

## Value Chain Analysis of Rattan in Nepal

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### **Abstract**

*This study highlights the existing situations of production, value addition, marketing and uses of rattan cane in Nepal. Rattan enterprises exist as a small and medium enterprise (SME) within and outside the community forest user groups. The study was designed based on the exploratory research and was carried out in Kailali and Bardiya districts. The main objective was to assess the constraints and opportunities of rattan cane enterprise as well as design business solutions. Systematic random sampling method was followed to take the sampling of CFUGs, households and small and medium enterprises. Primary data was collected through focus group discussions, key informants interview, direct observations, open-ended questionnaires, and inventory of growing stock. Similarly, secondary data was collected from progress reports, Forest Operational Plans, audit reports and records of community forest user groups and Division Forest Offices. Sampling design was ascertained representing sampling units of rattan managed Community Forest User Groups and processing industries. The questionnaire survey was conducted to executive committee members of 8 Community Forest User Groups, 526 households and 12 rattan processing industries/ enterprises. Direct observation and interaction with CFUG and entrepreneurs were another major source of information. The quantitative data was analyzed using SPSS 20 and Microsoft Excel software tools. The identified major constraints concerning the selected*

*value chains were: absence of detailed resource inventory in the approved Forest Operational Plans; inadequate knowledge about resource management, poor capacity to incorporate environmental policy concerns, weak business competitiveness, insufficient information about market and poor marketing knowledge. The study also identified a number of opportunities both in the community as well as enterprise perspective. For example, resource potential and monetary benefits to the community people; contribution in community development, involvement of service providers in forest resource management; employment generation and leveraging ecosystem services. The findings suggested technical and business solutions for the effective value chain of rattan cane.*

**Key words:** rattan processing enterprises, actors, value chain, marketing, competitiveness, small and medium enterprise

## **Introduction**

The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producers, services, delivery to final consumers and final disposal after use (Kaplinsky & Morris, 2001). Value chain is the process of analyzing the entire process (from production to end use) of goods and services such as production of raw material, inputs in raw material, resources (money, man) and value addition. The value chain analysis (VCA) assess the profitability, power and institutional environment of key actors (Wong, 2020). Most of the forest enterprises in developing countries are small and medium enterprises (SMEs) (Elson, 2009), rattan cane has been identified as one of the economic potential Non-Timber Forest Products (NTFPs) (Siebert, 2002; Paudel & Chowdhary, 2005). Nine species of two genera of rattan are recorded in Nepal (Chowdhary & Paudel, 2008; Paudel & Chowdhary, 2005). Among them, *Calamustenuis Roxbis* an endemic and widely distributed species throughout the lowland areas of the country, and mostly protected in community forests (Chowdhary & Paudel, 2008). Out of the 57 rattan SMEs recorded in Nepal, about 77 percent are operated using raw rattan cane of Indian and other countries, and they are located in urban and semi-urban areas; rest of 23 percent SMEs rely on domestic rattan (Chowdhary, 2017). Community managed *Calamustenuis* in community forests of Kailali and Bardiya are the source of raw material for them. There are 20 CFUGs in these districts managing natural rattan in their community forests. They provide good prospects for enhancing the livelihood and income of local communities. The main benefits come from the selling of raw rattan, rattan seed and seedling. The annual production of canes is 6 to 8 ton (dry weight) per ha (Paudel & Chowdhary, 2005). In order to promoting well-being of forest proximate people in the forest conservation, regulation and enforcement should be minimal providing economic incentives in the low-intensity and non-deleterious manner that provide conservation and livelihood benefits Herbij *et al* (2018). Community based rattan resource management approaches can be cost effective and reliable. It has been proven that trade oriented management of sustainable

rattan forests can provide alternative income for rural communities (Campbell & Knowles, 2011).

Rattan-based enterprises in Nepal are involved mainly in manufacture of furniture and other household items. The industry accounts for over Rs.17 million and has substantial market potential in urban areas of Nepal (Sharma, 2017). Rattan processing industries consumes Panibet (*Calamus tenuis*). Panibet is mainly commercially available in Nepal. Major rattan products are indoor handicrafts such as chair, table, sofa set, hanger, stool, baskets, cradle and decorative items.

