# Socio-economic and Market study of Rattan and its Contribution in Livelihood in Nepal

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## Abbreviation

| | |
|---|---|
| ANSAB | Asia Network for Sustainable Agriculture Bio-resources' |
| CFUG | Community Forest User Group |
| CF | Community Forest |
| CFE | Community Forest Enterprises |
| DDC | District Development Committee |
| DFO` | District Forest Office |
| DCSIO | District Cottage and Small Industry Office |
| MDBRPP | Market Development of Bamboo and Rattan Products with Potential |
| DFRS | Department of Forest Research and Survey |
| DoF | Department of Forest |
| EIA | Environmental Impact Assessment |
| FOP | Forest Operational Plan |
| FNCCI | Federation of Nepalese Chamber of Commerce and Industry |
| GOs | Government Organizations |
| HNCC | Herbs and NTFP Coordination Committee |
| IEE | Initial Environmental Examination |
| INBAR | International Network for Bamboo and Rattan |
| LPG | Liquefied Petroleum Gas |
| LGSA | Local Self Governance Act |
| MAPs | Medicinal and Aromatic Plant |
| MEDEP | Micro-Enterprise Development Program |
| NGO | Non- Government Organization |
| NTFP | Non-Timber Forest Products |
| NRS | Rupees |
| RMP | Rattan Management Plan |
| SKCFUG | Sati Karnali Community Forest User Group |
| SCFUG | Sarswoti Community Forest User Group |
| TAL | Terai Arc Landscape |
| VAT | Value Added Tax |

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## Executive Summary

1.Background of the study

Among the important non-timber forest products (NTFP) in Nepal, bamboo and rattan were neglected NTFPs before three decades due to less research and development focus agendas. However it has mainstreamed into forest policy since 1993 and their amendments. Although, there are efforts made for development and policy interventions, investment of various sizes and contributed to forest and biodiversity conservation and rural livelihoods in Nepal, there is still lacking of comprehensive and systematic attempt to develop the sub-sector taking a holistic approach of linking collection, production, consumption and marketing in a systematic chain combining the essence of both supply chain and value chain. There are nine species of two genera rattan are recorded such as *Calamus tenuis*, *C.inermis*, *C.acanthospathus*, *C. latifolius*, *C.leptospadix*, *C. erectus*, *C. gracilis*, *C. khasianus* and *Plectocomia himalayana* in Nepal. Among them, *Calamus tenuis* is an endemic and widely distributed species throughout the lowland areas of the country. Rattan processing industries are major consumer of domestic and imported rattan, especially for manufacturing of handcrafts and furniture. Rattan products are getting popular enormously because they are cheap, durable, attractive and environment friendly. Rattan products are mainly consumed in domestic market and some parts are exported to foreign countries. However, status of rattan in Nepal is lesser known in the international scenario. Given these background, great potential of NTFP promotion, INBAR commissioned the study on socio-economic and marketing with potential to livelihood in Nepal with the objective of assessing the potentiality of rattan in socio-economic and marketing. The

study is based on consultation with community people, rattan entrepreneurs and forest technicians those who were directly involved in rattan conservation.

## 2. Methodology

The study was conducted in community forest user groups (CFUG) of Kailali and Bardiya districts which are located in the far and mid west Terai of Nepal, and survey of rattan enterprises in Kathmandu valley, Narayangadh, Bharatpur, Pokhara, Butwal, Bhairahawa, Dhangadhi, Kanchanpur, Kakarvita, Dharan, Biratnagar including other major cities. Information was collected from entrepreneurs, CFUG members of various parts of Nepal, traders, technicians' service providers. The sampling frame was also developed based on the random sampling of CFUG and enterprises of rattan pockets for this study. The questionnaire survey was conducted to 561 respondents. Out of them 35 were rattan processors and 526 were community people. Secondary information was collected from published and unpublished literatures. Audit reports of Sati Karnali CFUG, Kailali were taken into account for financial and social development activities. Primary data was collected interviewing with 10 CFUG members and 35 entrepreneurs and bamboo and rattan traders. Direct observation and interaction with CFUG and entrepreneurs are another major source of information. Analysis was focused on three aspects- the socio-economic study through management of resources and enterprises, marketing of rattan, and policy of forest and NTFP resources including NTFP based enterprises.

## 3. Result and discussion

### 3.1.Regulatory provisions and constraints

The report attempts to answer the key questions concerned by INBAR. For example, what is status and trends in rattan community forestry production and coverage area?; What are national drivers causing changes to community rattan forestry production and coverage area? How can we secure the ongoing sustainable use of rattan in community forestry? And what is market and marketing scenario of rattan in Nepal? Problems and status of rattan is described highlighting challenges, policies and regulations, contribution of rattan in socio-economic development.

The NTFP trade is largely informal and interventions that encourage NTFP trade and enterprise development are limited. Majority of the NTFPs goes to Indian market which is creating dependency on Indian traders. From the policy perspective, Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) is mandatory for managing and handing over community forest larger than 500ha and 750ha, respectively. Due to this mandatory rule, it is more challenging to handover the forest to the community to include all the potential NTFPs in their operational plan and get it approved by DFO. Despite, Herb and NTFP Policy 2004 is in place to improve management of NTFPs by promoting good harvesting practices, in-situ and *ex-situ* conservation of endangered NTFPs, designation of specific

potential areas as "NTFP areas," and creation of favourable environments for maximally benefiting local people. The new policy promises to prepare and implement separate short-term and long-term master plans for the overall development of NTFPs. However, there are some policies are experienced as regulating the promotion of NTFP-based enterprises such as lengthy and costly export formalities has discouraged export, ban on collection and trade of commercially valuable NTFPs that can be harvested on a non-destructive basis has triggered illegal trade thereby creating elites to capture the business, contradictions between forest acts and local governance acts regarding control over NTFP use and management have caused NTFP collectors and traders pay excessive taxes, absence of NTFP management directives and guidelines for community forests, NTFPs are controlled centrally and permits given to big contractors, reducing local access and incomes; impractical enterprise registration and establishment formalities for small and micro-enterprises, business opportunity goes untapped at local level; NTFPs from private land require approval from the DFO. The approval process is lengthy and cumbersome due to which private sector is not very encouraged for domestication of NTFPs and growing trees in private forests.

3.2. Socio-economic:

Rattan contributes household and enterprise such as furniture and handicraft, decorative material, medicinal, environmental conservation, source of income, cultural and religious and biodiversity conservation, and employment generation. Rattan is major source of income to the community forest user groups of Kailali and Bardiya districts. During the last 12 years (2005 to 2016) rattan was sold equivalent to NRs 12.83 million (US $ 126964. 36). Out of that NRs 3.27 (US$ 32964) (2.68 percentages) was invested for community development. Besides, CFUGs also earns from selling of rattan derivatives such as fruits, leaf sheaths and leaves sold to community people for household purposes and other NTFPs such as Pipla (*Piper longum*), Sikakai (*Acacia concinna*), Bojho (*Acorus calamus*), Satavari (*Asparagus racemosus*) honey and fruits are abundantly coming up in the forest. Sati Karnali Community Forest User Group (SKCFUG) alone sold such rattan derivatives and NTFPs and earned NRs 534,574 (US $ 5293) during the period of 2005 to 2015. Contribution of rattan in the local economy of Kailali and Bardiya districts are Social and institutional development, Education and Scholarship, adaptation, pro-poor support, enterprise development support, forest development and Ecological and environmental development.

In the enterprise development, there are about 55 rattan processing industries in 17 cities of 13 districts. Average earning by large size enterprises is NRs 0.54 million per annum where as NRs 0.42 million by small and medium size of enterprises. Rattan handicrafts such as rack, hanger, basket and tools are also sold by the fancy shops in the urban area that also creates employment. There are 12 CFUGs employed 2-5 forest watchmen and 2-3 staffs. More than 70 persons are involved in rattan selling in fancy shop, transportation, harvesting and trading. With this figure, NRs 52.27 million (US $ 517545) is earning by workers, where as NRs 2.88 million by CFUG and NRs 4.2 million by service providers. Total earning by entrepreneurs, CFUGs and service providers are NRs 59.35 million (US $ 587644) per year.

More than 479 people (409 persons directly and 70 persons are indirectly) employed in rattan business. Rattan processing industries are increasing in the major cities gradually, where as decreasing in rural areas those depending on Nepalese raw cane is facing severe scarcity of cane. Growth trend concluded with reference to 35 rattan processing industries which were surveyed during the study period, shows that 55 to 66 percent rattan industries were increased in the each decade before 2015. More than 15 rattan processing centers were closed located in Birganj, Hetauda, Rajbiraj, Itahari, Janakpur, Banke, Bardiya and Kailali in the past. It is estimated that 30-40 percentage enterprises are opening and closing frequently due to scarcity of raw material and labor shortage.

### 3.3. Processing industries

In the past, processing industries were confined to major cities. However, number of processing industries have reached 66 in 2005 from 42 in 1996. In 2016, number of processing industries running are 55, decreased by 17 percentage. Annual consumption of imported rattan from India and other countries ranges 105 to 135 truck, out of them large diameter of rattan ranges 95 to 105 full truck load and small size diameter rattan 30- 40 full truck load, with the value NRs 60 to 98 million (US$ 6 to 9.8 million). Total import of rattan from India is about 95 percentages. Nepali bet was used extensively in the past in Nepal. However, due to administrative cumbersome of Nepali bet by District Forest Office and District Development Committee and National park, Nepali bet is not purchased now. Mainly Indian contractors purchase Nepali cane from the community forests. Nepali canr is long and considered good quality. Nepali cane- roughly 160 to 200 trucks is produced per year in community forests. Hardly, 50-60 trucks is consumed in Nepal. Hence total cost of Nepalese rattan is NRs 1,400,000 to 1,700,000. Out of them, value of Nepali rattan consumed in domestic market is about NRs 437,500 to NRs. 525,000. Value of Nepali rattan exported to India ranges NRs 962,000 to NRs. 1,225,000.

### 3.5.Market and marketing

Nepal has good opportunity to expand the rattan products in neighboring countries and international market. Nepal can export rattan products in china and India due to population high there. Rattan business needs to be established value chain. More actors are required to be involved in production, processing and trading. India has good market because rattan furniture is also used in offices. High quality rattan products have good opportunity in the international market.

Price of cane has been increased continuously by 10-15 percent each year. Importing cane from India is risky job since export was banned by the Government of India. There are many formalities to address in the route such as check post, taxes etc during the transportation. As a result prices of raw cane increased sometimes 4-5 times of the farm gate price. On the other hand, there are no securities and incentives to cane industries from government of Nepal. Increase in price of petroleum products; ultimately increase the price of transportation. According to traders, rattan resources in major production area of India- Assam and Arunachal

Pradesh has also been decreased. Rattan traders say that price of raw material was increased NRs 15 in 2015 and NRs 17 in 2016 per kg. In the past few years, political instability in Nepal caused frequent road blockade by various political parties which lead to risk to transports and increased heavily price in transportation.

3.6. Demand and supply of rattan

Annual consumption of imported rattan from India and other countries ranges 105 to 135 truck, out of them large diameter of rattan ranges 95 to 105 full truck load and small size diameter rattan 30- 40 full truck load, with the value NRs 60 to 98 million (US$ 6 to 9.8 million). Total import of rattan from India is about 95 percentages. Total demand of cane in Nepal is around 300 to 400 truck. It means deficit of cane supply is approximately 150 to 200 trucks per annum.

3.6. Management initiatives

Scientific management practice of rattan is limited to very few community forest of Nepal. Only few CFUGs have commercialized rattan as its management is the pure technical and local communities may not have adequate knowledge about this. However, management of rattan in Nepal is one of the models in the world due to participatory and distribution of benefits to their users. Rattan is managed through adaptive knowledge management practice which combines indigenous knowledge and scientific management. Protection of forest is governed by indigenous management where as rattan is managed by scientific management practice. However, due to availability of rattan in limited community forests, scientific management practice has not been generalized. The indigenous management system has improvised by technology which is called improved management system. Improved management is the product of successful result of value added technology, thoughts and training in indigenous knowledge.

3.7. Incentives and disincentives

Rattan is renewable natural resources. Therefore, it can be used abundantly as raw material to manufacture products. They have many possible application on and uses. Due to rich labor force available in the country and abundant craftsmanship, Nepal could gain comparative advantage, provided that workforce could be trained in improving their skill and if enterprises could be developed for processing and marketing. Rattan processing industry needs small size of investment to start the business, possibly NRs 50,000 to NRs 100,000 and family members could be involved in the processing work. The products manufactured by these enterprises are traditional and easily marketable in the local and national market. There are government affiliated skill development training centers providing training to some extent.

At the national level, interest of researchers, NGOs and community people for the conservation of rattan has been increased. As a result, series of research works have been

undertaken in the sub-sector of rattan. Rattan has drawn attention of some forestry projects, forestry staffs and civil societies for its development and replication in other areas. Rattan was listed in the category of NTFPs and policy in favor of NTFP development, income generation, and handover of ownership in local people developed.

At the community level ownership of local people has been increased in conservation, management and utilization of rattan for biodiversity and livelihood purpose. Disadvantage people and women's participation has been increased in meeting, general assembly and development works. Conservation education programs was run in the secondary schools, village level meeting and social gatherings in coordination with local schools, development agencies (NGO, INGO, GOs). Democratic exercise was increased within the community people and under the main committee various sub-committees were formed to monitor, control and enhance the efficiency of community investments and progress

Numbers of households in the CFUGs are large size in most of the cases where size of community forests are very small. There are more than 50 percent of the households are ultra-poor who needs immediate financial incentives which community forest cannot fulfill. As a result, they become frustrated and willingness of participation becomes low in the forest conservation. Government policies such as IEE and EIA are hindering to utilize the forest products such as rattan in the forest and thus cause de-motivates to forest users. Rattan processing industries are facing shortage of raw material and skill labor to sustain their enterprises. As a result they are less encouraged to run their business. Lack of government commitment to strengthen the sub-sector of bamboo and rattan, and processing centers

# 1. INTRODUCTION

## 1.1. Background of the study

Rattan is considered to be an important non-timber forest product (NTFP) in Nepal. Among the various categories such as medicinal and aromatic plants (MAP), pharmaceuticals, nutraceuticals, bamboo and rattan and medicinal food sub-sector which is a multi-million dollar sector in Nepal (NPC, 2015). Despite bamboo and rattan were neglected NTFPs before three decades due to less research and development focus agendas (Chowdhary and Paudel 2008), however it has mainstreamed into forest policy since 1993 and their amendments. To understand and develop a growth and development strategy for such a complex sub-sector is a challenging task. In fact during the last twenty five years the NTFP sub-sectors has witnessed a number of development and policy interventions, investment of various sizes and contributed to forest and biodiversity conservation and rural livelihoods (Karki et al, 2004). However, there has been scarcely any comprehensive and systematic attempt to develop the sub-sector taking a holistic approach of linking collection, production, consumption and marketing in a systematic chain combining the essence of both supply chain and value chain.

