4	2	4	4
Total weight	32	36	32	34	29	29	28	29
Category wise ranking	II	I	II	I	II	II	III	II

Khalanga, Rukum

Category →	Timber					NTFPs								
Generic criteria ↓	Furniture	Saw Mill	Bee Hive	Musical Instruments	Agricultural instruments	Allo	Nigalo	Timur	Kurilo	Lokta	Satuwa	Honey	Chiuri	Blkhma
Prospects of employment	5	4	3	2	3	4	3	2	4	4	4	3	3	2
Prospects of investment	5	4	4	3	4	3	3	3	4	4	4	4	3	3
Market price	4	4	4	4	3	4	4	3	4	5	5	4	4	4
Availability of resources	5	4	4	4	4	4	4	4	5	5	5	5	4	4
Market Demand	3	3	4	4	4	3	5	2	2	3	1	3	3	1
Technical knowledge	4	3	2	2	3	4	2	2	2	2	2	3	2	2
Local interest	4	3	4	3	4	5	3	3	4	4	4	4	4	3
Possibility of Value addition	3	4	4	4	3	4	4	3	4	4	5	4	4	4
Total weight	33	29	29	26	28	31	28	22	29	31	30	30	27	23
Category wise ranking	I	II	II	IV	III	I	IV	VII	III	I	II	II	V	VI

Solabang, Rukum

Category →	Timber			NTFPs									
Generic criteria ↓	Furniture	Veneer	Bans/Nigalo	Dalchini	Silparo	Rosemerry	Timur	Padamchal	Chiraito	Chiuri	Kutki	Satuwa	Kurilo
Prospects of employment	5	5	4	4	4	4	5	4	3	3	3	3	3
Prospects of investment	5	5	3	3	3	3	4	4	4	3	3	3	3
Market price	4	4	4	4	4	4	3	3	4	3	5	5	3
Availability of resources	4	4	4	5	4	5	5	4	5	3	5	5	3
Market Demand	5	5	5	3	3	3	3	4	2	4	2	1	3
Technical knowledge	3	2	3	1	1	2	1	1	1	2	1	1	1
Local interest	4	4	4	2	3	4	2	4	4	3	4	5	2
Possibility of Value addition	4	4	4	4	4	4	3	3	5	4	5	5	3
Total weight	34	33	31	26	26	29	26	27	28	25	28	28	21
Category wise ranking	I	II	III	IV	IV	I	IV	III	II	V	II	II	VI

Ghorahi, Dang

Category →	Timber			NTFPs						
Generic criteria ↓	Furniture	Saw mill	Veneer	Amala, Harro, Barro	Allo	Chiuri	Khoto	Kaulo	Timur	Dalchini
Prospects of employment	5	5	4	4	4	4	5	3	4	3
Prospects of investment	5	5	5	2	3	4	5	4	5	3
Market price / demand	5	5	5	3	5	4	5	5	4	4
Availability of resources	5	4	4	3	3	5	4	3	5	3
Technical knowledge	4	4	2	3	2	3	4	3	3	2
Local interest	5	5	3	2	4	4	2	4	4	4
Possibility of Value addition	5	5	5	4	5	4	3	3	5	3
Total weight	34	33	28	21	26	28	28	25	30	22
Category wise ranking	I	II	III	VI	III	II	II	IV	I	V

Lamahi, Dang

Category →	Timber			NTFPs				
Generic criteria ↓	Furniture	Veneer	Saw mill	Essential Oil	Pipla	Mehendi	Neem	Handicraft
Prospects of employment	5	4	4	4	2	4	2	3
Prospects of investment	4	4	4	4	3	4	2	3
Market price / demand	5	5	5	4	4	4	2	4
Availability of resources	4	4	4	5	3	4	2	5
Technical knowledge	4	3	4	4	2	4	2	2
Local interest	4	3	3	5	2	4	2	3
Possibility of Value addition	4	4	4	5	3	5	2	4
Total weight	30	27	28	31	19	29	14	24
Category wise ranking	I	III	II	I	IV	II	V	III

Cultivation Technique

Propagation by Seeds:

Seeds collected on late October-November are dried in shade. Healthy and large red fruits are selected and collected for seedling purpose. A homogenous mixture of 1/3 part compost manure, 1/3 part soil and 1/3 part forest soil (about 8cm thick) is placed in nursery beds. Seeds are pretreated with cold running water for 24 hours to stimulate germination. Pretreated seeds are sown in nursery beds during March-April and a layer of straw or hay is placed over nursery bed. The beds are watered in alternate days to maintain the moist condition and for better germination. Regular weeding is needed otherwise the weeds retards the germination of concerned plant. Seed starts germinating in 3-4 months of sowing. These seedlings are generally transferred in plastic polybags or left as such in the nursery beds. However, seedlings from densely germinated area must be transplanted to polybags. Seedlings can be transplanted to field after 6-10 months, or attaining a height of 15-20cm. As Timur is a spreading dense shrub, 2-3m distance between two plants has to be maintained.

Propagation by Stem Cuttings:

Timur can be propagated vegetatively by cuttings of mature stems. Thumb sized cuttings with at least three nodes (of about 15 cm length) are cut during March-April and planted in nursery beds or polybags. For easy rooting, base of stem is dipped in 2-3% rootex solution. Of the three nodes, two are laid below the soil level and one node is exposed outside. Nursery beds are covered with plastics to maintain soil temperature for quick rooting. Root appears in March-April and the cuttings are ready to plant in July-August after attaining 15-20cm height.

About 5 tons of compost manure is required for cultivation of Timur in one hectare area. About 1000 seedlings (either borne from seeds or from stem cuttings) are planted in a hectare. Weeding is done 2-3 times for first year, with additional compost manure. The plant starts flowering and fruiting from third to fourth year and continue to yield for next 20 years. About 3500 kg of Timur are produced in a hectare in general (3.5 kg yield per plant) but the quantity may vary.

Sustainable Management

Harvest time and method:

It is recommended to harvest the fruits from at least 3-4 years old plant during October to late November. Collection during this time will ensure the higher oil content in fruits. The optimum time for harvesting is indicated biologically by falling off the fruits to the ground. Hand picking harvesting should be encouraged for sustainable production. The fruits can be harvested by shaking the plant. Plastic or cloths are placed in the surface to collect the fruits.

In some places, fruits are harvested by cutting the branches, which should be prevented. An adult person can collect 4 kg fruits per day from natural forests and 5 kg fruits per day from cultivated area.

Harvest intensity:

Harvest of fruit is regarded less destructive than other parts. Timur is a fast growing plant and propagates well by sexual and vegetative method. Therefore, 80% harvest of total yield is regarded sustainable. Nevertheless, care should be given on proper management. Only fruits need to be harvested without harming the branches or the plant.

Post harvesting:

The harvested fruits are cleaned and shade dried. All the essential oil containing plants or plant parts are shade dried to retain the volatile oil as direct expose to sunlight evaporates the oil from plant parts. The fruits are well dried in shade to prevent fungal growth. Fruits are stored when they are hard enough, indicated by the ruptured coverings. Dried fruits are stored in jute bags and kept in well-ventilated dry rooms.

Cultivation Cost

Cost per hectare for First Year

SN	Particulars	Quantity	Rate	Total
1	Nursery preparation (man-days)	10	400	4000
2	Pipe & other items purchase (set)	1	20000	20000
3	Digging pit and manuring (man-days)	40	400	16000
4	Seedlings	1000	4	4000
5	Compost fertilizer (tons)	5	700	3500
6	Plantation in the field (man-days)	10	400	4000
7	Weeding and composting (man-days)	20	400	8000
8	Regular watering (man-days)	15	400	6000
<i>Subtotal for first year</i>				65500

Cost per hectare for second year

SN	Particulars	Quantity	Rate	Total
1	Compost fertilizer	7 tons	700/ton	4900
2	Weeding and Composting (man-days)	20	400	12000
3	Regular watering (man-days)	15	400	12000
<i>Subtotal for second year</i>				28900

Cost per hectare for Third year

SN	Particulars	Quantity	Rate	Total
1	Compost fertilizer	7 tons	700/ton	4900
2	Weeding and Composting (man-days)	20	400	8000
3	Regular watering (man-days)	15	400	6000
4	Harvesting (man-days)	80	400	32000
5	Drying and storage (man-days)	10	400	4000
<i>Subtotal for third year</i>				54900

Total cost, productivity and profit

SN	Particulars	Quantity	Rate	Total
1	Cultivation cost for first three years			1,49,300
	Expert cost (borne collectively)			20,000
	Total cost			1,69,300
2	Timur production	3500 kg	100	3,50,000
3	Total profit			1,80,700
4	Profit per year per hectare			60,200

