

Investment and benefits associated with community based forest enterprises in Nepal

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Community forests in Nepal are operating various types of forest-based enterprises. These enterprises are generating considerable amount of income and employment at the local level contributing to the local and national economy. Comprehensive assessment of these enterprises is needed to improve their condition in the future. There is lack of assessment on the investment and benefits associated with these enterprises. We collected the data from 195 community-based enterprises in 23 districts of Nepal representing all geographic and development regions. For the analysis purpose, we categorized the enterprises into four categories *viz.* non-timber forest products (NTFPs), wood, ecotourism and agriculture enterprises. We analysed the investment, income, households benefitted and employment generation from these enterprises and compared with each other. Mean investment in ecotourism (US\$ 22805.09) and wood (US\$ 11252.42) based enterprises was found higher than the mean investment in NTFPs (US\$ 2628.03) and agriculture (US\$ 3383.63) based enterprises. Mean annual income from the enterprises was found US\$ 1982.56 and was significantly different between the types of enterprises ($P < 0.05$). On an average 115 households were benefitted per enterprise. Employment generation from wood based (2527 man-days) enterprises was found the highest followed by ecotourism (1490 man-days) enterprises. The mean employment generation from NTFP (1093 man-days) and agriculture-based enterprises (978 man-days) was found significantly lower ($P < 0.05$) than timber and ecotourism-based enterprises. Examination of community-based forest enterprises contribution in local economy and household economy is recommended for future researchers.

Key words: Community forestry, ecotourism, employment, income

Forestry sector has potential to contribute to the growth of local and national economy (Ludvig *et al.*, 2016). Nepal is rich in forest resources. Based on the latest inventory, 44.74% area is occupied by the forest and other wooded land in Nepal (DFRS, 2015). High biodiversity, significant forest coverage, forest dependency, and access to larger transnational markets (such as China and India) are the opportunities of forestry sector of Nepal to contribute to the economic growth in both local and national levels (Rai *et al.*, 2014). Forest sector in Nepal has less contribution to national economy in comparison to its potentiality as forestry sector is not harnessing its economic potential (Banjade, 2012). Frequently changing policy in utilization

of forest products (e.g. ban on tree felling, ban on collection of NTFPs) has discouraged the investors to invest in forestry related enterprises (Subedi *et al.*, 2014).

Community forestry in Nepal has been initially started for meeting the people's basic needs and checking the rate of deforestation (Barlett, 1992; Malla, 2000; Ojha *et al.*, 2009). Now community forestry is one of the dominant forest regimes in Nepal. Around 23% of the forest area has been handed over as community forest. It has been recognized as successful programme for forest resource management especially in the mid-hills of Nepal (Paudel, 2014; Paudel, 2015). The role of community forestry has been gradually widening.

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Issues ranging from governance to livelihood and climate change to enterprise development have to be addressed through community forestry. With respect to climate change, community forests are implementing climate change adaptation activities (Acharya and Paudel, 2016) and contributing to carbon sequestration (Tripathi *et al.*, 2017) for mitigating climate change. Community forestry users in community forests have already been involved in enterprise development in a small scale. Enterprise development has been raised as one of the issues of discussion in the Fifth Community Forestry National Workshop held in 2008. Various legislation and policies also emphasize to the development of forest-based enterprises. Enterprise development in the community forest is highlighted in various forums but it has not been effective at the community level.

Forest products including non-timber forest products (NTFPs) can contribute to the local livelihood and national economies (Shackleton and Pandey, 2013). This contribution can be increased through the enterprise development and value addition. NTFPs farms have to pay certain level of royalty to the government while the other agricultural products have no royalty which the scholars recognized needs to be removed for developing the forest-based enterprises (Subedi *et al.*, 2004).

Primarily local people are benefitted from the Community Based Forest Enterprises (CBFEs) in terms of income and employment (Nurse *et al.*, 2004). Veneer, incense sticks, leaf plates, bio-briquette, saw mill, Nepali papers, *Girardinia diversifolia* (Himalayan nettle-allo), fabric products, *Aegle marmelos* (bel) juice, bamboo crafts and furniture are the major forest-based products produced in Nepal from the forest-based enterprises (Neupane, 2014). Study conducted by the Multi Stakeholder Forestry Programme (MSFP) estimated that around 41,062 forest-based enterprises including timber, NTFPs, ecosystem services (ecotourism) and forest bioenergy are being operated in Nepal (Subedi *et al.*, 2014).