In Nepal, there are more than 700 plant species that have medicinal value, of which 238 are in active use and 100 are traded. The Government of Nepal has kept 30 species in priority, of which 12 are for commercial cultivation and market promotion (AEC/FNCCI 2004, 2004, Subedi 2006, Shrestha and Das 2008). Rattan is excluded in the government priorities of them, even though it has contributed to local economy of community forest users and biodiversity conservation. Nine species of two genera rattan are recorded in Nepal. They are *Calamus tenuis*, *C.inermis*, *C.acanthospathus*, *C. latifolius*, *C.leptospadix*, *C. erectus*, *C. gracilis*, *C. khasianus* and *Plectocomia himalayana*. Among them, *Calamus tenuis*, *Calamus acanthospathus* and *Calamus inermis* are protected mostly in community forests (Chowdhary and Paudel 2008); *Calamus tenuis* is an endemic and widely distributed species throughout the lowland areas of the country. Rattan has been locally used for various domestic purposes but largely as basketry and furniture. The resource base has been depleted significantly over the last few decades (Chowdhary 1995; Chowdhary and Paudel 1996a, 1996b; Chowdhary and Paudel 2008). More than 60 percentage of the natural rattan forests have already vanished in different parts of the country. Despite these negative figures, the recent community forestry programme has brought a positive change in the conservation and management of forest resources, including the management of non-timber forest products such as rattan. A few community forest user groups (CFUG) have emphasized rattan as a priority resource to conserve and manage in the community forests.

Rattan processing industries are major consumer of domestic and imported rattan, especially for manufacturing of handcrafts and furniture. Rattan products are getting popular enrmously

because they are cheap, durable, and attractive and environment friendly. Rattan products are mainly consumed in domestic market and some parts are exported to foreign countries.

The socio-economic and trade aspects need to be explored to their full potential. Further, market potentialities, policy to promote it, and opportunities are need to be explored.

Given these background, great potential of NTFP promotion, INBAR commissioned the study on socio-economic and marketing with potential to livelihood in Nepal. The study is based on consultation with community people, rattan entrepreneurs and forest technicians those who were directly involved in rattan conservation.

### 1.2. Objective of the Study

The general objective of this study is to assess the potentiality of rattan in socio-economic and marketing with potential to livelihoods in Nepal. The specific objectives are to:

- To assess the contribution of rattan to local livelihoods and cottage industry;
- To analyze the main rattan markets (domestic and export) and their values;
- To evaluate the contribution of rattan on green economic development in Nepal;
- To identify the barriers to greater uptake and use of rattan;
- To assess the current incentives or disincentives for rattan use;

### 1.3. Limitation of the study

This study was conducted with diverse respondents of rattan concerned people of Nepal by a team of two members supported. Field data was collected from 15 December 2016 to 30 April 2017, soon after the fuel crisis ended and rehabilitation of earthquake was intensively taking place. Therefore, it was difficult to concentrate respondents on information collection. Large geographical area covered for marketing survey, from east to west of Nepal, enterprises scattered in limited town areas were cumbersome to reach to them. Entrepreneurs were not open to share their information fearing of business secrecy.

## 2. METHODOLOGY

### 2.1. Selection of study area

**Study area:** The study was based on the study conducted in community forest user groups (CFUG) of Kailali and Bardiya districts which are located in the far and mid west Terai of Nepal, and survey of rattan enterprises in Kathmandu valley, Narayangadh, Bharatpur, Pokhara, Butwal, Bhairahawa, Dhangadhi, Kanchanpur, Kakarvita, Dharan, Biratnagar including other major cities. Information was collected from entrepreneurs, CFUG members of various parts of Nepal, traders, technicians' service providers.

Selection of areas for the study was also based on the availability of natural rattan managed by Community Forest User Groups, and major cities rattan processing industries located. The following factors were duly considered.

- Scope of sustainable management of rattan in the community forests (CF) for scale up of production.
- Community forests managing natural rattan from last several years and scope of rattan enterprises development.
- District Forest Office (DFOs) intervene for rattan management to community forest.
- Cities where rattan processing centres are located with major trading corridor.

The study considered corridor approach rather than the number of CFUGs and enterprises. The corridor was again selected on the basis of the potentiality of socio-economic and marketing scope of rattan. The focus of the study was to assess rattan managed by CFUGs and marketing activities undertaken.

### 2.2. Sampling frame

The sampling frame was also developed based on the random sampling of CFUG and enterprises of rattan pockets for this study. As prioritized in the scope of study of International Network for Bamboo and Rattan (INBAR), the research team were selected following areas purposively for this study.

Table 1: Sampling Frame

| Region | District | CFUGs | Enterprises | Government organizations. |
|---|---|---|---|---|
| Central | Kathmandu, Lalitpur and Bhaktapur | 0 | 16 | |
| Far western | Kailali | 131 | 4 | 1 |
| Central | Chitwan | 0 | 3 | |
| Western | Dang | 0 | 1 | |
| Western | Banke | 0 | 2 | 1 |
| Western | Bardiya | 395 | 3 | 1 |
| Western | Kaski | 0 | 2 | |
| Eastern | Jhapa | 0 | 3 | |
| Eastern | Sunsari | 0 | 1 | |
| Total | | 526 | 35 | 3 |

The questionnaire survey was conducted to 561 respondents. Out of them 35 were rattan processors and 526 were community people. Among the 35 rattan processors, 7 (20 percentage) were women and 28 (80 percentage) were men. Likewise, out of the 526 community people, 146(27.6 percentage) were women and 381 (72.4 percentage) were men.

Secondary information was collected from published and unpublished literatures. Audit reports of Sati Karnali CFUG, Kailali were taken into account for financial and social development activities. Primary data was collected interviewing with 10 CFUG members and 35 entrepreneurs and bamboo and rattan traders. Notebook was maintained to update data of plantation, marketing and development information. Direct observation and interaction with CFUG and entrepreneurs are another major source of information

### 2.3. Sample size

Household survey was conducted to collect primary information from the households about their perception on the scope of promoting rattan in the community. The sample for this purpose was taken purposively from the purposively selected CFUGs. Since the population was homogenous in terms of livelihoods and rattan uses, a sample of 526 households would have been enough for this study (Paret and Martz, 2009). On the other hand, from the past experiences, numbers of rattan processing centers are about 55 in Nepal. For maximum accuracy, 35 entrepreneurs were interviewed representing all the geographical locations and marketing corridors.

### 2.4. Research tools

Basically, four types of tools were used to gather required information in this study.

Household survey to gather information on individual perception about the income, uses, status of rattan production, processing and marketing in Nepal.

Focus group discussion to gather information on the trends, problems and constraints and opportunities for the promotion of rattan management and marketing in Nepal.

Key informant survey for the collection of information on individual experiences in various aspects of rattan and preparation of case studies:

Institutional survey to collect information on local policies and strategies of the institutions involved in rattan promotion in Nepal.

### 2.5. Analysis framework

The analysis was carried out in three aspects as follows.

- One aspect of the analysis has been focused on the socio-economic study though management of resources and enterprises, be it a collection from community forests, production in private lands, processing in any form to add value to the primary produce.

- Second aspect has been focused on marketing of rattan, locally produced rattan and imported for the purpose of furniture processing. It was done with an aim to survey the marketing chain of rattan in totality.

- Last aspect has been focused on policy analysis of forest and NTFP resources including NTFP based enterprises. It aims to analyse the strength and weakness of policy promoting including rattan.

The analysis was also carried out to examine the comparative advantage of NTFPs, in particular to rattan. Its results have been compared with the general findings of various studies that rattan enterprises give lower employment.

## 3. REVIEW OF PROBLEMS

### 3.1. Question to be addressed

(a) A report on rattan production from community forests that helps answer the following questions:

I. Status and trends in rattan community forestry production and coverage area.
II. National drivers causing changes to community rattan forestry production and coverage area (this should involve providing data and information on wild rattan collection plus rattan trading at the very least - there should also be other broader policy considerations etc. that are playing a role as well)
III. How can we secure the ongoing sustainable use of rattan in community forestry?
IV. For the trade data, more detailed data for the national internal market, as well as informal/unrecorded export trade (that may very well be illegal in nature and isn't captured in official statistics) but this would be very helpful.

### 3.2. Development challenges of Rattan sub-sector

Rattan as a category of NTFPs, the challenges explained in the following paragraph are of NTFPs.

- Majority of the NTFPs goes to Indian market which is creating dependency on Indian traders. Indian buyers, therefore, have monopoly and many times do not provide the real price of the product (Pokharel et al, 2009)

- The NTFP trade is largely informal and interventions that encourage NTFP trade and enterprise development are limited. In addition, corruption and bribery is rampant in the national market while international market is non-transparent, keeping the traders and entrepreneurs always at risk (Banjade and Poudel, 2008)
- NTFP entrepreneurship is weak. Hence, community should be supported externally for the promotion of community forest enterprise (CFE). There are seven most critical services namely - a) input supply/raw material sourcing, b) enterprise development planning, c) enterprise operation and management, d) technology and product development, e) legal and policy reformulation, f) marketing, and g) finance, required to promote CFEs (ANSAB, 2010).
- NTFP collection method and processing is still traditional and primitive. Hence, modernisation of NTFP collection and processing method based on scientific knowledge is a challenge to achieve efficiency in production and processing (Acharya et al, 2009).
- Government of Nepal in April 2007 has made Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) mandatory for managing and handing over community forest larger than 500ha and 750ha, respectively. CFUGs are not allowed to harvest any products if sustainable use plans are not incorporated in their Operational Plan of their forest management as per Forest Act 1993 and Forest Regulation 1995. Due to this mandatory rule, it is more challenging to handover the forest to the community and the community to include all the potential NTFPs in their operational plan and get it approved by DFO.
- Assuring product quality, market information, brand recognition, government policy and legislation and inadequate national priority are challenges in value addition (FAO, 2009).
- There is low level of private investment as the privates are not encouraged to invest due to levy on NTFPs grown in the private land as well
- Advertising needs to be targeted with consistent themes from the Nepali suppliers to build a positive Nepali image in overseas markets.

### 3.3 Review of NTFP Policies and Regulations

#### 3.3.1 NTFP Promotion Policy

There are several policies that support the promotion of NTFPs. The latest is the Herb and NTFP Policy 2004. IRG (2006) has summarized the objectives of this policy as follows in its case study report.

- Encourage sustainable production, collection, processing and management of NTFPs for maximum economic and environmental benefits;
- Promote commercial production of NTFP species through ex-situ conservation;

- Enhance participation of the private sector, local bodies and others in primary level processing of NTFPs at the local level with a view to raising income and employment in remote and inaccessible rural areas;
- Promote commercial competitiveness of NTFPs by providing and developing capital, infrastructure, technical know-how, skills and marketing in order to reduce poverty of local people;
- Ensure participation of socially deprived people and women in the collection, processing, production and marketing of NTFPs; and
- Promote competitiveness and marketing of NTFPs in international markets.
- The policy seeks to improve management of NTFPs by promoting good harvesting practices, in-situ and *ex-situ* conservation of endangered NTFPs, designation of specific potential areas as "NTFP areas," and creation of favourable environments for maximally benefiting local people. The new policy promises to prepare and implement separate short-term and long-term master plans for the overall development of NTFPs. The key features of the policy include: (i) conservation and proper utilization based on sustainable development, (ii) people's participation, certification, simplification of the tax system, ensuring due benefits of appropriate technologies to the people, and awareness raising and provision of support for skill enhancement and commercialization.
- Promote NTFP and its enterprises in community forest user groups mainstreaming into forest operational plan, business plan of enterprise for sustainable business of forest resources and NTFPs / rattan (GON 2007).

In addition, NTFP (MAPs and essential oils) was chosen by Nepal Trade Integration Strategy (NTIS 2010) as one of 19 goods and services having export potential (Sharma and Shrestha, 2011).

### 3.3.2 Regulatory Policies

Among several policies, some policies are experienced as regulating the promotion of NTFP-based enterprises. Asia Network for Sustainable Agriculture Bio-resources (ANSAB) has summarized the regulatory policies in its Report on "Challenges and Opportunities for Nepal's Small and Medium Forest Enterprises (FAO, 2009) as follows.

- Lengthy and costly export formalities has discouraged export
- Ban on collection and trade of commercially valuable NTFPs that can be harvested on a non-destructive basis has triggered illegal trade thereby creating elites to capture the business
- Contradictions between forest acts and local governance acts regarding control over NTFP use and management have caused NTFP collectors and traders pay excessive taxes

- Forest User Group (FUG) rights for NTFPs withheld in forests where Department of Forest (DoF) has separate agreements with other companies
- Due to the absence of NTFP management directives and guidelines for community forests, NTFPs are controlled centrally and permits given to big contractors, reducing local access and incomes
- Because of inadequate financial incentives to community based NTFP enterprises, business opportunity goes untapped at local level
- Due to impractical enterprise registration and establishment formalities for small and micro-enterprises, business opportunity goes untapped at local level
- Distorted implementation of regulatory provisions – e.g. royalty for NTFPs from private forests and cultivation, wrong identification of species, etc. have discouraged individual cultivators from growing NTFPs

In addition to these policies, the following policies were also found documented as policies that need to be clarified.