This paper identifies major actors and their functions within the value chain, adoption of technology, regulatory environment, design commercially viable business solution for efficient and effective value chain of domestic rattan cane. However, this paper does not cover rattan processing enterprise fully dependent on Indian and other countries imported rattan cane.

### **Material and Method**

The study was carried out in the CFUGs and rattan SMEs of Kailali and Bardiya districts. This study has been designed based on the exploratory research. The research explored research framework includes combination of socio-economic and resource inventory. For this, simple random sampling method was followed to take the sampling of CFUGs, households and respondents. Sampling was determined from the total availability of rattan in community forests. Sampling design was ascertained based on certain criterions such as CFUGs leading to manage, rattan having in common land but managed by group of people, individuals conserving rattan. By number of forest, out of 20 community forests having rattan available, 8 community forests were sampled.

The research was based on the study conducted in CFUG of Kailali and Bardiya districts which are located in the far and mid-west Terai of Nepal, and survey of rattan SMEs were carried out in major cities and potential market centers. The questionnaire survey was conducted to 538 respondents, out of them 526 were households and 12 rattan SMEs. Direct observation and interaction with CFUG and entrepreneurs were another major source of information. Sampling size were selected using Yamane formula (for finite population) the confidence level for this purpose is 95% at  $p = 0.05$ . The quantitative data was analyzed using SPSS 20 and Microsoft Excel analysis software tools. Qualitative data was analyzed using descriptive method and narratives were presented in relevant to contents.

### **Result and Discussion**

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. 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, 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(Chowdhary & Paudel, 2008). Out of the nine rattan species recorded in Nepal, *Calamus tenuis* is mainly commercially available in Nepal. Nepalese rattan has been considered of good quality due to standard length, natural color and mature.

### **Value chain mapping**

Total production of rattan from community forests of Kailali and Bardiya is about 1300 to 1600 metric ton. Hardly 390 to 480 metric ton was consumed in Nepal. However, in recent years 10 to 15 percent only harvested from the community forests. It indicates that 85 to 90 percent rattan was not harvested due to Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA), expiry of Forest Operational Plan (FOP) and administrative hurdles. Sati Karnali Community Forest of Kailali (SKCFUG) and Shiva, Sarswoti, Lathahawa, Khata, Durga, Lalai, Ganesh, Sanoshree, Ayodhyaphanta, Ganeshpur Sishahaniya, Bhaluphanta, Shanti, Neula, Badalpur including other six community forests of Bardiya district are potential for rattan community forests. However, availability of rattan varies in all the community forests. There were about 34 rattan processing enterprises in Bardiya and Kailali districts in 2010 and remained functional half of them by 2017. Total annual demand of raw rattan was about 1000 MT of the local rattan enterprise, whereas supply was about 486(30%). Remaining 70 percent demand was met by Indian and privately produced rattan. Out of the total production, Sati Karnali Community Forest contributed about 50 percent alone. Interestingly, Nepali rattan has been exported to India through Indian contractors from Kailali and Bardiya district. After mixing with Indian rattan, some percent are again come back to Nepal including Indian rattan. The consumption of rattan goods was highest in markets of neighboring district than in local market. Surkhet, Ghorahi, Tulsipur, Tikapur, Dhangadhi, Kohalpur, Atariya, Nepalganj, Mahendranagar and Dadeldhura are major market center of rattan products. Figure 1 describes marketing channel Community Forest User Groups and various actors.