Monthly plan of budget

	Months											
Months	7	8	9	10	11	12	1	2	3	4	5	6
Activities	Seed collection				Nursery prepn	Seed sowing	Watering & weeding	Seedling plantation/manuring	Watering and weeding			
Cost for 1 st year					24000	4000	2000	29500	6000			
Cost for 2 nd year							12000	4900	12000			
Cost for 3 rd year	36000						7000	4900	7000			

Fixed Capital Requirement

Fixed capital requirement for the establishment of DU is variable because of the cost of different types of distillation unit. 1,000 liter stainless steel wet steam DU fabricated in Nepal costs about Rs 6 lakhs to 7 lakhs whereas dry steam stainless steel DU fabricated in India costs about Rs 11,00,000/-. Costs of these modern units are higher than unit with conventional direct heating system and there may be alterations in the operation cost. These facilities are difficult to put into practice in rural areas therefore the estimation of fixed capital requirement is based on the costing of 1000 liter wet steam stainless steel. It has been

estimated that about Rs 801,380/- is required for the purchase of DU and establishment of factory.

Fixed capital requirement

SN	Description	Number	Rate	Amount (Rs)
1	Land and Improvement			
	1.1 Water supply (3/4" Polythene Pipe)	1 roll	5000	5,000
	1.2 Land Development		25000	25,000
2	Building			
	2.1 Factory, store and office; A single storey, double partitioned, wood fenced, 500 sq ft base			150,000
	2.2 GT sheet roofing (10 ft X40 number) including nails	40	1500	60,000
3	Equipments			
	3.1 SS wet steam DU: 1000 liter capacity	1	500000	500000
	3.2 1000 liter water tank	1	15000	15,000
	3.3 Bucket	2	300	600
	3.4 Jug	2	40	80
	3.5 HDPE containers	4	1000	4000
	3.6 Weighing balance	1 set	4000	4,000
	3.7 Wooden mallet	2	200	400
	3.8 DU transport and installation	LS		30,000
4	Furniture			
	4.1 Chairs	5	500	2,500
	4.2 Bench	2	400	800
	4.3 Cupboard	1	4000	4,000
	Total Fixed cost			801,380

Pre operating cost

Industry registration, market linkage cost, training to the operator and other hidden costs are allocated under pre operating costs. All these cost heads are variable therefore it is difficult to estimate the actual pre operating cost. For instance Rs 50,000 is assigned as the training cost for the operator and Rs 50,000 to borne other costs, which sum to Rs 100,000 as pre operating cost.

Initial working capital

Resource inventory determines the total productivity and production quantity in turn determines the required working capital. Rural entrepreneurs do not always have enough

working capital to run unit throughout year. Furthermore extraction of Timur is expensive because of the higher price of raw material. Therefore production and sale should be planned in such a way that 10 batches extraction of Zanthoxylum oil (total yield per cycle is 120 kg) in a production cycle and sold at a time enable the entrepreneurs to prepare for next cycle of extraction. Thus by multiplying Rs 3427/- (production cost per kg) with 120 kg (production in 10 batches), Rs 411,240/- is required as initial working capital.

A comprehensive business plan has to be developed to commence any business venture as it provides guideline to the production activities. The arrangement of timeline, responsibility assignment, method of extraction, sustainable harvest quantity, amount of oil to be produced, financial assumptions, profit, etc is clearly identified and defined in the business plan. Business plan is also obligatory for industry registration.

Estimated unit production cost for Zanthoxylum oil

Description	Rate (Rs)	Quantity	Amount (Rs)
Fruit cost per batch	110	300 kg	33000
Royalty (Royalty is waived for cultivated Timur)	8	300 kg	2400
Fuel (estimated)	50	8 bhari	400
Unit Operator	450	1	450
Helper	400	1	400
Miscellaneous (water, cleaning of DU)	200		200
Sub Total			36850
Per kg production cost (@4% oil content, 12kg of oil extracted from a batch)			3070
Market and Sale			
Risk and uncertainty cost (about 10% of factory cost)			307
Transportation cost (per kg)	Lumpsum		50
Direct cost (per kg)			3427
Price (selling) at Kathmandu			5500
Profit margin per kg excluding the fixed costs (NRs)			2073