- Contradictory Taxation - Forest Act 1993 and Local Self Governance Act (LSGA) 1999. As per the Forest Act, forest resources are national resources and thus the revenue from the forest resources should go to national treasury. On the other hand, LSGA 1999 says that revenues from the community forests are local revenues and thus should go to local government treasury.
- There are many other unseen costs paid to the forestry officials, security persons and customs officials.
- The custom office levies 5 percent duty on the market price of the NTFPs at the export point but there is no clarity about which market price it takes as base (Kunwar, 2009).
- IEE and EIA required for handing over of community forest of 500 ha and 750 ha, respectively, to users' groups. It has delayed the process of handing over forest to communities. NTFP industries using raw materials more than 5 and 50 tons require IEE and EIA certificates making it not only cumbersome but also adding to cost of processing.

  Despite the noble aim of conserving NTFPs, the banning policy has not been able to enhance conservation. It has rather triggered illegal trade and smuggling. The implication of illegal trading is increased cost of handling to traders due to which the collectors' price has been reduced. In addition, ban for export in crude form has reduced the international market as the buyers prefer crude form to avoid the possibility of adulteration.
- NTFPs from private land require approval from the DFO. The approval process is lengthy and cumbersome due to which private sector is not very encouraged for domestication of NTFPs and growing trees in private forests. Private sector feels that they should be allowed to trade products from their private forests as they freely trade their agricultural produce from their private land.

- Trade on timber or NTFPs is often opaque involving several instances, rent-seeking and under-the-table arrangements.
- Rattan is commercially collected in the far west Terai of Nepal and have to be transported a long way to Kathmandu or other trading centres. On the way traders have to pass through several checkpoints set up by the police, the Department of Forest, and local governments. At each point, the products or documents have to be submitted for inspection. This increases transportation time, creates unnecessary hassle to entrepreneurs, and at times involves corruption. In many instances, the quality of forest products degrades due to the long transit time.
- Efficiency of export is reduced as exporters need to obtain a collection permit, transport permit, certificate of origin and certificate of identification (involving CITES clearance) from various organisations as follows.
    - Collection Permit given by DFO/CFUG
    - Royalty Payment collected by DFO/CFUG
    - Issue (transit) Permit given by DFO
    - Local Taxes collected by District Development Committee (DDC)
    - Certificate of origin Federation of Nepalese Chamber of Commerce and Industry (FNCCI)/Nepal Chamber of Commerce (NCC)

IRG (2006) has reported that the government imposed regulations have resulted in a distorted environment detrimental to the overall development of the NTFPs from the collector's perspective. It has further reported that corruption in the Government agencies is a difficult reality for collectors, traders, and processors to overcome. Those with the financial means to address the needs of government officials, police officials, and forestry and customs agencies can profit within the current environment. However, those without the financial means or political/social clout suffer by not being able to collect or trade their products in a legal manner.

## 4. SOCIO-ECONOMIC AND MARKET STUDY ON RATTAN AND ITS CONTRIBUTION TO LIVELIHOODS

Rattan is very important source of livelihood for the economically and socially weaker section of the Nepalese community. These are used as raw materials for a variety of products, the demand for which is increasing both in national and international market (MDBRPP/DFRS 2010). Rattan, although, used for various small construction and basketry, Nepalese rattan are mainly used for seven major purposes such as **furniture and handicraft** (basketry, furniture, decorative, household items and handicraft), **decorative material** (lamp cover, bangles stand, dolls, curtain rings), **medicinal** (Ayurvedic pharmacology- dysentery, ulcer, anti-snake and insect bite, tonic, food material of fruits and shoots), **environmental conservation** (controlling of soil erosion, recharging of water sources, greenery and improvement of edaphic quality), **source of income** (income source of community forest user groups), **cultural and religious** (worshiping as a holy plants, stick kept in the goddess home and Guruba keep stick with him

to chase away evil spirit, making Machhindranath Rath), and **biodiversity conservation** (suitable habitat for Pythons, leopard, sloth bear, wild boar, snakes including birds and medicinal plants) (Chowdhary and Paudel 2008).

Bamboo and rattan industries play significant role in generating additional employment in the country. A study conducted by German Technical Cooperation/ Private Sector Promotion (2006), bamboo and rattan growers, traders, manufacturers and sellers, the monthly turnover of the bamboo and rattan enterprises ranges from NRs 5000 to NRs 10,000 in general and NRs 300,000 to NRs 500,000 in special cases (INCON 2006). In recent days, rattan is popular in much rural area for varieties of indoor construction. Community Forest User Groups (CFUGs) are planting rattan in their forest area for the sake of quick income generation and environmental purpose.

### 4.1. Collection of rattan from community Forests

Rattan is major source of income to the community forest user groups of Kailali and Bardiya districts. Table 2 shows that during the last 12 years (2005 to 2016) rattan was sold equivalent to NRs 12.83 million (US $ 126964. 36). Out of that NRs 3.27 (US$ 32964) (2.68 percentages) was invested for community development. Although rattan is great potential for income generation of CFUGs, harvesting of rattan from community forests is not regular in the recent years. Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) process imposed by the Government of Nepal is major bottleneck. According to Environmental Protection Act 2007, CFUGs require to conduct IEE and get approval from Department of Forest (DoF) to harvest more than 5000 kg of rattan or forest products at a time. There are more than 15 CFUGs of Kailali and Bardiya district waiting for IEE preparation and approval.

Table 2: Harvesting Of Rattan In Kailali And Bardiya District

| Kailali district | | | | Bardiya district | | |
|---|---|---|---|---|---|---|
| Year | No. of CFUG | Quintal | Amount (NRs) | No. of CFUG | Quintal | Amount (NRs aprox) |
| 2005 | 1 | 46 | 67,896.00 | 2 | 100 | 580,000.00 |
| 2006 | 1 | 420 | 1,974,251.00 | 2 | 70 | 406,000.00 |
| 2007 | 1 | 613 | 1,104,319.00 | 2 | 70 | 420,000.00 |
| 2008 | 1 | 3 | 6,251.00 | 1 | 31 | 186,000.00 |
| 2009 | 1 | 533 | 2,667,780.00 | | 0 | - |
| 2010 | 1 | 58 | 315,510.00 | | 0 | - |
| 2011 | 1 | 208 | 1,146,558.00 | | 0 | - |
| 2012 | 1 | 131 | 328,028.00 | | 0 | - |
| 2013 | 1 | 157 | 847,800.00 | | 0 | - |
| 2014 | 1 | 150 | 1,815,670.00 | | 0 | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2015 | 1 | 15 | 97,500.00 | | 0 | - |
| 2016 | 1 | 0 | 0 | 1 | 50 | 325,000.00 |
| Total | | 2334 | 10,371,563.00 | | 321 | 1,917,000.00 |
| Grand total | 5 | 2655 | 12288563.00 | | | |

Note: 1 quintal= 100 Kg

Except rattan stems, rattan derivatives such as fruits, leaf sheaths and leaves sold to community people for household purposes. Fruits are sold for decorative and nursery purposes where as leaf sheath is preferred by local people for broom making. In the rattan forest, other NTFPs such as Pipla (*Piper longum*), Sikakai (*Acacia concinna*), Bojho (*Acorus calamus*), Satavari (*Asparagus racemosus*) honey and fruits are abundantly coming up in the forest. Sati Karnali Community Forest User Group (SKCFUG) alone sold such rattan derivatives and NTFPs and earned NRs 534,574 (US $ 5293) during the period of 2005 to 2015.

Table 3: Income From Selling Of Rattan Derivatives And NTFPs

| Year | Cane (Derivatives- fruit, sheath, leaves) (NRs) | NTFPs other than cane (NRs) |
|---|---|---|
| 2005 | 67,679.00 | 14,144.00 |
| 2006 | 23,375.00 | 403.00 |
| 2007 | 750.00 | 60,394.00 |
| 2008 | 64,480.00 | 0.00 |
| 2009 | 46,162.00 | 20,495.00 |
| 2010 | 17,733.00 | 7,680.00 |
| 2011 | 9,994.00 | 5,996.00 |
| 2012 | 0.00 | 0.00 |
| 2013 | 77,124.00 | 0.00 |
| 2014 | 118,165.00 | 0.00 |
| Total | 425,462.00 | 109,112.00 |
| | Grand total | 534,574.00 |

### 4.2. Contribution of rattan in local economy

The Forest Act 1993 has made provision to utilize the community forestry fund for community forest development as well as social development. According to it, at least 25 percentage of the total community fund must be used in forest development, and remaining could be used for institution and social development. The case study of Sati Karnali Community Forest User Group (SKCFUG) of Kailali and Sarswoti Community Forest User Group (SCFUG) of Bardiya shows that both SKCFUG and SCFUG prioritized the primary and secondary tasks to be accomplished in the CFUG. Primary and secondary tasks were development works for community forest and social development works, respectively. The forest development works includes all the works related to conservation, management and utilization of forest development. Social development work refers infrastructure development, socio-economic, health and educational activities (Paudel and Chowdhary 1995).

Although there is various contribution of rattan in the local economy of Kailali and Bardiya districts, only seven of the direct contributions are mentioned here. For this livelihood support and social development by SKCFUG and Sarswoti CFUG (SCFUG) of Bardiya district from 2005 to 2016 is motioned below. The SKCFUG has utilized NRs 2.9 million rupees (US 29,300) and Sarswoti CFUG NRs 0.37 million (US$ 3664) for community development.

1. **Social and institutional development**: SKCFUG contributed NRs 0.726 million (US $ 7196) for construction of watch tower for forest conservation, waiting place, school construction, salary paid to school teachers, sports support to youth clubs, prize and honor support to senior citizens.

   Sarswoti CFUG of Bardiya district constructed a community building investing NRs 0.5 million (US $ 4951), out of that 50 percentage was contributed from selling of rattan.

2. **Education and Scholarship**: NRs 0.0245 (US $ 243) for education support to 30 students from poor and Dalit households belonging to grade 5 to 10 were provided financial scholarship to encourage them for their study.

3. **Adaptation**: SKCFUG invested NRs 1.3 million ( US$ 13006) to construct dam in Karnali river which damaged more than 300 households, inundated agriculture lands and damaged the forest area by flood. The SKCFUG also supported to community households to install improved cook stoves as per Disaster Risk Reduction Plan (DRRP).

4. **Pro-poor support**: SKCFUG invested NRs 0.885 million (US $ 8765) to purchase bank share for users, financial support to disabled persons, seed money support to 100 households to start the small business. The SKCFUG supported NRs 10,000 to each household of selected 30 households for enterprise development support without interest. Sarswoti CFUG of Bardiya district NRs 120,000 (US$ 1188) was supported to 12 households for vegetable farming.

5. **Enterprise development support**: SKCFUG organized three events of three-month cane furniture making training to develop entrepreneurship skill to 15 youths. The SKCFUG provides raw cane to users in subsidized rate to start enterprises and household uses. Interested users get 10 Kg rattan stems at the rate of NRs 30 per kg. Likewise, SCFUG provided cane furniture making training to 17 youths to start cane furniture enterprises in the communities. As a result, four cane furniture industries are running by them.

6. **Forest development**: SKCFUG has hired five forest watchmen to protect forest against illegal cutting of forest products and protect from fire, managed forest blocks for rotational harvesting of rattan in the forest, conservation of biodiversity in the forest, regulated block management and plantation of trees and conservation of biodiversity.

7. **Ecological and environmental aspects of rattan:** Rattan forest are considered biodiversity rich habitat. There are varieties of flora and fauna coming up in the rattan forests. In case of SKCFUG and CFs of Bardiya district revealed that some commercial NTFPs such as Pipla (*Piper longum*) has abundantly occurred in the rattan forest. There are various other NTFPs such as Gurjo (*Tinospora cordifolia*), Khayer (*Acacia catechu*), Bel (*Aegel marmelos*), Amla (*Phylanthus emblica*), Chutro (*Berberis aristata*), Bojho (*Acorus calamus*), Kurilo (*Asparagus racemosus*) and other tree species such as Sisoo (*Dalbergia sissoo*); Siris (*Albizia spp*); Bhilar; Simal (*Bambax ceiba*); Gular (*Ficus spp*); Khari (*Celtis spp*) are increased. Rattan forest provides good habitat for many types of fauna. It was reported by the CFUG persons that some endangered wild animals such as Python, Bengal tiger, leopard, sloth bear have increased and casualties were reported in time to time. In 2016, there were 9 Pythons in SCKF, 7 Python (*Python molurus*) in SCF with new babies reported. Various types of wild honey bees are making hive in the rattan forest. Sometimes, rhinos and elephant are also coming to the forest. Besides, there are wild boar, chital, Tiger(*Panther tigris*), Nilgai(*Bos javancus*), Peacock / Peafowl(), Dove (*Family- columbidae),* Parrot (Cukoo (Family-Cuculidae); Rabbit, Mongoose, Goro, Black snake, Jackal, civet cat, squirrel, Muniya bird, small jureli, long tail bird, white tail long tail bird and crane are suitable habitat.

### 4.3. Socio-economic of rattan enterprises

There were 66 cane processing industries in 19 cities by 2008 (Chowdhary and Paudel 2008). Currently there are about 55 rattan processing industries in 17 cities of 13 districts. Based on size and capital investment, highest number of workers employed full time in them are 363. However, the largest rattan processing industries have employed 40 workers and small size industries have employed 3 persons. Each worker earn in an average NRs 240,000 per annum. However skilled workers earn NRs 360,000 to NRs 420,000 excluding residential

facilities. Average earning by large size enterprises is NRs 0.54 million per annum where as NRs 0.42 million by small and medium size of enterprises. There are about 13 selling outlets where cane furniture is sold. In totality, 68 enterprise running who earns NRs 33.33 million per annum. There are 12 CFUGs employed 2-5 forest watchmen and 2-3 staffs. More than 70 persons are involved in rattan selling in fancy shop, transportation, harvesting and trading. With this figure, NRs 52.27 million (US $ 517545) is earning by workers, where as NRs 2.88 million by CFUG and NRs 4.2 million by service providers. Total earning by entrepreneurs, CFUGs and service providers are NRs 59.35 million (US $ 587644) per year. Estimated job creation by rattan subsector in Nepal is presented in Table 4.