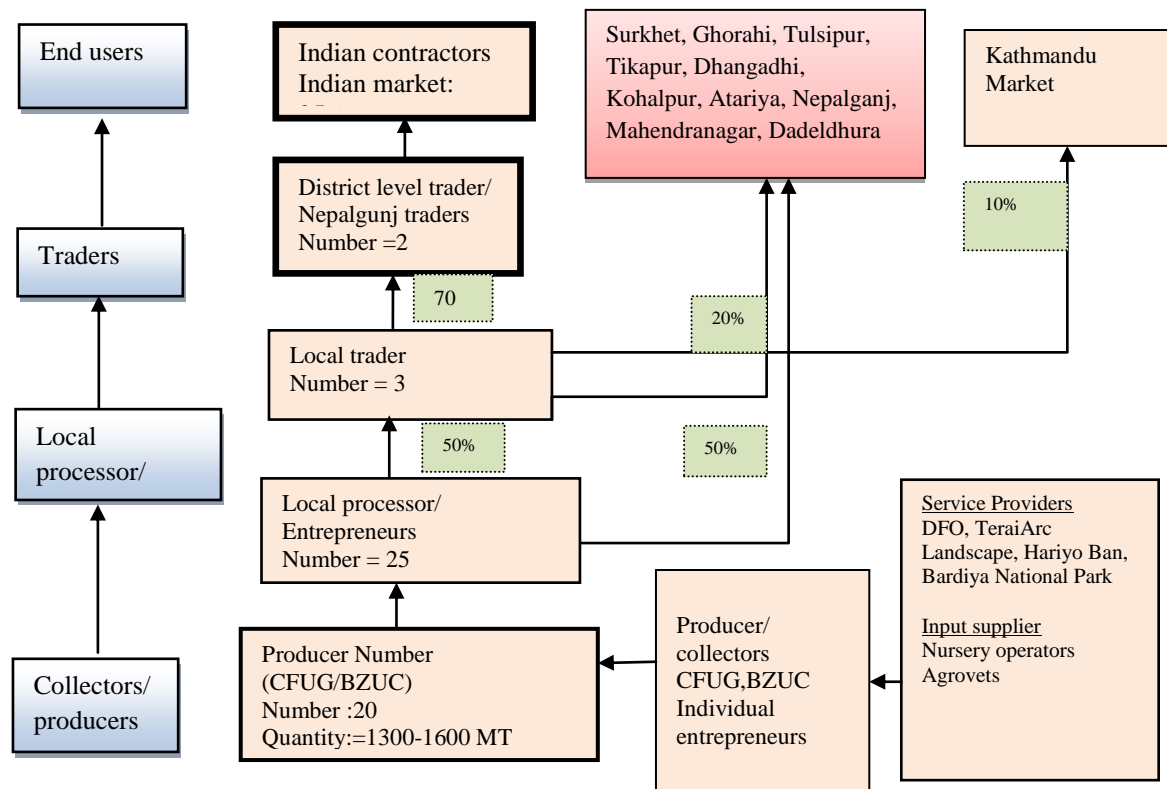


Figure 1: Marketing channel of Community Managed Rattan

### Opportunities and constraints

VCA is a way of understanding of how activities collectively impact the business unit. It provides perspective on how all the activities contribute to the process of adding value to a product or process. It emphasizes the importance of coordinating the linkages and interrelationship among activities, and finally contributes to the strategy learning for enterprise development” (Ensign, 2001). There is a growing consensus that agro enterprise development is a robust process that offers many small families where there are a number of challenges that must be met, and it requires building the skills base and social capital of farmers to enable them to gain a better understanding of markets and how to respond to dynamic market needs(Lundy *et al* (2007). Kailali and Bardiya districts are potential for rattan enterprises since more community forests are waiting for managing rattan in their community forests. On the other hand, rattan enterprises are strongly influenced by the activities governed by the CFUGs. Enterprise friendly policies boost up of rattan and other forest based enterprise, otherwise enterprise are not encouraged.

### Technology and product development

Community Forest Users are involved to harvest the rattan in the forest. But rattan is harvested using traditional technology (Paudel & Chowdhary, 2005; Siebert, 2002), which is time taking and labour intensive practices. Rattan product is also processed with the traditional technology using less hygienic working conditions(Chowdhary C. L., 2017).

However, processing tools used in the rattan processing enterprises are based on modern technology and accepted widely. According to Asha (2017) (in personal communication for product development of rattan) Micro-Enterprise Development Program (MEDEP) in association with District Cottage and Small Industry Office (DCSIO) trained more than 100 local people on rattan furniture and handicraft. Entrepreneurs also received some supports by the project during the enterprise start up time. Managed harvesting of wild rattan and rattan cultivation will likely require significant long-term financial assistance, as well as technical and marketing support (Siebert, 2002). Chowdhary and Paudel (2008) recommended treatment of rattan to improve the quality and follow the grading rules and practice it. There is therefore, an urgent need to standardize grading rules given the economic and ecological importance of rattan. In the absence of standardized grading rules, the rattan market has been severely constrained (Bhat, 2000). Thus adaptive technology is much effective in the context of rural environment.