Prices given above are indicative only and might vary as per the geography local condition. It is necessary to assess all the parameters before investing on the essential oil processing enterprises

Annex 6. Allo

Assumption on productivity and costing of Allo

- One person can collect 100kg green plant per day
- About 25 kg fresh bark yield from 100kg green plant
- About 5kg of dried bark (20 per cent of 25kg fresh bark)
- 2kg Allo fibre from dried bark (40% of 5kg dried bark)
- About 1.4kg yarn (70% of 2kg Allo fibre)
- A person can weave about ½ kg yarn from fibre using the foot pedal spinning wheel (Khutte Charkha)
- About 1kg yarn can make cloth of 350cm by 63.5cm
- About 12 kg of fuel is needed to process 1 kg processed fibre.

Based on the above assumption, a cost benefit analysis of Allo is given below.

Cost benefit analysis for 250kg of stripped green bark

SN	Particulars	Quantity	Man/Days	Rate (Rs)	Amount
A	Investment				
1	Collection of Allo	1000 kg	10	400	4000
2	Stripped green bark	250 kg	5	400	2000
3	Dry bark	50kg	3	400	1200
4	i) Cooking dried Allo in Ash	50 kg	2	400	800
	ii) Cost for fuel wood	8 bhari		50	400
5	Beating, washing and drying fibre after cooking		5	400	2000
6	Soaking fibres in water and mixing white clay/rice husk or grounded maize		5	400	2000
7	Drying fibres, beating and cleaning	20 kg	2	400	800
8	Yarn and spinning time	14 kg	28	400	11200
9	Preparation loom for weaving		2	400	800
10	Weaving cloths	49m	5	500	2500
Total variable cost					27,700
B	Income				
1	Selling Cloth	49m		700/m	34,300
2	Total profit excluding the cost of fixed assets				6,600

The rate and price given above are indicative only (adopted from Pyakurel and Baniya, 2011).

Fixed Capital: Foot pedal spinning wheels, Knives, Copper vessel, wooden mallet, ropes etc are the requirement of Allo processing enterprise and a lumpsum of Rs 20,000 is kept to purchase these utensils. Processing of Allo is not carried in closed houses and therefore the cost for land improvement and factory construction is not included in the fixed capital.

Initial Working Capital: Located in the rural areas, it is difficult for entrepreneurs to visit Kathmandu regularly, therefore production of 200 m cloth in a cycle is recommended. About 1000kg stripped green bark is required to manufacture 200 m cloth. Therefore, it is estimated that Rs 110,000/- is required to operate an Allo industry.

Pre operating Cost: Industry registration, market linkage and transportation, lodging and fooding cost during industry registration at district head quarter and during market linkage in Kathmandu are kept as pre operating costs. All these cost heads are highly variable therefore it is very difficult to estimate the actual pre operating cost. Being the cottage industry, Rs 20,000 is kept as pre operating cost.

Annex 7. Chiuri

Cost of expeller and per unit cost

Particulars	Price (Nrs)
Cost of Expeller	175000
15 HP Motor	39000
Transportation (as per the area)	3000
V belt (3)	2700 (3 years durability)
Electricity connections (Three Phase)	10000
Repair and Maintenance	3000 per year
Processing Cost and Margin (unit: one kg butter)	
Cost Items	
Chiuri seed= 3.7kg @ Rs 25 per kg	92.5
Electricity	14.8
Labour	2.75
Salt	2
Total direct cost	112.05
Selling price	Rs 160
Gross Margin	47.95

Annex 8. Status of forest based industries in Rapti area

SN	District	Specialisation / Category	Numbers	Number of furniture industries
1.	Pyuthan	Furniture Handmade Paper	23 2	23
2.	Dang	Saw Mills, Furniture, Veneer Jadibuti Udyough Churi Udyough Pvt. Ltd.	136 8 1	120
3.	Salyan	Furniture, Nepali Kagaj Dhoop Masala Bee keeping Fruit Processing	6 1 3 1 2 1	6
4.	Rukum	Furniture Handmade Paper Allo Resha /Kapada	30 12 4	30
5.	Rolpa	Furniture Masala, Allo Kapada, Hand Made Paper	29 4 5 4	29
Total				208

Dalchini / Tejpat

Dalchini or Tejpat (*Cinnamomum tamala*) has been prioritized by government of Nepal for conservation and development. It is a medium sized tree that reaches up to 15m. Leaves and bark both are used commercially. It is found throughout Nepal within the altitudes of 450m to 2100 m, but the distribution is more prominent in the western Nepal. It can be propagated both by seeds and stem cuttings.