Table 4. Enterprise And Job Creation

| Location | Number of processing industry | Number of employment |
|---|---|---|
| Banke | 2 | 9 |
| Bardiya | 8 | 30 |
| Chitwan | 3 | 27 |
| Dang | 1 | 2 |
| Jhapa | 3 | 17 |
| Kailali | 11 | 33 |
| Kaski | 2 | 8 |
| Kathmandu | 25 | 213 |
| Sunsari | 1 | 4 |
| Kapilbastu | 1 | 3 |
| Nawalprasi | 1 | 3 |
| Kanchanpur, Siraha, Fancy shops, Hardware | 10 | 30 |
| Total | 55 | 379 |
| CFUG | 10 | 30 |
| | Sub-total | 409 |
| Part time employed | | 70 |
| Total | | 479 |

There are about 409 persons directly employed where as 70 persons are indirectly employed. In total about 479 persons are employed. Total number of labors could be 30 to 50 percentage more if political situation is stable and no risk of catastrophes.

Interestingly, after earth quake disaster in Nepal, over 60 percent Indian workers have left their job and went back to India. It was the critical period to sustain the rattan enterprise with the limited number of unskilled laborers. In such a condition, most of the entrepreneurs trained their family members, particularly their wife and involved in processing works. On the other

hand, some development organizations provided skill training to women and Dalit community members where Janajati women were leading rattan processing enterprise.

Survey shows that rattan processing industries are increasing in the major cities gradually, where as decreasing rural areas those depending on Nepalese raw cane is facing severe scarcity of cane. Growth trend concluded with reference to 35 rattan processing industries which were surveyed during the study period, shows that 55 to 66 percent rattan industries were increased in the each decade before 2015 (Fig 1). More than 15 rattan processing centers were closed in Birganj, Hetauda, Rajbiraj, Itahari, Janakpur, Banke, Bardiya and Kailali in the past. Among them five rattan industries were closed from 2013 onwards facing continuous scarcity of raw material from community forests caused by IEE and EIA provisions. In addition, some processing industries were collapsed in the earth quake. Supply of Indian rattan was also obstructed due to banning on supply of raw rattan outside India. It is estimated that 30-40 percentage enterprises are opening and closing frequently due to scarcity of raw material and labor shortage (MDBRPP/DFRS 2010).

The field survey of enterprises from 2016 to 2017 shows that out of the 35 enterprise in Nepal, 7 enterprises (20 percentage) were lead by women where as 28 (80 percentage) lead by men. By ethnicity, 7 (20 percentage) were run by Brahmin, 10 (28.6 percentage) by Chhetri, 17 (48.6 percentage) by Janajati and 1 (2.9 percentage) by Dalit. It indicates that Janajatis are higher percentage involved in the rattan industries. Noting that Far Western and Mid-Western Terai of Nepal are dominated by Janajati ethnic group who are involved in rattan processing.

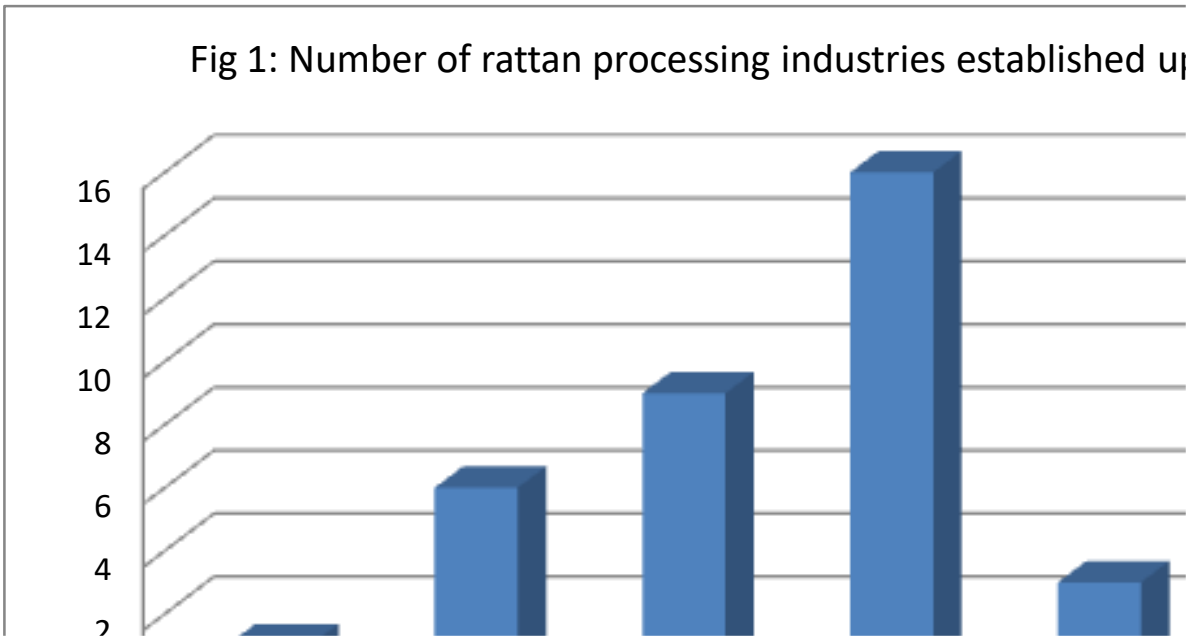

Fig 1: Number of rattan enterprise increased per decade

## 5. RATTAN MARKETS AND THEIR VALUES

### 5.1. Processing industries

In the past, processing industries were confined to major cities. However, number processing industries have reached 66 in 2005 from 42 in 1996. In 2016, number of processing industries running are 55, decreased by 17 percentage. Out of them, 25 processing industries are located in Kathmandu. Other processing industries are located in major cities like Pokhara, Narayangadh, Bharatpur, Kakarvita, Nepalganj, Kohalpur, Rajapur and Dhangadhi. Processing industries located in Birganj, Janakpur, Rajbiraj, Itahari, Hetauda were closed. Further, number of processing industries in Pokhara, Nepalganj, Kohalpur either decreased or closed (Table 5).

Table 5. Rattan Processing Industries In Nepal.

| SN | Cities | Number of processing centers | SN | Cities | Number of processing centers |
|---|---|---|---|---|---|
| 1 | Kathmandu | 25 | 10 | Lahan | 1 |
| 2 | Pokhara | 2 | 11 | Dhangadhi | 4 |
| 3 | Bhairahawa | 1 | 12 | Atariya | 1 |
| 4 | Kakarvita | 3 | 13 | Tikapur | 3 |
| 5 | Butwal | 1 | 14 | Sati | 1 |
| 6 | Narayangadh | 2 | 15 | Sunwal | 1 |
| 7 | Bharatpur | 2 | 16 | Rajapur | 4 |
| 8 | Biratnagar | 1 | 17 | Damak | 1 |
| 9 | Dharan | 1 | | | |
| Total | | | | | 55 |

Irregular supply of raw cane has caused to close and open 30-40 percentage enterprises. Nepalese rattan supply fulfills the demand of 20-30 percentage of the total demand (Thapa et al, 2001). As a result, 17 processing industries of Kathmandu use Nigalo as an alternative raw material combining with cane.

### 5.2 Consumption of rattan

Rattan processing is based on traditional knowledge and skill. Field survey shows that out of the 35 processing industries, 3 (8.6 percentage) are involved in processing only, where as 7 (20 percentage) do selling of products and 25 (71.4 percentage) do both processing and

selling. Some of the processing centers of Kathmandu valley have introduced to some extent. It was found that enterprises of Kathmandu valley combine bamboo (small diameter bamboo-Nigalo) with rattan, those sell their products in the domestic market. According to survey 17 (48.6 percentage) processing industries combines Nigalo and 18 (51.4 percentage) use only rattan. Major rattan species consume in the enterprises are Panibet, Fekrabet, Gauribet, Putalibet, Radan bet, Murgi bet, Dudhiyabet, Manon bet and Rotang bet. Both the large size diameter and small size diameter rattan is mostly imported from India. However some processing industries also imports rattan from Indonesia, Thailand, Malaysia and Singapore. Processing centers located in Kailali and Bardiya districts are fully depended on domestic rattan. *Calamus tenuis* is produced in Nepal at commercial scale which is source of raw cane for them.

Annual consumption of imported rattan from India and other countries ranges 105 to 135 truck, out of them large diameter of rattan ranges 95 to 105 full truck load and small size diameter rattan 30- 40 full truck load, with the value NRs 60 to 98 million (US$ 6 to 9.8 million). Total import of rattan from India is about 95 percentages. Table 6 presents the import of rattan from India per annum.

Table 6. Quantities And Value Of Import Rattan In Nepal Per Annum

| SN | Species | Quantity (truck) | Bundle in a truck (in 00) | Number per truck (in 000) | Number in bundle | Rate in 2071 | Total cost of rattan (NRs in 000) | |
|---|---|---|---|---|---|---|---|---|
| 1 | Gauri | 20-25 | 100-120 | 250-360 | 20 | 500-600 | 5000 | 7200 |
| 2 | Fekra | 40-50 | 100-120 | 200-240 | 20 | 500-600 | 5000 | 7200 |
| 3 | Radan | 10 -15 | 100-120 | 200-240 | 20 | 3200-5000 | 32000 | 60000 |
| 4 | Putalibet | 5 - 10 | 100-120 | 200-240 | 20 | 500-600 | 5000 | 7200 |
| 5 | Dudhiya | 5 - 10 | 100-120 | 200-240 | 20 | 500-600 | 5000 | 7200 |
| 6 | Panibet | 25-30 | 3-4 | 500-600 | 50 | 800 | 8000 | 9600 |
| | Total | 105-135 | | 1550-1920 | | | 60000 | 98400 |

Out of them, Fekri bet is consumed the highest amount, ranging from 40-50 truck followed by Panibet which is about 25- 30 truck annually. However, by number Panibet is the highest number which is 500000 to 600000 where as Fekribet are about 200000 to 240000. Putalibet and Dudhiya bet are less consumed, approximately 8 truck per annum.

### 5.3 Consumption of Nigalo

Nigalo (Bamboos spp ) are blended with rattan. Bamboo is popular in rattan enterprises mainly in Kathmandu valley. According to the survey, 20 rattan processing centers were used the Nigalo at average number of Nigalo 24,500 per enterprises per annum. Nigalo is collected thru

local suppliers from Kathmandu, Lalitpur, Kabhre, Sindhupalchowk, Dhading, Sindhuli, Ramechhap, Nuwakot, Makwanpur and Dolakha districts. According to local people, availability of quality Niaglo has been reduced local area to fulfill the demand of enterprises and demand has been increased due to shortage of rattan. Entrepreneurs therefore purchased rattan from outside districts. There are Nigalo suppliers who take order and supply regularly. Price of Nigalo ranges from NRs 5 to 15 depending on the length and maturity, where as lowest price is NRs 5 and highest prices is NRs 15 per stand. With this estimate, total number of Nigalo used per annum is 490,000 and cost involved is NRs 3,920,000 to NRs 4,900,000.

### 5.4 Consumption of Nepali rattan

Nepali bet was used extensively in the past in Nepal. Panibet is mainly commercially available in Nepal. However, due to administrative cumbersome of Nepali bet by DFO and DDC and National park, Nepali bet is not purchased now. Mainly Indian contractors purchase Nepali bet from the community forests. Nepali bet is long and considered good quality. Nepali bet- roughly 160 to 200 trucks is produced per year from community forests. Hardly, 50-60 trucks are consumed in Nepal, where 1 truck contains in average 350 bundle (1 bundle= 50 piece depending on length and thickness). One quintal cane consists about 4.33 bundle, and 1 kg cane about 2 canes. Selling cost of local dried rattan varies from NRs 60 to 65 for outsiders from the community forest. Hence total cost of Nepalese rattan is NRs 1,400,000 to 1,700,000. Out of them, value of Nepali rattan consumed in domestic market is about NRs 437,500 to 525,000. Value of Nepali rattan exported to India ranges NRs 962,000 to 1,225,000.

### 5.5 Consumption of split rattan

Split rattan is mainly used for binding purpose. There are two types of split rattans – round split rattan and flat split rattan are used by Nepali processors. Split rattans are imported from India, Indonesia, Malaysia and China (via Singapore). Indian split rattan is brought from Calcutta, Siligudi and Susta. Indian split rattan are rough and less quality. Whereas Indonesian and Singapore split rattan are fine and good quality. Cost of split rattan is NRs 900- 1000 and selling price in Nepal is NRs 1500 per bundle in Nepal. However, poor quality split rattan costs NRs 300-500 per bundle. Malaysian split rattan are thinner in size. Consumption of split rattan is about 15 bundles (150 kg) per processing center per annum. Total quantity of split rattan is 5500 kg to 6000 kg and price of it @ of 750 is NRs 4,100,000.

Table 7: Summary of cost of raw material

| Raw material | Quantity (Truck) (Average) | Value | |
|---|---|---|---|
| | | NRs (0000) | US $ |
| Indian rattan | 120 | 7930.00 | 785149.00 |

| | | | |
|---|---|---|---|
| Malaysian, Thai, Indonesian rattan | 6 | 2520.00 | 249505.00 |
| Nepali rattan | 55 | 48.00 | 4753.00 |
| Split rattan | 2 | 410.00 | 40594.00 |
| Sub-total | | 10900.00 | 1079208.00 |
| Nigalo | 70 | 490.00 | 48515.00 |
| Total | | 40949.00 | 1084059.00 |

### 5.6. Market and marketing

Nepal has good opportunity to expand the rattan products in neighboring countries and international market. Nepal can export rattan products in china and India due to population high there and more users. Rattan business needs to be established value chain. More actors are required to be involved in production, processing and trading. India has good market because rattan furniture is also used in offices. High quality rattan products have good opportunity in the international market. According to Rattan entrepreneur Mr Raghu Shah, quality rattan products have about 80 percentage international markets such as USA, France, Germany, and Italy. Marketing is possible by email, catalogue and internet. Nepali consumers do not afford higher price, but foreigners pay higher price if they like the product.