Enterprise development has significant potentiality in income generation and livelihood improvement but this opportunity has been missed (Nurse *et al.*, 2004) in Nepal. Forest based enterprises have role in securing food security, improving livelihood and poverty alleviation

(Neupane, 2014). In Nepal forest-based enterprises are operated especially in two ways, private enterprises and the community enterprises. CBFEs are the enterprises operated by either a single community forest or a group of community forests. In fact, it is an organized activity for strengthening economic conditions, strengthening stakeholder's networks and creating employment opportunities at the local level through value addition (Acharya, 2005). Although community forests have various opportunities in terms of raw materials and resources, there are various challenges for the development of the CBFEs. For the development of the CBFEs Pokharel *et al.* (2006) identified that the low capacity in using improved technologies and inadequate access to market are the major problems. Forest product-based enterprises especially NTFP based enterprises established by the communities are not competitive in this age of globalization as they cannot compete with the products of the market (Banjade and Paudel, 2008). Inherent uncertainty and risk has been remained as the limiting factor for increasing investment in the forest based enterprises in Nepal (Subedi *et al.*, 2014).

To remove the obstacles and grab the opportunities of forest enterprise development, Nepal has formulated and implemented various policies and legislative documents. Community forestry development guideline, 2014 has the explicit provisions on forest-based enterprise development in the community forestry (DoF, 2014). Forest Policy, 2015 and Forest Sector Strategy (2016-2025) emphasize the forest product-based enterprise development (GoN, 2015; GoN, 2016). Nepal's forestry sector policy has the provision of promoting the forest-based enterprises. Gaps remain in translating these provisions into operation to achieve the desired targets. Few studies have been conducted regarding the investments and benefits of the community-based forest enterprises. Research and studies on different aspects of these enterprises are the pre-requisite for the development of these enterprises. Due to few studies of the CBFEs we have no idea on how to make them competitive in the age of globalization by removing weaknesses and grabbing opportunities. Therefore, this study was conducted with the objective of assessing the investment and benefits including income, households benefitted and employment generation from the community based forest enterprises in Nepal.

Materials and methods

Study area

The study was conducted in 195 community-based enterprises in 23 districts (Table 1 and Fig. 1) of Nepal. A consultation meeting was done with the officials of the Department of Forests and Community Forest Federations representatives for selection of the districts to be studied. Identified 23 districts cover all the physiographic and development region of Nepal.

Table 1: Studied districts in Terai, Middle Mountain and Himal

Physiographic region	District
Terai	Jhapa, Morang, Sunsari, Rauthat, Rupendehi, Banke
Middle Mountain	Dhankuta, Bhojpur, Khotang, Makawanpur, Kaverepalanchowk, Kathmandu, Bhaktapur, Palpa, Syangja, Gulmi, Arghakhanchi, Pyuthan, Salyan, Surkhet, Dadeldhura
Himal	Taplejung, Sankhuwasabha

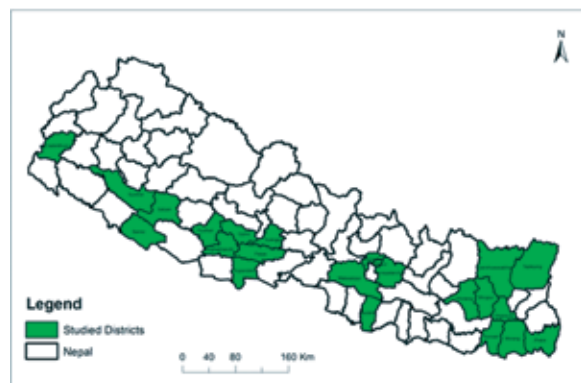


Fig. 1: Map showing study districts

Data collection

A data collection format was developed at the Community Forest Division of the Department of Forests (DoF). Discussion was held with the officials of the then DoF and Ministry of Forests and Soil Conservation (MFSC) prior to conducting the research. Data collection format was designed to collect the data on investment