### **Market Access**

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, sofa. hanger, tools, book case and cradles are highly consumed by local users. There are eleven major cities in the Mid and Far west of Nepal namely Nepalganj, Kohalpur, Ghorahi, Tulsipur, Surkhet, Ghorahi, Tulsipur, Dhangadhi, Atariya, Mahendranagar and Dadeldhura that are potential market of domestic rattan and finished products. Rattan products are also sold in the Kathmandu, Pokhara and Narayangadh. Nepalese raw rattan is considered of high quality due to maturity, commercial length, bright color and good size. 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.

Although Panibet is mainly commercially available in Nepal, due to administrative cumbersome in the transportation route and multiple taxes, it is not purchased now in Kathmandu and major cities. Mainly Indian contractors purchase Nepali bet from the community forests. Nepali bet is long and considered good quality. Nepali bet- roughly 1300 to 1600 is produced per year from community forests. Hardly, 390-486 metric tons consumed in Nepal, In recent years potentiality of harvesting of 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.

In 2016, there were 57 processing industries running in Nepal. Out of them, 12 processing industries were located in Kailali and Bardiya district.

The demand for bamboo and rattan products is increasing in Nepal, but market is still in a disorganized state and inefficient. Lack of transportation is one of the main reasons of such condition. Other reason for inefficient marketing is lack of competition among the traders, and lack of marketing information(MDBRPP/DFRS, 2010).

### Input supply

Technical input was urgent to rattan based community forests of Kailali and Bardiya districts. In the beginning community people were even unknown about identification, uses, nursery practices, harvesting method and post harvesting techniques (such as seasoning, storing, grading) including importance on ecosystem and biodiversity.

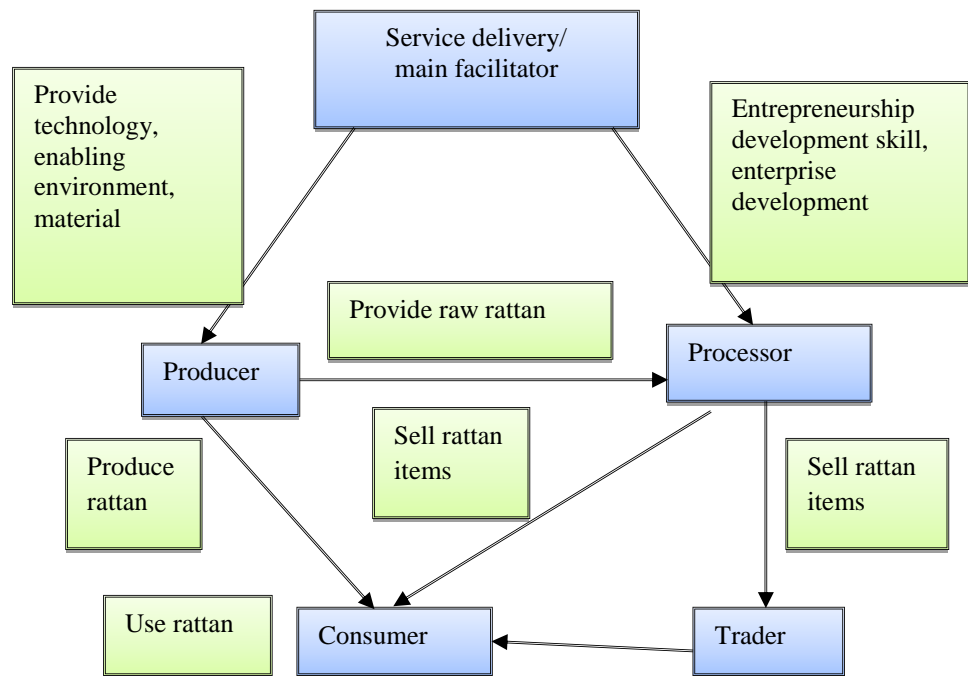


Fig 2: Input supply channel (source: Dhakal 2016, Aadapted in 2020)

The main inputs in rattan production and processing were raw rattan, LP Gas, nails, kerosene and polish (Fig 2). Different organizations and agencies working for rattan had provided seedlings for cultivation of rattan to the community forest user group. TAL projects of WWF and Micro-Enterprise Development Program (MEDEP) had supported to poor households of the CFUGs for skill development training. After identification of rattan species, Rattan Management Plan (RMP) was prepared incorporating improved management methods eg. Detail growing stock, block division, harvesting techniques, post harvesting techniques. Training manual in the local language was distributed to CFUGs for self-learning and replication of knowledge. On spot feedback was provided to CFUGs on implementation of RMP, and leanings to improve the situation. Rattan nurseries was supported for production of rattan seedling, enrichment plantation and distribution purposes. Later on entrepreneurship development training on rattan furniture was provided by DFO, TAL, Hariyo Ban, WWF.