#### 5.6.1 Market

Rattan products have less market potential in Nepal. Very few people use rattan furniture. It is hoped that plastic products are considered more handy and cost effective. On the other hand, government offices use very less rattan products in the office. At the same time concept of biological products and natural product is not widely accepted.

Selling methods of cane items are direct selling by the processors. It was estimated that 27 (77.1 percentage) processors sell directly from themselves, where as 2 (5.7 percentage) sale through dealers, and 6 (17.1 percentage) sale their products through whole sale furniture suppliers. Further 17 (48.6 percentage) processing centers have selling outlet for marketing of their products where as 18 (51.4 percentage ) do not have selling outlet.

#### 5.6.2 Cane marketing and value chain

There were seven value chain actors involved in the value chain of rattan in Nepal. Value chain has again two parts- dependent on Indian and foreign cane, and domestic cane such as Kailali and Bardia District. In this study value chain of Nepalese rattan with some focus to rattan processing industries has been explained.

1. *Input suppliers/ facilitator:* The actor in the value chain of the rattan is government and non-government organizations. Among the government organizations, DFO, District Cottage and Small Industry Office (DCSIO), DDC, Police office and customer offices are major actor. DFO supports for policy implementation through forest operational plan, training to CFUGs for skill development and enterprise formation, promote governance in the CFUGs and raising of seedling in the nursery. DCSIOs support for skill development training. There are government organizations such as TeraiArc Landscape (TAL), Hariyo Ban and Micro-Enterprise Development Programmed (MEDEP) actively supporting to CFUGs for seedling production, networking, strengthening of CFUGs. MEDEP has trained more than 300 local people on micro-enterprise development.

2. *Rattan collectors/ harvesters:* Based on the field survey, there are about 21 CFUGs involved in rattan conservation. CFUGs encourage their users for rattan harvesting during the harvesting time.

3. *Community Forest User Groups (CFUG):* There are 21 CFUGs directly related to rattan forests in Kailali and Bardiya districts. Upon getting the approval of their operational plan and IEE from DFO, they are allowed to harvest rattan.

4. *Village (local) traders/ entrepreneurs:* Village level traders are also the local entrepreneurs who act double function – rattan processing as well as trading to outside the district. They have knowledge of local sources of rattan. They maintain a close relationship with the collectors/producers in their respective working areas. Village level traders purchase rattan from CFUG at relatively cheaper price and process them, and sell their finished products to outside market...

5. *District/ national traders:* District/ national level traders generally take transit and export permits from district forest offices. They have either small depots in urban area or purchase of rattan from CFUG in the bulk basis in collaboration with Indian contractors. They generally visit to CFUGs in time to time and maintain harvesting information and relay it to Indian contractors.

6. *Urban (market hub) traders:* These are traders in Kathmandu, Nepalganj, Taulihawa, Butwal, Bhairahawa and Kakarvita. Urban traders are also rattan processors having strong network with processing industries, Indian market canters and government institutions. Some of the urban traders have processing industries cum rattan depots in other road head cities. They mostly deal with all types of rattan and supply mostly to the traders in major Indian cities.

7. *Indian contractor;* Indian wholesalers have business linkage with traders of Sunwal, Bhairahawa, Kakrvita and Kathmandu. Indian contractors and commission agents are found to control the purchasing price of Nepalese rattan, mainly from Kailali and Bardiya district. Some contractors also retail rattan raw material. Probably the most important centre for trade in raw materials is in the Luknow. Susta, Calcutta, Jorhat, Siligudi.

### 5.6.3 Market of local products

Major furniture are interior decorative items such as various types of chairs, tables, tools, sofa, bed, hanger, book case, baskets, baby cot and handicrafts.

There are five major market centers of cane products in Nepal, e.g. Kathmandu, Pokhara, Chitwan, Kakarvita and Midwest Nepal. Kathmandu is the largest market center followed by Chitwan and Pokhara. From Kathmandu, Pokhara and Chitwan market centers cane products are sold to hotel and restaurants and household purposes. Based on the consumers, there are four types of consumers of cane products- domestic users, hotel and restaurant, offices and foreigners. Approximately 25-30 percentage cane furniture are used by household users, 30-35 percentage furniture consumed by hotels and restaurants and 5-6 percentage furniture are consumed by foreigners living in Nepal including foreign export- 5-6 percentage. High quality Nepalese furniture is exported to Germany, America and Japan. About 50 percentage cane products are sold to Pokhara and 30 percentages to Chitwan, mainly by tourist lodge and restaurants from Chitwan market center, where eastern Nepal such as Kakarvita sells about 60 percentage cane products to Kathmandu and 40 percentage to neighboring cities.

In the far and mid west of Nepal, *Calamus tenuis* is used for furniture making. Local entrepreneurs prefer *Calamus tenuis* for processing of all types of furniture items such as chairs, tools, hanger, baby cot and sofa. Hanger, tools and baby cots are highly consumed by local users. There are nine major cities in the mid and far west of Nepal namely Nepalganj, Kohalpur, Surkhet, Ghorahi, Tulsipur, Dhangadhi, Atariya, Mahendranagar and Dadeldhura. According to entrepreneurs of mid and far western Terai of Nepal, 20 percentage finished products are sold to Kathmandu, 10 percentage to Dadledhura, 10 percentage to Nepalganj, 10 percentage Dang , 30 percentage domestic use and 20 percentage to Mahendranagar.

### 5.6.4 Marketing channel

In Nepal, although, rattan is available in protected areas (e.g. national park and wildlife reserves), community forest and institutionally owned areas (e.g. school, herbal farm, religious groups) and government forest, only rattan of community forests are commercialized. This marketing channel explains both Nepalese and Indian rattan including foreign exports. It is estimated that 165 to 195 truck rattan is consumed per annum. Of the total quantity, 90

percentage rattans are imported from India and 5 percentages from other countries. In the India Arunachal, Assam, Siligudi, Silapathar, Nagaland, UP and Bihar (Susta) is the major places to supply rattan in Nepal. Small size and large size diameter rattan is imported from these places. But some high quality and large size rattan is imported from Indonesia, Malaysia, Thailand and Bhutan. Approximately 3-5 truck rattan from these countries is imported. Such quality rattan is utilized by only limited processing industries of Kathmandu those who targets international markets of their finished products. Community Forests of Kailali, Bardiya and Dang have produced Panibet (*Calamus tenuis*) in commercial scale. Although some community forests of Chitwan, Nawalprasi and Kapilbastu have produced Panibet, but supply is not regular and quantity is not known. Approximately 160 to 200 trucks Panibet is produced in community forests of Kailali and Bardiya, out of which 50-60 truck cane is consumed in Nepal, which is about 35 percentage, mostly by local processing industries. Few years ago, Nepalese rattan was highly preferred by Kathmandu processing industries due to high quality cane. It is estimated that 2-3 percentage of 110 to 140 truck Nepalese rattan again come back to Nepal from India mixed with Indian rattan. Split rattan is mainly imported from Indonesia, Malaysia and China through Singapore. Approximately 5500 to 6000 kg high quality split rattan is consumed by Nepalese processing industries except low grade split rattan coming from various parts of India.

Out of the total production of rattan items, 95 percentages is consumed in Nepal and 5 percentages is exported to foreign countries such as USA, Germany, Italy and France. Previously rattan items were also exported to Canada and Australia. Among the 95 percentage consumed in Nepal, 25- 30 percentage is consumed for household and 30-35 percentage to hotel and restaurant (Fig 2).

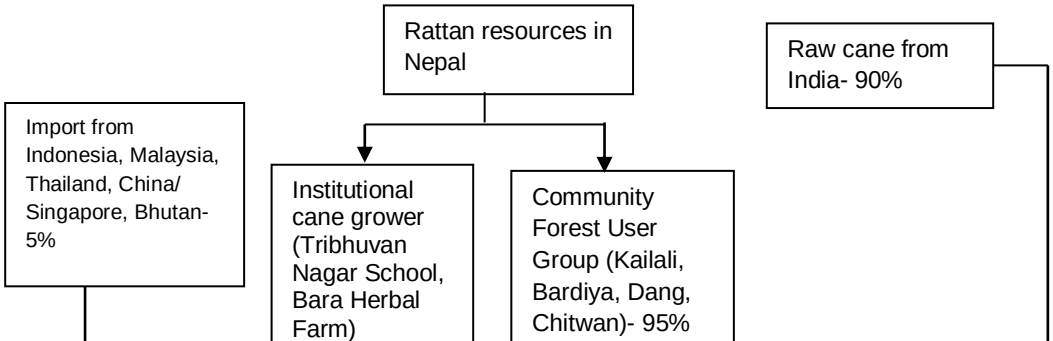

Fig 2: Marketing channel of rattan in Nepal

### 5.6.4 Cost of production

Cost of production of green rattan is estimated up to NRs 28- 30 per kg in the community forest. This cost includes harvesting and transportation up to nearest seasoning place. According to Forest Act, CFUGs can fix the price of products. Therefore, rate of rattan is also fixed by CFUG itself. Due to shortage of rattan in the market, contractors pays higher price of raw rattan. In the Kailali district, stocked rattan was sold at the rate of NRs 5700/ quintal against NRs 5500 tender rate.

In case of finished products from imported rattan from India, cost of production and selling price varies about 50 percentages due to distant from the market centers, availability of raw material, storage capacity and market condition. According to entrepreneurs, if products is immediately sold after the finishing, there is likely to 90 percentage profit, and if stored for long time, get loss. On the other hand, Nigalo mixed items are comparatively cheaper. It was

found that some of the entrepreneurs store goods in the warehouse more than eight years since rattan products does not deteriorate even after eight years in the warehouse. Longer the period of storage of finished goods means that financial flow is locked and profit margin is get less.

Price of cane has been increased continuously by 10-15 percent each year. Importing cane from India is risky job since export was banned by the Government of India. There are many formalities to address in the route such as check post, taxes etc during the transportation. As a result prices of raw cane increased sometimes 4-5 times of the farm gate price (Thapa et al 2001). On the other hand, there are no securities and incentives to cane industries from government of Nepal. Increase in price of petroleum products; ultimately increase the price of transportation. According to traders, rattan resources in major production area of India- Assam and Arunachal Pradesh has also been decreased. Rattan traders say that price of raw material was increased NRs 15 in 2015 and NRs 17 in 2016 per kg. In the past few years, political instability in Nepal caused frequent road blockade by various political parties which lead to risk to transports and increased heavily price in transportation.

### 5.6.5 Manufacturing cost

Manufacturing cost depends on the size of items which consumes resources, time and market prices. Smaller the items, less the price, bigger the items higher is the price. For example, Bangle stand is simple and small items that has less cost of production, where as sofa set is the large items that consumes more rattan resources and time. Table 8 presents the cost of production that includes consumption of raw material, labor and auxiliary material.

Table 8: Cost of production of Rattan Products.

| Rattan products | Cost (NRs) | | | |
|---|---|---|---|---|
| | Raw Rattan | Labor | Auxiliary materials | Total cost |
| Bangle stand | 60 | 80 | 25 | 165 |
| Bed | 2200 | 300 | 225 | 2725 |
| Chair | 500-600 | 200 | 40 | 727-825 |
| Cloth stand | 215 | 120 | 25 | 360 |
| Cradle | 300-350 | 200 | 40 | 540-590 |
| curtain ring | 100 | 80 | 20 | 200 |
| Flower basket | 120 | 150 | 35 | 250 |
| Light cover | 40 | 25 | 10 | 75 |
| Mirror frame | 300 | 300 | 50 | 650 |
| Planter | 100 | 100 | 20 | 220 |
| Racks | 600 | 200 | 50 | 850 |

| | | | | |
|---|---|---|---|---|
| Sofa –set (simple set) | 4000-4500 | 1500-2000 | 200 | 5700-6700 |
| Stool | 125-150 | 100 | 25 | 250-275 |
| Tea table | 400 | 100 | 30 | 530 |

Source: MDBRPP/ DFRS 2010

### 5.6.6 Marketing margin of rattan products (in percentage)

A study conducted by MDBRPP/ DFRS in 2010 shows that proportion of marketing margin of rattan products ranges 45 to 66 percentage of the final price. Producers share the benefits ranging from 10-30 percentages where as wholesalers share benefits within 6- 15 percentage of the consumer price, and the retailer have 10- 21 percentage benefits (Table 9).

Table 9: Marketing Margin Of Rattan Products (In Percentage)

| Rattan products | Cost (NRs) | | | | |
|---|---|---|---|---|---|
| | Production cost | Producer | Wholesaler | Retailer | Total |
| Bangle stand | 50.00 | 26 | 10 | 14 | 100 |
| Bed | 56.00 | 25 | 8 | 11 | 100 |
| Chair | 49.00 | 20 | 14 | 17 | 100 |
| Cloth stand | 50.00 | 30 | 10 | 20 | 100 |
| Cradle | 50.00 | 25 | 10 | 15 | 100 |
| curtain ring | 45.00 | 30 | 11 | 14 | 100 |
| Flower basket | 50.00 | 25 | 9 | 16 | 100 |
| Light cover | 65.00 | 10 | 8 | 16 | 100 |
| Mirror frame | 59.00 | 22 | 9 | 10 | 100 |
| Planter | 62.00 | 18 | 6 | 14 | 100 |
| Racks | 60.00 | 20 | 8 | 12 | 100 |
| Sofa –set (simple set) | 40.00 | 30 | 9 | 21 | 100 |
| Stool | 48.00 | 25 | 15 | 12 | 100 |

| | | | | | |
|---|---|---|---|---|---|
| Tea table | 55.00 | 25 | 8 | 12 | 100 |

Source: MDBRPP/DFNRS 2010

### 5.6.7 Selling methods

Rattan items are sold by cash and advance taking method. Cash is method in which goods are sold taking cash immediately after sell. Advance is the method in which at least 25 to 50 percentage cash is taken during the order taking time. Retailers sell their products in cash method, where as wholesalers sell in advance methods. Mostly rattan products are sold in cash.