Leaves can be harvested from 10 years old tree. About 15-25 kg of leaves can be harvested in a year (leaves should be harvested in alternate years). About 12,000 kg leaf and 7,000 kg bark can be harvested from one hectare plantation. The leaves from 1 hectare yield about 50 kg of Cinnamon oil. The oil is sold at the rate of Rs 5000-Rs5500 per kg. The bark is generally sold at Rs 125 per kg.

Dalchini/Tejpat was found attractive in Ghorahi, Liwang, Sulichour, Holeri, Tharmare and Salli bazar. It will take about 10 years to harvest the leaf from cultivated tree therefore it is not attractive for promotion (especially for the short term projects). The cultivation should be initiated by farmers, private organizations on their own.

However, the short term projects can facilitate the process by quantifying the wild resource/ cultivated species (using quadrant survey method and social survey method), facilitate to establish essential oil processing unit to extract *Cinnamomum* oil in the areas of wider availability, market linkage with producers and Kathmandu level traders/ exporters and ensuring the equitable benefit sharing to all the actors involved in the value chain.

Essential oils

There are number of plant species which yields essential oils. Essential oils are chemical compounds with an odoriferous nature, volatile, insoluble in water and are obtained by steam distillation or expression methods. Nepal exports about 55 tons of essential oils, representing 2% of global trade, positioning the country 72 in the list of exporters' category. Mentha, Chamomile, Palmarosa, Citronella, Lemon grass, French basil are mostly cultivated in lowlands and are providing substantial income to the farmers.

Essential oil was found attractive in Lamahi cluster. The initiation of LFP/IFP and later other organizations has resulted the mass cultivation of Mentha and Chamomile in Lamahi area. Promotion of essential oil yielding plants is a very good initiative as most of them are annual, provides immediate income to farmers and are deterrent to wildlife and thus can be promoted in the human wildlife conflict areas. The key interventions would be:

- ♦ Optimized use of all the existing distillation units of Lamahi area
- ♦ Link the farmers with buyers at Kathmandu.
- ♦ Educate farmers to engage in long term business. Encourage them to strictly follow the signed MoU and be liable with the signed parties.

- ♦ Price of essential oil is governed by the buyers and it is ever fluctuating. The reluctance of farmers to sell in slightly low price hampers their business and may lead to heavy loss due to the prolonged storage. It is the important message to be disseminated.

Lokta

Handmade paper is made from the bark of Lokta (*Daphne papyracea* and *D. bholua*). Lokta is distributed throughout Nepal in the temperate regions. However, due to over harvesting, there is serious issue about its sustainability. Further, its cultivation is very difficult because the seeds are viability of less than seven days. Despite the sustainability issue, Handmade paper is one of the largest exporting commodity of Nepal. Handmade paper worth Rs 566.43 million was exported in FY 2011/012.

Lokta was selected in Bahane cluster. The prospect is also immense in Rolpa districts (Merul, Kureli etc) Key Interventions would be:

- ♦ Resource assessment of Lokta in the areas of wider availability. The areas can be identified from literature review and social survey.
- ♦ Skill enhancement training to community based entrepreneurs.
- ♦ Product diversification trainings to the existing entrepreneurs
- ♦ Linkage with local / regional souvenir shops
- ♦ Linkage with paper craft products, mostly stationed at Kathmandu.

Annex 10. Summary of the sharing workshop

Date	District	Location	Major Outcomes
9th March 2014	Rolpa	Liwang	Timur, Allo, Chiuri and Furniture identified as most viable forest product; prepared one year action plan; plan for visit to successful essential oil distillation site; Promote Allo as one district one product; Upgrading Kols for Chiuri ghee processing
11th March 2014	Pyuthan	Khalanga	Identified furniture, Allo, Lokta and Honey as most viable product. Prepared one year action plan; Promote large scale Bee keeping; Support existing allo and lokta enterprise;
12th March 2014	Salyan	Khalanga	Identified Timur as most promising forest based products. The focus, however, is on the raw trade (after grading) by ensuring the benefit of the collectors/ farmers. Chiuri promotion in Kalimati area;
13th March 2014	Rukum	Musikot	Identified Chiuri and Timur as most promising product. The workshop emphasize to strengthen the existing Chiuri soap enterprise and to plant the Timur grading machine.
21st April 2014	Dang	Ghorahi	Emphasize to add Honey as priority product along with essential oil, Chiuri and Timur. The workshop also identified furniture as one of the most viable forest based enterprise and recommend RN-MSFP to play a catalytic role in addressing the policy issues