Out of the 20 community forests having rattan in their forests, only three community forests have done detailed inventory, seven have partial inventory of growing stocks that were incorporated into the FOP, rest 10 CFs were without growing stock of rattan. Harvesting

practices of rattan is still destructive in more than 50 percent community forests. Premature harvesting, clear cut harvesting and lack of management of derivatives that damage the regeneration are some of the draw backs.

### **Financial Access**

Rattan SMEs were open with the technical and material support from Community forest user groups and Khata Biodiversity Corridor. Sati Karnali Community Forest User Group had provided skill development training to their potential entrepreneurs from their own financial sources, Sarswoti and Shiva CFUG including other CFUGs also provided such trainings to youths for the same purpose. Enterprise start up financial support was provided by Sati Karnali Community Forest User Group (SKCFUG) by their users. SKCFUG supported NRs 10,000 to each selected 30 households for enterprise development support without interest. Support was provided to rattan cane furniture making training to 17 youths to start rattan cane furniture enterprises in the communities. SKCFUG provided raw cane in the subsidized rate to start enterprises and household uses. Interested users got 10 Kg rattan stems at the rate of NRs 30 per kg. Some CFUGs in Bardiya district also supported to their entrepreneurs raw rattan regularly in the subsidized price. SKCFUG supported to their users to purchase bank share and financial support to disabled persons. Dhakal(2016) argues that despite the regulatory decision, from 2007 onwards when harvesting of rattan was restricted, supply of raw material was disrupted due to expiry of operational plan as well as lack of IEE.