### 5.6.8 Interest of customers

Most of the customers are concerned about latest design and good quality furniture. However, price is the next major concern that low price is bargaining point of the furniture while purchasing the goods. On the other hand, only few processors are competent for quality furniture due to lack of skilled labor availability. Even the processors agree that quality of rattan furniture's are decreasing in recent days.

Rattan furniture's are sold mostly through outlets. Customers purchase rattan furniture preferring cheap, quality and attractive. However, strong furniture's are preferred by most of the customers. Some customer complains for quality and some bring furniture for repairing in the processing centers. Processors are proud of the rattan processing thinning that they are selling the domestic goods rather than the foreigner goods.

## 5.7 Demand and supply of rattan

In totality, rattan processing industries use large size diameter and small size diameter rattan including Nigalo. Nepalese processing industries estimate consumption of rattan by truck load and bundle. Annual consumption of rattan is based on estimate that one truck contains 350 bundle which is about 6500- 7000 stems.

Annual consumption of imported rattan from India and other countries ranges 105 to 135 truck, out of them large diameter of rattan ranges 95 to 105 full truck load and small size diameter rattan 30- 40 full truck load, with the value NRs 60 to 98 million (US$ 6 to 9.8 million). Total import of rattan from India is about 95 percentages.

Total demand of cane in Nepal is around 300 to 400 truck. It means deficit of cane supply is approximately 150 to 200 trucks per annum.

Total production of rattan in community forests is about 150 to 200 truck. Due to variation of length and diameter, Nepalese rattan is less number in a truck. Length of Nepalese rattan is relatively longer with medium size diameter. Before 10 years, Nepalese rattan was hope of good source of raw material for processing industries. However, in recent years potentiality of harvesting Nepalese rattan is trapped only 10 to 15 percent. It indicates that 85 to 90 percent rattan is not harvested due to IEE and EIA, expiry of Forest Operational Plan (FOP), administrative hurdles.

Rattan forests have been increased tremendously in the community forests of Nepal from last 10 years. It is estimated that total production will be some 500 to 600 truck per year if regulated the proper harvesting mechanism. It will fulfill the demand of 70 to 80 percentages except demand of large size diameter of rattan.

Large diameter rattan such as Fekrabet, Gauribet and Dangre bet is also found in many places of hilly areas. There are some 10-15 forest area of such large diameter bet throughout Nepal. If they are managed, some 5-10 truck stems could be harvested yearly after 5 years.

There is no separate trade data of rattan available as bamboo and rattan is combined together in the trade data list. The Trade Promotion on Centre (TPC) data shows that bamboo and rattan products exported to the western market are 7,8,3,30,11,1,1 metric tons in 2000, 2001, 2003, 2004, 2006, 2007 and 2008, respectively. It indicates that the highest export is in the year 2004 and the lowest in 2007.

## 6. MANAGEMENT PRACTICES

### 6.1. Management initiatives

Scientific management practice of rattan is limited to very few community forest of Nepal. Only few CFUGs have commercialized rattan as it its management is the pure technical and local communities may not have adequate knowledge about this. However, management of rattan in Nepal is one of the models in the world due to participatory and distribution of benefits to their users.

With the concept of community forestry evolved in 1990s in Nepal, Forest Act 1993 and Forest Regulation 1995, which aimed to empower the community forest user groups, are main legal instruments functioning of them (Chowdhary 2003 and 2004). Rattan has been prioritized as NTFP and management methods are prescribed in the Forest Operational Plan (FOP). The participatory rattan management was pioneered from Sati Karnali Community Forest User Group (SKCFUG), Sati, Kailali in 1996. A separate management plan, which was called

Rattan Management Plan (RMP), was incorporated in the FOP to legalize the harvest of forest products. After the successful implementation and results achieved by SKCFUG, the RMP was also prepared for Shiva and Sarswoti community forest of Rajapur Bardiya. Gradually the RMP was replicated by some neighboring CFUGs to manage rattan. All the RMP includes detail inventory of growing stock, regeneration, harvesting methods, yield regulations, bock division, post harvest techniques, tending operations, marketing and enterprises development, and income generation activities (Paudel and Chowdhary 2005).

Community forestry in Nepal has begun from indigenous knowledge, custom, culture, and practices. Rattan is also one of the products within the community forests. Therefore scientific utilization of timber, fodder, NTFPs including rattan are significant. However, due to availability of rattan in limited community forests, attention to be paid for managing rattan in them. On the other hand, the indigenous management system has improvised by technology which is called improved management system. Improved management is the product of successful result of value added technology, thoughts and training in indigenous knowledge. Under the improved management system, block management, rotational harvesting, systematic storage etc. are included. Moreover, improved management practice also enforces of enrichment plantation, inspection path and silvicultural operations as required. The table 10 describes difference between indigenous management and improved management practices.

Table 10. Indigenous Management and Improved Management Practices of Rattan.

| Activities | Indigenous management | Improved management |
|---|---|---|
| Seed collection | Seed was collected only by some individual rather than community people. Generally seed was collected in the month of February and May | Local people harvested rattan without caring maturity. Rattan was harvested annually or bi-annually, which stopped fruiting. After introducing improved technology, they allow to cut at least in 4 years. |
| Nursery | There was no practice of rattan propagation in community nurseries. Only wild seedlings were collected and planted in the bund of private farm lands. | After rattan management training conducted in the community, one rattan nursery was established. The community planted seedling their own forest and sold the surplus ones. |
| Seed treatment | Local people were unaware of seed treatment technologies. However, some farmers used to remove sarcotesta of the rattan fruit. | In order to treating rattan seeds, practice of soaking 24-48 hours in water before sowing in the bed was adopted. |
| Rattan | Rattan plantation work was not | Naked community lands and sparse forest |

| | | |
|---|---|---|
| plantation | done due to lack of seedlings. | was planted or enriched with rattan seedling to cover the entire area. |
| Conservation | Forest watchman used to protect the community forests. Rotational guarding system by local people was common practices to conserve forest. | Forest was managed as per RMP and FOP and constitutions which became very much effective in case of rattan. |
| Tending operations | Tending operations were not carried out in the forest for the improvement of forest health. | Afforestation was done in the degraded land and tending operation carried out as required. |
| Rattan harvesting | Rattan was harvested by traditional methods as well as Indian contractors used to harvest rattan employing their own laborers. They generally lit fire before harvesting rattan which damaged rattan to seriously. | Block management started and discouraged firing before harvest. Local people employed in harvesting job, adopted operations for minimizing loss of regeneration due to unsystematic harvesting. |
| Post harvest | There was no any post harvest technologies developed | Drying, bundling, storage and weighting practice started for value addition and fetching good price. |

Source:M S.K Paudel and C.L.Chowdhary, 2005

With this efforts, about 211 hectare of rattan forest from 22 community forests are managing natural rattan. The area mentioned in the table 11 is only the rattan area within the community forest. Therefore, there is ample potentiality to increase the rattan area in the same community forests. Size of rattan forests are ranging from 0.06 to 155 ha. There are some more area not covered in the list.

Table 11: Community Forests Having rattan in Nepal

| SN | District | Location | Area (ha) | Remarks |
|---|---|---|---|---|
| 1 | Kailali | Sati Karnali CF | 155 | Natural |
| 2 | Bardiya | Dange community forest, Humna Village, Rajapur NP | 1 | Natural |
| 3 | | Gauri CF, Rajapur NP, Dalaima | 0.133 | Natural |
| 4 | | Laligurans CF, Rajapur, Ward no 10 | 1 | Natural |
| 5 | | Lathawaha CF | 10.5 | Natural |
| 6 | | Shanti CF , Rajapur, 13, | 4 | Natural |
| 7 | | Sarswoti CF, Rajapur | 2 | Natural |
| 8 | | Ganesh baba CF, Rajapur 13 | 1 | Natural |

| | | | | |
|---|---|---|---|---|
| 9 | | Sidha Baba CF, Rajapur 13 | 2 | Natural |
| 10 | | Phulbari CF, Rajapur 6 and 10, | 1 | Natural |
| 11 | | Badalpur Shakha Thulo CF, Rajapur 3 | 1 | Plantation |
| 12 | | Tharu CF, Gualriya | 5 | Natural |
| 13 | | Shiva CF, Suryapatuwa | 4 | Natural |
| 14 | | Durga CF, Suryapatuwa | 4 | Natural |
| 15 | | Sonaphanta CF, Suryapatuwa | 9 | Natural |
| 16 | | Lalali CF, Suryapatuwa | 4 | Natural |
| 17 | | Ayodhyaphanta CF, Suryapatuwa | 4 | Natural |
| 18 | Chitwan | Gobreni CF | 0.06 | Natural, |
| 19 | | Jayshree CF | 0.06 | Natural, |
| 20 | | Gyaneshwar CF | 1 | Natural, |
| 21 | | MangalpurCF | 1 | Natural, |
| 22 | Dang | Gobardiha | 10 | Natural |
| | | Total | 211.70 | |

Source: Chowdhary and Paudel 2008, field survey 2016-2017

In the nutshell, efforts to in-situ conservation of rattans has drawn attention of peoples participation, managing forests, environment and genetic conservation. In this regards, rattan should carefully managed as priority resources. In-situ conservation was promoted by strengthening management practices as follows.

- Some CFUGs (in Kailali, Bardiya, Dang, Nawalprasi, Chitwan and Sarlahi) have hired forest watchmen to control the entry of outsider for forest products such as NTFP, and rattan collection and grazing.
- Some CFUGs (Sati Karnali, Sarswoti, Shiva, Lathahawa) have imposed fine system for users and outsiders. Fine ranges from NRs 500 to NRs 10,000 if rattan including other NTFPs are collected illegally from the community forests.
- Some FUGs (Sati Karnali, Sarswoti and Shiva) have decided to go for rotational collection in 5-6 years interval allowing only harvesting as per FOP.
- From the government side, a lot of awareness raising and management capacity strengthening trainings were conducted.
- DFO, NGOs and various projects have prepared management practices for the rattan and biodiversity.
- Optimal harvesting coefficients have also been established for the rattan harvesting.

### 6.2 Rattan Cultivation

Cultivation and domestication of rattan is emerging practice in Nepal. However, cultivation of rattan has been practiced since the long ago in Indonesia, Malaysia, Thailand and China. In some countries, rattan cultivation as agroforestry system has been started in the community land (Weinstock, 1983; Connelly, 1985, Siebert and Belsky, 1985; Pluso, 1992). Producers can also directly sell raw rattan to the market. After the world war, there was acute shortage of raw rattan in the market due to increase in price of them. It encouraged people to cultivate rattan in the commercial scale and increase productivity applying silvicultural treatments. Even now, many rattan farm lands are under the possession of Department of Forest and private companies in rattan growing countries. Local people are getting real prices due to this system (Belcher 1999). Currently, rattan cultivation is done with oil palm in Bangladesh, Cameroon, China, Indonesia, Kenya, Malaysia, Philippines, Shrilanka and Thailand. According to Weinstock (1983) rattan farming is done as agroforestry with oil palm in African countries. In this methods, farmers can get income within 7-10 years from rattan as they have to wait more than 30 years to take benefit from trees.

Rattan is considered major NTFPs contributing in the national economy of in Malaysia, Indonesia, Philippines, Thailand. Rattan has been commercialized and cultivation is done in the large scale. Further, research works have been carrying out in the management aspects there. According to Belcher(2005)rattan is one of the major source of income for farmers of in Sweden. Farmers earn income from rattan in the famine.

In Nepal, rattan domestication has not commercialized yet in the private scale. Although, increasing interest of NGOs, CFUGs and DFOs, rattan farming has been prioritized as a major NTFPs in the community forests. As a result rattan has been domesticated more or less in 25 districts (such as Sarlahi, Mahotari, Chitwan, Kapilbastu, Nawalparasi, Surkhet, Banke, Bardiya, Kailali, Jhapa, Morang, Dadeldhura). Many CFUGs have raised rattan seedlings in the community nursery and planted in the community forestry. Some nurseries have also been established in the private sector (such as Manman Nursery Bardiya) and planted in the community lands.

### 6.2.1 Cultivation in community forest

The community based rattan conservation in Nepal started about 10 years ago in Nepal. During this period, community people have been familiarised about the social and economic importance, marketing systems and contribution of rattan in biodiversity. Therefore, rattan seedlings have been raised in many communities and private nurseries, cooperation and networking among NGO/ INGOs and CFUGs have been increased for rattan conservation, replication of learning's to neighboring districts, CFUGs and increased the income due to rattan selling in the other neighboring CFUGs. The rattan conservation work was pioneered in the far western Terai district such as Kailali of Nepal. After 5-7 years, this approach was also transferred to central and eastern district of Nepal. By now Kailali, Bardiya and Banke district

have notable progress in this regards. Now, some publications and technology transfer works are being carried out in Nepal.

After 1995, when preliminary survey was done, and series of research and awareness activities were carried out about rattan in the following years, many community forest user groups became interest and foresters and NGOs encouraged CFUGs for plantation. As a result, 44 hectare rattan plantation is possible in 28 community forests.