(installation and operation costs) in the enterprises, annual income, households benefitted, and the employment generation from the enterprises. Pre-test of the format was done in two enterprises of the Kavre district and found satisfactory. Enterprises were categorized into four types namely (1) Wood based enterprises that include timber, veneer, and furniture, (2) NTFP based enterprises that include storage, processing and value addition (3) Ecotourism based enterprises that include picnic spots, recreation site, trekking and hiking and (4) Agriculture based enterprises that include bee hiving, fruit plantation, and goat rearing. Data were collected from 195 enterprises comprising 109 NTFP-based enterprises, 35 wood-based enterprises, 15 eco-tourism based and 36 agriculture-based enterprises on the year 2016 and 2017.

Data analysis

The data collected formats were reviewed and then data were fed into Ms-Excel and Statistical Package for Social Sciences (SPSS) was used for analysis. Investment of each type of enterprise was calculated by adding the costs of the installation and operation of that enterprise. Likewise mean annual income, households benefitted and the employment generation were also calculated for each type of enterprise. Analysis of Variance (ANOVA) was conducted to test the significance of mean difference in income, investment, number of benefitted households and employment generation from different types of enterprises. Further, Least Significant Difference (LSD) test was conducted as post-hoc test to identify the significance on mean differences between these enterprises.

Results and discussion

Investment in enterprises

Since the establishment time, a total of US\$ 1,144,177 (1 US\$ = NRs. 100) was found to be invested in the studied enterprises in 23 districts. The mean investment of all the studied enterprises was US\$ 5,868. The mean investment was found higher in ecotourism-based enterprises (US\$ 22,805) followed by timber-based enterprises (US\$ 11,252). The mean investment in NTFP and agriculture-based enterprises were found to be US\$ 2,686 and US\$ 3,384, respectively (Fig. 2).

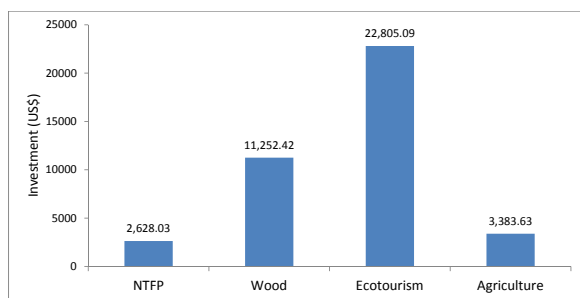


Fig. 2: Mean investment in four types of enterprises

One-way ANOVA showed that mean investment was significantly different ($p < 0.05$) in four types of enterprises. Based on the LSD test, the mean investment of enterprises was significantly different between NTFPs and wood, NTFPs and ecotourism, wood and ecotourism, agriculture and wood, agriculture and ecotourism-based enterprise. There was no significant difference between NTFPs and agriculture-based enterprises (Table 2).

Table 2: Results of LSD test of mean difference in investment (p -value)

	NTFP	Wood	Ecotourism	Agriculture
NTFP		.000*	.000*	.725
Wood	.000*		0.001*	.003*
Ecotourism	.000*	0.001*		0.000*

* significant at 0.05 level

Ecotourism is regarded as a tool to provide economic benefits to the local communities maintaining ecological integrity especially through the low-impact, non- consumptive use of local resources (Stem *et al.*, 2003). Investors are motivated to invest in the tourism sector considering tourism as one of the successful businesses in Nepal. Community forests were used for tourism facilities like picnic spot, bird watching, hiking, etc. Wood based enterprises require the machinery and equipment for their establishment, operation and maintenance, thus investment in these enterprises was higher than that of the NTFPs and agriculture-based enterprises.

Income from enterprises

The studied enterprises had total annual income of US\$ 386,599.21 with US\$ 1982.56 per

enterprise. The mean income of timber-based enterprises was higher (US\$ 6378.57) followed by ecotourism-based enterprise (US\$ 2247.70). The mean income of the NTFP based and agriculture-based enterprises was found to be US\$ 828.94 and US\$ 1091.08 respectively (Fig. 3).