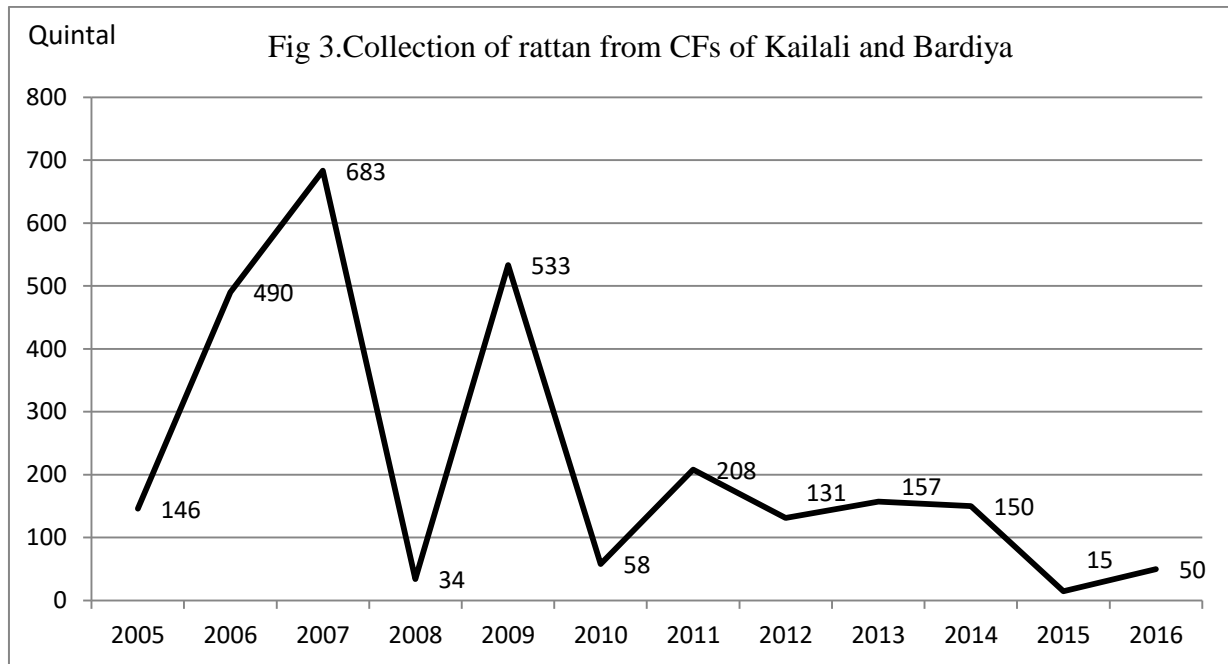
### **Regulatory policy**

Major policies influencing rattan including other NTFPs are Forest Act 1993, Forest Regulation 1995, The Forestry Sector Policy (2000), its amendment 2015, and Environmental Protection Act 2007. The government has fixed royalty rates for NTFP through the Forest Regulation 1995. Forestry Sector Policy 2000 has emphasized the promotion and commercialization of NTFPs, including their export to foreign countries after value addition, encourages local communities to establish forest processing enterprises and involvement of private sectors. There is no separate policy, guideline or directive to conserve and utilize bamboo and rattan in Nepal. International Fund for Agricultural Research (IFAR)(1991) also supports this statement that non-timber forest products, even the more important ones such as bamboo and rattan, have been largely ignored by governments. As such, there are relatively few policies in place in most countries which are specifically aimed at NTFPs. In favor of this, Dhungana and Bhattarai(2008) adds that the Industrial Policy 1993, which has been updated recently, guides the overall industrial sector, including forest based industries. The policy lists the forest based industries comprising carpentry, wooden handicraft, products made out of bamboo, rattan and natural fibres, handmade paper and Sabai grass as traditional cottage industries under Annex 1 and are exempt from tariffs, sales tax and income taxes. Government of Nepal has fixed royalty rates for NTFPs through the Forest Regulation 1995. However, CFUGs were not aware of their selling rights, irrespective of the government royalty as mentioned in the Forest Bill of 1990(Shrestha, 1998).Despite the government has



developed Herbs and NTFPs Development Policy (2004) with the long term goal to substantially contribute to Nepalese economy that also mentions simplification of tax system for privately grown NTFPs, it has been silent on CF Paudel *et al*(2010). There is also contradiction in controlling system on forest products between 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. Most of the CFUG members experienced negative effect of the Environmental Protection Act 2007 in the community level. It has delayed the process of handing over forest to communities. Most of the CFUGs potential to harvest rattan, are stuck due to lack of IEE and EIA report. Except the policies, there are various hurdles to transportation in-route. For example, 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.

The annual harvesting of rattan in CF of Bardiya and Kailali was cut over 90 per cent to harmonize minimum threshold of the policy. Some of the CFUGs have stopped to harvest the rattan in their CF even they are getting mature. According to Sharma (2016) (in personal communication on bottleneck of rattan business in Bardiya) more than 15 CFUGs have neither renewed their forest operational plan (FOP) nor they have IEE. However, Ganesh, Shiva, Durga, Sanoshree, Ayodhyaphanta, Sarswoti, Lalai, Ganeshpur Sishahaniya, Tharu CFUGs have harvested less than 5000 Kgs in 2015 and 2016 rattan from their CFs based on their valid FOPs. District Forest Office approved the request of harvesting quantities. Roughly 5-7 percent rattan was only harvested from their CFs. As a result local entrepreneurs did not get adequate raw material to sustain their enterprises. Entrepreneurs of Rajapur area revealed that they were getting 25 to 50 percent raw rattan supply from community forests. Six craftsmen from six households of Sonhaphata community forest were jointly collecting the rattan and producing the rattan goods in the community building. Another rattan entrepreneur KC (2017) added (in personal communication on constraint and opportunities in rattan enterprises in Bardiya) that due to lack of raw material and unnecessary administrative burdens after imposing of IEE, three rattan enterprises have been closed their business for ever. The Figure 3 presents the quantities of rattan harvested in CFs of Kailali and Bardiya district from 2005 to 2016.



### Organizational management

More than 60 percent OPs have already been expired. They have neither renewed their OP nor prepared IEE report. Even those CFUGs had valid operational plan, they were not able to prepare the IEE due to lack of technical expertise and financial resources. Dhakal(2016) argues that Durga Community Forest, Shiva Community Forest, Saraswati Community Forest including more CFUGs routinely harvested nominal quantities of rattan from their community forest despite validity of forest operational plan were expired.