Table 12. Rattan Domestication in Community Forest

| SN | Community forest | Address and location | Estimated area (ha) | Types of plantation |
|---|---|---|---|---|
| 1 | Ranighat | Kohalpur-5, Banke | 5 | Plantation |
| 2 | Girija | Udrapur-2, Banke | 2 | Plantation |
| 3 | Dalithit | Kohalpur-4, Banke | 1 | Plantation |
| 4 | Baijapur | Samserganj-8, Banke | 1 | Plantation |
| 5 | Jyoti | Kohalpur-9, Banke | 1 | Plantation |
| 6 | Sarswoti | Kohalpur-1,2, Banke | 1 | Partial Plantation |
| 7 | Tharu | Balapur-, Bardiya | 3 | Plantation |
| 8 | Santosee | Gulariya, Bardiya | 1 | Plantation |
| 9 | Chhatiya | Geta-3, Kailali | 1.5 | Partial Plantation |
| 10 | Ramjanki | Chhinchu, Surkhet | 1 | Partial Plantation |
| 11 | CFUGs | Tuteshwasr Mahotari | 1 | Partial Plantation |
| 12 | Bihani | Sarlahi, Murtiya | 0.5 | Plantation |
| 13 | Binayi CF | Nawalprasi | 2 | Partial Plantation |
| 14 | Janahit Mahakali CF | Kanchanpur | 3 | Plantation |
| 15 | EKta CF | Kanchanpur | 2 | Plantation |
| 16 | Jaya Laxmi Ediwan | | | Plantation |

| | | | | |
|---|---|---|---|---|
| | Durgadevi Parsuram Nuwakot Patal | Dadeldhura, Jogbuda | 6 | |
| 17 | NA | Dakshinkali, Kathmandu | 2 | Plantation |
| 18 | Shankar jyoti | Barkalpur, Nawalprasi | 0.5 | Plantation |
| 19 | Gaurishankar | Barkalpur | 1 | Plantation |
| 20 | Hariyali | Barkalpur | 0.5 | Plantation |
| 21 | Sidhartha | Barkalpur | 1.5 | Plantation |
| 22 | Pandey Dihaba | Barkalpur | 0.5 | Plantation |
| 23 | Janchetna | Hariharpur | 3 | Plantation |
| 24 | Ram Laxman | badubuya | 2.5 | Plantation |
| 25 | Kisan | Barkalpur | 0.5 | Plantation |
| 26 | Sayapatri | Krishnapur | 1 | Plantation |
| 27 | Gwalabari | Krishnapur | 1 | Plantation |
| 28 | Gwali | Krishnapur | 1 | Plantation |
| | Total | | 44 | |

Source: Chowdhary and Paudel 2008, field survey 2016-2017

The table shows that CFUGs are not only managing natural rattan, but also domesticating in the community forest land. Plantation is in increasing trend in the community forests. The size of plantation is 0.5 to 5 ha in the community forest.

### 6.2.2 Cultivation in private land

Private plantation of rattan is very less in Nepal. However, those farmers who have cultivated rattan in Nepal, have received technical, financial and material assistances from projects. There are very less number of farmers who have cultivated rattan with their own initiation. Farmers have collected rattan propagating materials either from other farmers or nurseries. Some of them have protected natural rattan in their farms. No farmers have cultivated rattan

in commercial scale. It was interesting to rattan private farmers that they plant rattan with great hopes of financial income, later on they use such rattan only for household items such as basket, split rattan, stick. They feel difficulties harvest rattan due to lack of harvesting techniques and afraid of the rattan vines, spines and clumpy behaviors. Finally they destroy whole clump. There were three farmers who were supported rattan seedlings and technology to cultivate in the beginning. They grew rattan into the forest, but destroyed completely later on.

Concluding that ex-situ conservation practiced in community forests and private lands, under which various rattan species from various geo-ecological zones were collected, some exotic rattan species were also collected from foreign countries and demonstration plots are developed to perform the best result.

- Enhancement of awareness of the CFUGs on the basis of their realization that rattan maintains high level biodiversity and income opportunities. However, there is no initiation lead by DFO and NGOs to domesticate in the private lands.
- DFO, DFRS and other NGOs supported for seedling production of rattan in the government nursery and community nursery
- Building technical capacity of the CFUGs about the cultivation practices of rattan through appropriate training packages
- Providing planting materials (seeds and saplings) without charge to the interested growers and technical services on the establishment of farm.
- Some private nurseries have also produced rattan seedling in the nursery and sold to farmers.

### 6.3 Management interfaces

There are 3 types of institutions involved in rattan conservation, management and utilization in Nepal. They are community forest user groups, district forest office and civil society. Community Forest User Groups prepare local rules and norms for managing and utilizing of resources; and implement the approved rules for the enhancement of resources. Forest operational plan (FOP) and constitutions are important document which explain management prescriptions and local rules under the government policies. On the basis of these policies, CFUGs sustainably manage and utilize the forest resources. District Forest Office (DFO) is the government agency who facilitates CFUGs to prepare inventory of forests and resource, mapping them and prepare FOP and constitutions as per forest act, regulation and guidelines, and also helps them to guide for the capacity development activities. Besides, DFO also monitors the implementation activities ad progress of over all performances of CFUGs. Civil

society is the third stakeholder involved indirectly in the management of rattan. Civil society also facilitates CFUGs for research works, technology transfer, network, marketing development and financial assistances to them. Moreover, civil societies also advocates for equity distribution of benefits. The picture 4. explains brief roles and responsibilities of CFUGs, DFO and civil society for the resource management.

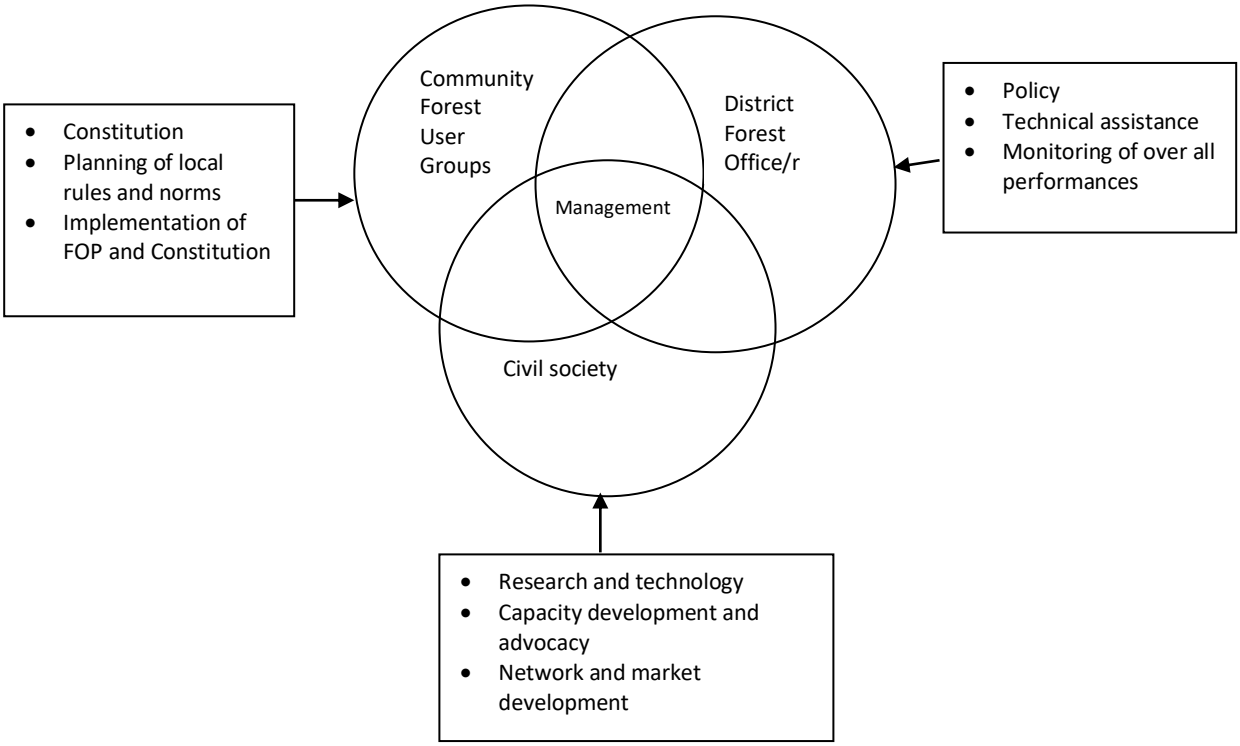


Fig 3: Interfaces of rattan management

## 7. RATTAN: CONTRIBUTE TO GREEN ECONOMIC DEVELOPMENT IN NEPAL

The pursuit of a 'green economy' received a substantial push at Rio+20 and is now centre stage in efforts to design post-2015 development frameworks. But there was divergence at Rio+20 between the hopes of agro-industries for the creation of a bio-economy in which large-scale corporations would increasingly provide agricultural commodities, biofuels, construction materials and the chemical building blocks of a new range of non-petrochemical bio-products; and the hopes of local forest rights holders for the local provision of food, energy and construction materials to strengthen communities and their resilience in the face of environmental and economic shocks (ANSAB 2010).

About 12 percent of the world's population have ecological, socioeconomic, spiritual, and cultural significance (Schild 2008). Mountain ecosystems are among the most varied and richest in the world terms of species (e.g., Vare et al. 2003; Moser et al. 2005; Spehn and Korner 2005).

Traditional societies have developed and maintained vast knowledge and experience on the use of natural resources including plant resources. Much of the rural economic activities are based on unsustainable use of natural resources, resulting in deforestation, loss of biodiversity, and degradation of natural habitats. Cultural and traditional knowledge and values are also fast vanishing. Proper documentation and screening of traditional knowledge on natural resource management and use can improve forest resource management.

Sustainable use and management of biodiversity resources such as NTFPs is a high-priority topic in sustainable development agenda. In recent years, the environmental and economic roles of NTFPs are becoming increasingly significant owing to better understanding and appreciation of their role in promoting low-carbon economic growth. Growing market preference for green and natural products and emphasis on efficient and sustainable use of natural resources has also highlighted the added importance of NTFP development. In recent years, NTFPs have gained much needed recognition along with the realization of the need to conserve forests and protect the trees and wild animals. In many countries, proper harnessing of NTFP resources has been providing a powerful incentive to local communities to protect forest tree cover while harvesting forest undergrowth only. In fact sustainable management of NTFPs has been helping to achieve sustainable management of forest resources in many countries (Karki and Bhattarai 2012)

### 7.1. Current status of the knowledge in Rattan management

Rattan is widely recognized as an important commodity, indeed the "flagship" NTFP for income and employment generation at many levels. This includes raw material production,

transport, trade, processing, manufacturing and export. Rattan is critically important in rural livelihood strategies as a primary, supplementary and emergency source of income and as a source of capital for agricultural inputs. Rattan collection complements agriculture in terms of seasonal labor and is especially important for young households as a bridge to other livelihood activities (FAO 2000). Rattan as an NTFPs is increasingly considered high-value ecosystem goods and services that can transform the economies of forest-rich developing countries into low-carbon or green-growth-based economies (Karki and Bhattarai 2012). Community forestry programme has brought a positive change in the conservation and management of forest resources, including the management of non-timber forest products such as rattan. A few community forest user groups (CFUG)have emphasized rattan as a priority resource to conserve and manage in the community forests (Paudel and Chowdhary 2005).

## 7.2. Livelihood importance of rattan

There is very little involvement of forest communities and indigenous people in the management and development of rattan resource. Inclusion of these people and giving them long-term user rights would go a long way in the sustainable management of the resource (FAO 2000). Rattan provides adequate income to community forests user groups sharing benefits to poor, youths, disabled persons, vulnerable and entrepreneurs to uplift their income generation capacities. It has not only income opportunity but also raw material for construction, decorative, medicinal, edible environmental, biodiversity and cultural and religious importance's. Numbers of rattan forest have been increased through conservation and plantation in neighboring and distant forest to replicate the success of rattan forest. Many social development works such as schools, health post, road improvement, old age houses, communication centers and sanitation activities are supported by rattan income. Towards greening the forest and ecological benefits, plantations, nursery, biodiversity parks and adaptation activities have been supported.

Rattan is not isolated with other forest products, but NTFPs such as bamboos also used in rural and urban homes for construction and manufacturing purposes, and are traded in local, regional, and international markets. The role of the medicinal and aromatic plant resources in the economy of developing countries becomes even greater when high-value service sectors such as health, neutraceuticals, organic and certified products, and ecotourism are taken into account and linked to overall sectoral development of forest conservation and development (Karki 2003, 2004; Karki et al. 2004);

## 7.3. Market potentials and constraints

Rattan has been used traditionally in the world from long ago. It has great contribution in South East Asian Countries. According to Dransfield (2003), more than 70 million people are

involved in the cane trading and cane related jobs in the world. Rattan furniture shares about 4percent of the total furniture in the world and 25 percent in Asian countries (liese 2003; FAO 1998). In Nepal over 600 people are involved in fulltime rattan trading and other jobs. It is clear that NTFPs including rattan, besides providing multiple intangible benefits, also have huge economic potential and generate cash incomes, particularly for women and families that do not have access to agricultural lands and major markets, particularly in developing countries. However, the inadequacy of market-related information and negotiation skills with the upstream producers in dealing with market forces, as well as unequal power relationships or lack of a level playing field between buyers and sellers, disadvantages the growers, collectors, and local traders of NTFPs in Nepal. The supply chain of rattan products is unnecessarily long, with a large number of commission agents eating into the returns that could go to the farmers. These are the major obstacles to the small-scale producers and growers of rattan that prevent them from benefitting from higher values. Forest users, landowners, harvesters and processors, and policymakers can influence how NTFP resources are managed through the knowledge, practices and policies they suggest, design and implement, if they can all work within one single framework linking producers to markets and consumers.

Despite, the annual revenue from the sale of more than 33,000 tones of NTFPs is estimated to be between 13 and 26 million USD (GoN 2010), bamboo and rattan are not counted. Rattan are collected through community forests and bamboo through private owners. The NTFPs are the major exports of Nepal. Nepal however also is one of the biggest consumers of processed medicinal products, most of which are imported from India, which is growing at an annual rate of 20 percent, (Ghimire et al. 2008a,b). Rattan although yet to be counted into contribution of forestry sector in Nepal despite there is a tremendous possibility of improved management, processing, and value addition of rattan l products in Nepal that can help alleviate poverty by creating income generating opportunities locally .