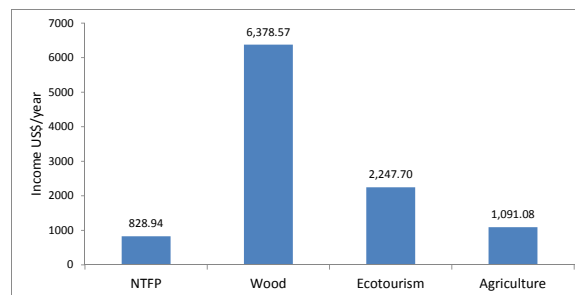


Fig. 3: Mean income from four types of enterprises

One-way ANOVA revealed that the mean income of different types of enterprises was significantly different ($p < 0.05$). LSD test showed that mean income was significantly different between NTFPs and wood, wood and ecotourism and wood and agriculture-based enterprises (Table 3).

Table 3: Results of LSD test to test mean income of enterprises (p -value)

	NTFP	Wood	Ecotourism	Agriculture
NTFP		.000*	.409	.827
Wood	.000*		0.033*	.000*
Ecotourism	0.409	0.33		0.546

* significant at 0.05 level

Based on other studies (e.g. Acharya, 2005; Pokharel *et al.*, 2006 and Pun and Shrestha, 2008), enterprises operated by the community are generating significant income at the community level. Acharya (2005) reported that there was 11% increment in the household level income from CBFE of the Dolakha district. The mean income of the NTFPs based enterprises in this study was significantly lower than other enterprises. Different types of technologies are needed to obtain the desired product from different NTFP species rather than the use of similar technology as in case of wood-based enterprises. In Micro-enterprise Development Program (MEDEP), per-capita income has been increased by 26.6% after involvement in the forest based micro-enterprises

and at the same time per-family income has been increased by 46% (Pun and Shrestha, 2008). In this study, the mean income from the NTFPs based enterprises was found lower than other enterprises. Technology development for NTFPs collection and processing is not adequate (Pokharel *et al.*, 2006).

This study revealed that especially timber is the forest product of comparative advantage in wood-based enterprises and such enterprises operated by the community are significantly contributing to the poverty reduction (Acharya and Acharya, 2007). According to Banjade (2012), the timber has a significant contribution to the national and local economy as compared to other products, although it gets lower priority in policy discourses. NTFPs has dominated in the policy discussion while at the same time researchers suggest that timber has higher potentiality to contribute to the economy. Therefore, emphasis should be given to the timber and wood-based forest products in forest policies and programmes. If we use the timber from community forests in a sustainable way, substantial income can be generated at the community level.

Households (HHs) benefitted from enterprises

The mean number of households benefitted from four types of enterprises was found to be 115. The mean number of HHs benefitted from ecotourism enterprises was higher (335 HHs), followed by the wood-based enterprises (121 HHs). The mean number of HHs benefitted from NTFPs and agriculture-based enterprises were 93 and 84, respectively (Fig. 4).

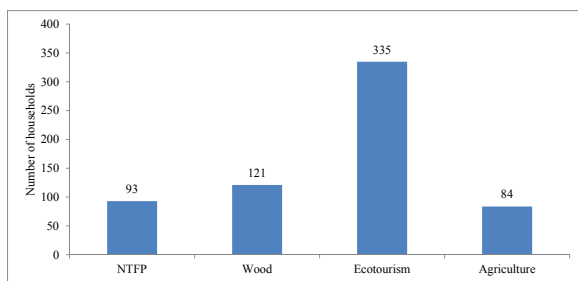


Fig. 4: Mean number of households benefitted from four types of enterprises

One-way ANOVA revealed that the mean number of HHs benefitted from four types of enterprises was significantly different ($p < 0.05$). LSD test

showed that mean number of HHs benefitted from the ecotourism-based enterprise was found significantly different than other enterprises. NTFPs and wood, NTFPs and agriculture, wood and agriculture-based enterprises were similar in mean number of HHs benefitted (Table 4).