From the entrepreneurship perspective, member of Sati Karnali, Durga, Shiva, Sarswoti, Badalpur, Sonhaphanta CFUGs had already started their rattan processing enterprise, but it was challenging to continue them when rattan harvesting was restricted. For example, Shiva community forest lies in the Khata Biodiversity Corridor had neither revised their OP nor harvested rattan from last nine years back. Members of this community forest were positive towards the rattan in community forest.

In spite of this restriction, rattans was harvested from community forests like Durga, Sonhaphata, Shiva and Sarswoti CFUG at mutual understanding of members and authority of community forest for commercial need of members of CFUG. Entrepreneurs of Rajapur area revealed that they were getting 25 to 50 percent raw rattan supply from community forests in emergency period to sustain the enterprises. Beside this, members of CFUG could collect rattan culms from CF on occasions like ceremonies, house construction and maintenance etc.

Six craftsmen from six households of Sonhaphata community forest were jointly collecting the rattan and producing the rattan goods in the community building. The community forest user groups had helped them to manufacture and sell the rattan produced by them. As a result, they have to pay about 20 percent amount from sale of each item to the community forest fund, which was used for welfare of community forest user group.

### **Stakeholders**

There were five stakeholders involved in the value chain of rattan in Kailali and Bardiya District. They were input supplier /principal facilitator, producers/ harvesters, processor, trader and consumer (Dhakal, 2016). Main facilitators facilitated the producers by providing the nursery and plantation support, estimation of growing stock, revision of FOP, skill development training to rattan entrepreneurs. Community Forest User Groups were the producers of rattans. They were involved in the protection and management of rattan. Major input suppliers were DFOs, Hariyo Ban/ WWF and TAL, NGOs. Rattan processors were the small and medium enterprise (SME) owners, processing various rattan products. They were also village traders/ entrepreneurs who have knowledge of local sources of rattan. They maintained a close relationship with the collectors/producers in their respective working areas. They bought those raw rattans directly from community forests. Traders supplied those rattan goods items to urban areas and to markets of different districts. They bought the goods from the processors and then transport and trade to neighboring areas, districts and regions. Rattan finished product were also sold to Kathmandu, Narayangadh and Butwal. Major consumers were local people and neighboring market centers including major cities. Some of the processors directly sold their products to the neighboring and major market center. Out of the 20 CFUGs potential, 10 CFUGs were actively involved in producing and harvesting of rattan, 25 local, one large entrepreneur, 3 local and 2 district level traders were involved in rattan value chain. Indian contractor have very strong network with traders of Nepalgunj, Sunwal and Bhairahawa. They mostly pay higher price of Nepalese rattan, bring to India.

### **Cost of production and value addition**

Cost of production of raw rattan was 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 was also fixed by CFUG itself. The stocked rattan was sold at the rate of NRs 55 per kg through tender process (Dhakal, 2016). The wholesale price at Kathmandu was NRs 60 to 65.

In case of finished rattan products imported from India, cost of production and selling price varies about 50 percent due to distant from the market centers, availability of raw material, storage capacity and market condition.

The marketing margin is the cost of difference between selling cost and production cost. Average marketing margin of rattan products ranges between 37 to 64 percent. However,

normal margin was about 50 percent. Producers share the benefits ranging from 18 to 41 percent whereas wholesalers share benefits within 5- 10 percent of the consumer price, and the retailer have 8- 20 percent benefits.

## **Conclusion**

The value chain model configures activities to create value in a product or services. Rattan business is small and medium enterprises in Nepal. Out of the 57 rattan processing SMEs in Nepal, 23 percent rely on domestic rattan, and about 5-10 percent supply of total demand of Nepalese SMEs are met by domestic rattan. Community managed *Calamustenuis Roxb* in community forest user groups of Kailali and Bardiya are the source of raw material for them. There are 20 community forest user groups in Kailali and Bardiya districts managing natural rattan in their community forests. In order to promoting well-being of forest proximate people in the forest conservation, regulation and enforcement should be minimal providing economic incentives in the low-intensity and non-deleterious manner that provide conservation and livelihood benefits. Rattan-based enterprises in Nepal are involved mainly in manufacture of furniture and other household items. Rattan processing industries consumes Panibet. Panibet is mainly commercially available in Nepal. Major rattan products are indoor handicrafts such as chair, table, sofa set, hanger, tool, baskets and decorative items.

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