### 7.4. Green economy: key issues in rattan sub-sector

To date, there is no unified view among the rattan producing countries on what represents and drives a green economy and there is also no clarity on what it means for the rattan. The green economy concept offers ample opportunities for application in livelihood and ecosystems since many countries are already largely low carbon or green. There is therefore a need to come up with specific and strategic approaches to implement green and low-carbon economy concepts in the Terai and hills, and to identify opportunities from developing and least-developed country contexts for promoting green economics. There is also a need for new global policies and finances to support poverty reduction and sustainable development through green economics and good governance solutions. The key outcome that can be desired for mountains in a green economy is an ecosystem services-based economy that is both pro-poor and pro-growth and addresses the issues of ecological fragility, social inequity (creating employment for the poor and reducing inequality and marginality) and economic development

(by reducing poverty and costs of living) through interventions owned and managed by mountain communities and supported by national and regional agencies.

There are also risks and constraints in promoting green economics on a mass scale. Green and low-carbon solutions need to create jobs, help produce surplus quality products, promote access to national and international markets, and prioritize poverty reduction, good governance, and equity in the supply/value chains.

### 7.5. Green economy: opportunities through rattan management

The green economy we talk about today has been around for a very long time. Communities and societies in forest- and biodiversity-rich developing countries that were forced by technological and other resource constraints and by the inaccessibility, marginality, and fragility of their environment to live at subsistence level have developed cultural norms, social contracts, and management systems to ensure their livelihoods and the sustainability of the resource base. The original idea of the green economy as developed by ecologists and environmentalists was largely

Specifically to address this situation in Nepal, rattan and other NTFPs are mandatory to incorporate in the operational plan. The operational plan incorporates through inventory of resources, systematic harvesting, value addition and enterprise development support to contribute in the green economy.

The Government of Nepal has imposed different levels of restrictions in the collection, trade, and export of some of the highly traded medicinal plants to safeguard them in the wild, and to promote cultivation practices. The CAMP workshop (Tandon et al. 2001) evaluated 51 commercial MAPs and NTFPs for their status in the wild. In 2000, Nepal established the high-level Herbs and NTFP Coordination Committee (HNCC), chaired by the Minister of Forests and Soil Conservation, to formulate and implement MAP/NTFP-related policies and to streamline the NTFP sector in the country. The Herbs and NTFP Development Policy 2004 is a milestone in the country‘s strategy to conserve and sustainably manage the MAPs and NTFP sectors. It includes six policy objectives, five policy groups, and 28 development strategies. In general, the policy identifies national challenges, opportunities, and priorities, and provides an outline for moving forward. The HNCC has prioritized 30 species of medicinal plants/NTFPs for conservation, research, development, and management, including 12 species recommended for cultivation. Unfortunately, rattan is yet to be prioritized in the list.

## 8. THE BARRIERS TO GREATER UPTAKE AND USE OF RATTAN

Barriers are multifold in rattan sub-sector. There are practical barriers regarding capacity building, institutional development, taxation, value addition, labor and trading as mentioned in the following.

- **Capacity building:** There is no training institute or government institution for training on rattan furniture manufacturing. The District Cottage and Small Industry Office (DCSIO) is the main government training agency to support the cottage and small industry. DCSIO only provides registration of the enterprise, but do not provide any training or services. However DCSIO never comes for monitoring or follow up how the enterprises are run. Training methods conducted by DCSIO is not scientific since training are not linked with placement, job and income. Once training is provided they are not followed for the job

- **Institutional support:** Enterprise renewable fee has been increased and reached NRs 4000 from NRs 2200. It means District Cottage and Small Industry Office is only concerned for tax, VAT rather than services. There is no insurance provision to bear the loss. There is no strong government policy to support rattan enterprises. During the scarcity of petroleum products, there was no government provision support for gas, petrol, kerosene. In an average, 3-5 LPG gas cylinders are consumed by each processing factories pe rmonth. In the absence of gas, processors use kerosene and diesel. During the Nepal –India conflict on gas, many processing centers were closed due to lack of petroleum products.
- **Illegal supply of rattan:** India has banned in the rattan export. Legally rattan is not allowed to export from India, however Nepalese entrepreneurs import Indian rattan through three major Indian borders (Kakarvita, Susta, Bhairahawa) maintaining many custom practices. There is severe deficit of rattan demanded by the Nepalese entrepreneurs. Therefore, some of the entrepreneurs wish to plant large chunk of plantation in Nepal to fulfill the demand.

- **Skill development of rattan entrepreneurs**: In the past total skilled artisans were imported from India. However, dependency on Indian artisan has been reduced to some extent in recent years. On the other hand, Nepalese workers are not reliable since Nepalese skilled labor have left and gone to the gulf countries. As a result, processing industries could not fulfill the demand of market order in some time due to lack of labor. Sometime there is large number of order received from hotel but rattan industries could not deliver the products in time, even 10-15 days' advance is received. Indian artisans not stay all the time. Generally they go to India 3-4 months in each year. During this period, enterprises are closed or very low production from Nepalese labors. After earth quake in 2015, many labors had gone to their home. Some of them did not come back again in the work.

- **Tax problem:** Rattan suppliers have to pay multiple taxes in the route. Some taxes are legal and some are hidden. Suppliers complain that there is no more hassles in Indian side. Once they get release permission from Indian depot, they can easily come up to Indian border. There is more hassle in Nepal from District Development Committee (DDC), Police check post. They have to pay NRs 5000 to 9000 per check post. They say that product cost equivalent to NRs 3000 should have to pay NRs 9000 in check post. Some of the suppliers say that after 7-10 years of rattan business, they are now planning to switch over their business being tired of taxes hassles in Nepal.

- **Shortage of labor:** Labor shortage, after earth quake is big problem. Sometime new labors are trained and when they are trained they quit their job and open their own processing industry. Another problem is sometime other industries pay more and take the skilled labor. Indian labor is expensive but good quality. However, they mostly take leave. After earth quake, they do not come to Nepal. Factory is about to close due to labor shortage. Before that there were 8-9 labor working in most of the industries, but there were only 2-3 local labors working after earth quake. Bengali people works about 9 months in Nepal when starts winter they cannot adapt and back to Bengal and again come in the summer. Now wage of labor is increased and also cost of raw cane is increased. After earth quake 2015 and Madhesh Andolan in Nepal, most of the rattan processing center face acute shortage of labors. More than 80 percentage processing owners are run by family members because of the shortage of skilled labors. The Madhesh andolan has hit badly the shortage of petroleum products in Kathmandu valley. Bengali artisans gone back to India after few years work and also taken some advances which are loss of the business. Some of the processing enterprises lost up to NRs 300,000 due to laborers.

## 9. THE CURRENT INCENTIVES OR DISINCENTIVES FOR RATTAN USE

Rattan is renewable natural resources. Therefore, it can be used abundantly as raw material to manufacture products. They have many possible application on and uses. Due to rich labor force available in the country and abundant craftsmanship, Nepal could gain comparative advantage, provided that workforce could be trained in improving their skill and if enterprises could be developed for processing and marketing (MDBRPP/DFRS 2010). Rattan processing industry needs small size of investment to start the business, possibly NRs 50,000 to NRs 100,000 and family members could be involved in the processing work. The products manufactured by these enterprises are traditional and easily marketable in the local and national market. There are government affiliated skill development training centers providing training to youths. Council for Technology, Education and Vocational Training (CTEVT) is government skill training center providing training to youths for their employment and enterprise start up. In the past, it was believed that rattan furniture requires large size diameter and small size diameter to manufacture furniture. In fact, Nepalese youths have proved that various types of competitive cane items could be manufactured using Panibet alone.

Therefore, opportunity is available in one hand that cane industries can be sustained even in domestic cane, e.g. the Panibet. Little awareness is to be raised to rural users that rattan is environment- friendly product, and use of rattan products can serve multiple benefits. Despite these benefits, rattan use has pros and cons as well.

Positive changes

At the national level, interest of researchers, NGOs and community people for the conservation of rattan has been increased. As a result series of research works have been undertaken in the sub-sector of rattan. Rattan has drawn attention of some forestry projects, forestry staffs and civil societies for its development and replication in other areas. Rattan was listed in the category of NTFPs and policy in favor of NTFP development, income generation, and handover of ownership in local people developed. To institutionalize the bamboo and rattan, an association of bamboo and rattan processors and suppliers in the national level was formed.

At the community level ownership of local has been increased in conservation, management and utilization rattan for biodiversity and livelihood purpose. Disadvantage people and women's participation has been increased in meeting, general assembly and development works. Conservation education programs was run in the secondary schools, village level meeting and social gatherings in coordination with local schools, development agencies (NGO, INGO, GOs). Democratic exercise was increased within the community people and under the main committee various sub-committees were formed to monitor, control and enhance the efficiency of community investments and progress

Disincentives

Number of households in the CFUGs are large size in most of the cases where size of community forests are very small. There are more than 50 percent of the households are ultra-poor who needs immediate financial incentives which community forest cannot fulfill. As a result, they become frustrated and willingness of participation becomes low in the forest conservation. Government policies such as IEE and EIA are hindering to utilize the forest products such as rattan in the forest and thus cause de-motivates to forest users.

Rattan processing industries are facing shortage of raw material and skill labor to sustain their enterprises. As a result they are less encouraged to run their business. Lack of government commitment to strengthen the sub-sector of bamboo and rattan, and processing centers

## 10. CONCLUSION AND RECOMMENDATION

### Conclusion

Rattan is immerging NTFPs with economically potential in Nepal. They are cheap, eco-friendly and durable. However, potentiality of rattan has not been harnessed of the natural rattan due to poor technical knowledge to users. Preparedness capacity of CFUGs are very weak to cope with the government policy to utilize the potentiality. In spite of the availability of some rattan species available in community forests that can fulfill partial demand if fully utilized, processing industries heavily depend on Indian and other countries rattan to sustain their industries. It is bitter fact that processing industries depending on raw rattan of India and other countries were running with less challenge than depending on domestic rattan. On the other hand, rattan entrepreneurs are depending on traditional knowledge and skill and working with limited traditional tools and techniques. As a result, competitiveness of them is very weak in the national and international market. The skill development training provided by government and non-governmental organizations are manufacturing of handicrafts than marketing development skill. As a result, entrepreneurs are less capacitated to analyse the marketing aspect of rattan products.

In spite of these some constraints, there are various opportunities for developing rattan of Nepal. Community forests of Nepal are great potential for rattan cultivation as agro-ecological climate is suitable for existing rattan species. There are already more than 20 community forests of Kailali and Bardiya district including Dang and Sarlahi potential to harvest. Rattan available CFUGs are capacitated to prepare the IEE/ EIA report and get approval from DFO. Detailed inventory of rattan stock in community forests will provide idea to regulate the yield per annum for commercial purpose.

Rattan industries are feasible to establish with smaller investment as compared to other business. There are many skilled craft makers in the country whose capacity is underutilized. Nepalese labors are required to job- oriented and job security realization should be made on the behalf of rattan industries to retain local labor force. It has been realized that Nepalese rattan products less competitive than Chinese and other countries. Processing technologies of rattan needs to upgrade of Nepalese entrepreneurs with recent technology and tools to enhance the production capacity.

Rattan is potential for source of income both for the country and for all those who are involved in the rattan business. However, rattan business needs to diversify such nursery, plantation, and processing, input support, treatment, processing and sells shop.

Community based management of rattan is very successful example in Nepal. Currently, rattan certification is concerns of international communities. There are 10- 15 community forests of Kailali and Bardiya districts potential for certification. Nepal Government should initiate such opportunities in collaboration with International Network for Bamboo and Rattan (INBAR) and international certification agencies.

Nepal has already nine species of rattan available which in the different climatic and geographical zones. They are large diameter to small diameter rattan. However, production of rattan products in Nepal is confined to Panibet only due to lack of promoting large diameter rattan. There is high opportunity to scale up large diameter rattan in hilly area. to small diameter rattan.

There is lack of clear cut government policy on the development of bamboo and rattan in Nepal. Policy statement is silent on providing production and marketing support to the producers and sellers, and promoting rattan based industries. Hence, The government should formulate appropriate policy for development of indigenous as well as promote other large diameter rattan in suitable climate. INBAR should facilitate to Government of Nepal to promote diversity of bamboo and rattan.

**Recommendation**

**Resource inventory**: Detailed survey of rattan species, quantity, pattern of population variation, distribution, availability of endangered species are need to survey. Due to high variation of geographical and climatic variation in Nepal, some more species are potential to be available. Stocking of rattan is urgently need to be estimated for the yield regulation in the community forest

**In-situ and ex-situ conservation**: Medium and large diameter rattan such as *C.acanthospathus,P.himalyansis, C.leptospadix* and *C.inermis* are found in Nepal but they are critically threat due to overharvesting. They should be cultivated in the similar habitat. On the other hand, *C.tenuis*, which is endemic to low land of Nepal, should be conserved in community forest, private land and government forest.

**Post harvesting technology**: Harvesting techniques of rattan is still based on traditional practice which does not pay attention of regeneration, optimum harvesting and sustainability of resources. Therefore, improved harvesting techniques should be introduced in all the community forest to enhance the capacity of local people for optimum benefit. Post harvesting techniques such as grading, soaking, curing, drying, storage and bundling techniques are need to train to growers and entrepreneurs to enhance the quality of rattan.

**Skill development training**: Skill development training should be provided to youths and crafts man quality production of rattan furniture. It will help to enhance competitiveness of rattan entrepreneurs in domestic and international market. Government institutions such as Council of Technical Educational and Vocational Training (CTEVT) and Domestic Cottage and Small Industries Offices (DCSIO) should take lead to train unemployed youths.

**Involvement of private sectors**: Private sector, such local companies, NGOs, INGO etc should be encouraged to invest in large scale rattan plantation and craft and furniture making. Co-ordination among these bodies and with the producers, collectors, craftsmen and intermediaries involved in collection processing, and making of rattan products should be enhanced.

**Support to CFUGs for FOP preparation**: Currently, CFUGs having rattan do not have IEE and EIA incorporated in their FOP due to lack of technical knowledge and lack of financial capacity to them. On spot training and technical support will boost the capacity of CFUG to revise their FOP according to IEE and EIA perspective, and make able to regulate their rattan.

**Linkage development between producers and processors:** Developing linkage between CFUGs and processors would develop trust between each other to supply and demand of Nepalese rattan. Value chain development is required to promote for internal market.

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