Annex 11. Training Schedule

Days	Review	Session I	Session II	Session III	Session IV
Time	8:00 - 8:15	8:15 - 10:15	10:30 - 12:30	13:30 - 15:30	15:30-18:00 (Tea embedded)
Day 1	7:30-8:00 BREAKFAST	10:15-10:30 TEA BREAK	12:30-13:30 LUNCH	15:30-18:00 (Tea embedded)	
	Registration on the first day and review and reflection of previous day from second day onwards	Introduction to Training and climate setting: Basic concept of enterprises, types and legality <i>Presented by: JNP</i>	Value Chain Analysis: Definition, process, sharing result of VCA carried out at Rapti zone <i>Presented By: DP</i>	VCA- Group work: Moc identification of enterprise, prioritization and spider diagram <i>Presented and Facilitated by DP</i>	Value Chain Mapping: Concept, Steps, Functions and actors/ channels, Value chain mapping, Overlays SWOT, Economic Analysis, demand and supply <i>Presented and Group work Facilitated by DP</i>
Day 2		Value Chain Analysis: Indicators to assess the spider diagram, describing the format of the VCA report <i>Presented by DP</i>	Enterprise: Needs, importance, benefits, evaluation and selection <i>Presented by: JNP</i>	Value Chain Analysis: SWOT Analysis and Finalizing the VCA schedule <i>Presented and facilitated by: DP</i>	Business Plan: Terminologies, components of business planning <i>Presented by: JNP</i>

Days	Review	Session I	Session II	Session III	Session IV
Time	7:30-8:00 8:00-8:15	8:15 - 10:15	10:15-10:30	12:30-13:30	15:30-18:00 (Tea embedded)
Day 3		Business Plan: Preparing the business plan (market, production and management expenditure and finance <i>Presented by: JNP and DP</i>	Business Plan: Preparing the business plan (market, production and management expenditure and finance <i>Presented by: JNP and DP</i>	Business Plan: Preparing the business plan (market, production and management expenditure and finance <i>Presented by: JNP and DP</i>	Understanding the Enterprise: Game simulation (Market & Marketing Business simulation, Competition, coordination and collaboration Model presentation and case studies) <i>Presented by JNP</i>
Day 4		Business Plan: Business Plan Finalization and Presentation <i>Presented by: DP</i>	Successful Enterprise: Criteria and Character of Successful Enterprises (RN-MSFP), Annual Action Plan <i>Presented by JNP & DP</i>	Enterprise Promotion and Action Plan: Record keeping, share, dissemination, Auditing, <i>Presented by: JNP</i>	Progress review, OMS, Reporting, Employment and Income Tracking, Training Evaluation, Closing <i>Presented by: DP/JNP and all</i>

Annex 12. Photo plates



DFO Rolpa facilitating Stakeholders' Joint Workshop on Value Chain Planning at DCCI-Rolpa Hall



Value Chain Expert facilitating Stakeholders' Joint Workshop on Value Chain Planning at DDC-Pyuthan Hall



DFO Salyan facilitating Stakeholders' Joint Workshop on Value Chain Analysis at DFO-Salyan Hall



Private Sector & Enterprise Coordinator facilitating Stakeholders' Workshop on Value Chain at Rukum



Rapti Cluster Value Chain Validation Meeting at Ghorahi



Value Chain Analysis team and participants of Forest based Enterprise Promotion and Facilitation Training, Tulsipur - Dang

A detail study was conducted in Rapti area to identify the potential Timber and Non Timber Forest Products for additional employment generation and additional investment, identify issues and constraints for the promotion of the identified commodities, recommend the strategies for upgrading each steps of value chains of the identified commodities and ultimately to support the livelihoods of the rural communities. Value chain analyses were carried out for the selected five commodities (Timur, Allo, Chiuri, Wood Furniture and Saw Mills). The identified forest based commodities have potential to create employment and add more investment in the area.

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