Table 4: Results of LSD test to test mean number of households benefitted from enterprises (p-value)

	NTFP	Wood	Ecotourism	Agriculture
NTFP		.439	.000*	.604
Wood	.439		0.008*	.239
Ecotourism	.000*	0.008*		0.001*

*significant at 0.05 level

In urban area, the number of HHs of the community forests is usually higher than the number of HHs of the community forests in rural area. The higher number of households benefitted from the ecotourism enterprise may be mainly due to the fact that the communities in urban area are operating ecotourism-based enterprises. NTFPs and agriculture-based enterprises were operated by a small number of members in the community forest, which resulted in lower number of HHs benefitted from these enterprises.

Employment generation from enterprises

The employment generation from the studied enterprises was found to be 1362 man-days per year per enterprise. The wood-based enterprises generated higher employment (2527) than other enterprises, while the employment generation from agriculture enterprises was found to be the lowest (978). The employment generation from ecotourism and NTFP based enterprises were found 1490 and 1093 man-days, respectively (Fig. 5).

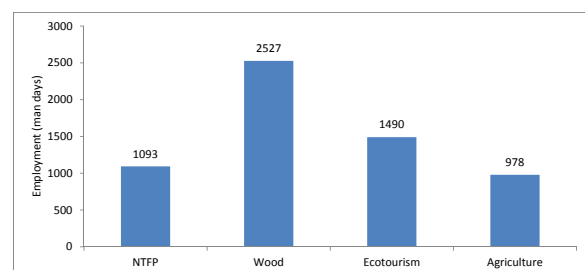


Fig. 5: Mean employment generated from four types of enterprises

One-way ANOVA showed that the mean employment generation from four types of enterprises was found significantly different ($p=0.000$). Further, the LSD test showed that mean employment generation from wood-based enterprise was significantly higher than that of NTFP, ecotourism and agriculture-based enterprises (Table 5).

Table 5: Results of LSD test to test mean employment generation from enterprises (p -value)

	NTFP	Wood	Ecotourism	Agriculture
NTFP		.008*	.600	.829
Wood	.008*		0.223	.019*
Ecotourism	.600	0.223		0.545

This study revealed that four types of enterprises had generated employment at the community level. Thus, it is obvious that operating CBFEs have tremendous scope in generating employment at the local level. The main activities in generating employment in CBFEs were collection of raw materials, fuel wood and value addition/processing (Acharya, 2005). Employment has been generated in two ways from the forest-based enterprises in the rural area such as, working in processing factories and generation of self-employment through collection or production and sale of raw materials (Nurse *et al.*, 2004). Employment generated at the local level can help to raise income of the local people and thereby reducing poverty in a sustainable way. CBFEs are playing vital role in poverty reduction through generation of employment opportunities for the poor people (Pandit *et al.*, 2015). In this research wood-based enterprise generated more income than other types of enterprises. Promoting wood-based enterprises through simplification of the timber extraction process would be helpful in employment generation at the community level which ultimately helps to achieve the goal of poverty reduction. While giving priority to the wood-based enterprise, at the same time emphasis should be given to the establishment and operationalization of enterprises based on the potentiality of availability of the raw materials for operating enterprise. This could be the pathway to achieve prosperity through utilization of forest resources in Nepal.

Conclusion

This study analysed the investment and benefits of the community-based forest enterprises of Nepal. The study revealed that the highest investment was in ecotourism-based enterprises, followed by the wood-based enterprises. The mean annual income of wood-based enterprises was significantly higher than other enterprises. The mean number of households benefitted from ecotourism enterprises was found to be higher. The members from large community forests had operated ecotourism-based enterprises, whereas the members from small community forests had operated NTFP and agriculture-based enterprises. Wood based enterprises had generated more employment than other enterprises. It can be concluded that the wood-based enterprises are comparatively more advantageous and emphasis should be given to the promotion of such enterprises. The raw material availability and market access are the determining factors in enterprise development. The contribution of the CBFEs at the community level is significant through employment opportunities and income generation, though its contribution at the national level is nominal. For the nationwide promotion of the CBFEs, we should be able to show the values of these enterprises; their contribution in national and local economies should be explored. Detail analysis of CBFEs contribution to the local economy and household income is recommended for further research.

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