

Economic potential of forest resources of Nepal

S.S. Pandey^{1*}, B.P. Subedi¹ and H. Dhungana¹

Nepal's forest resources underpin the livelihoods of rural people in important ways. During the country's "planned development" over the past 50 years, the government, donors and policy makers have viewed these resources as a key vehicle for ushering in economic growth and for meeting basic needs. They underscore the potential value of forest resources for achieving conservation and socio-economic objectives. To what extent have economic incentives been generated to effectively harness these resources to meet the said objectives is an open question. To address this question, this paper reviews briefly and broadly the economic potential of the country's forest resources in terms of forest goods and services. Estimates of economic potential of timber and non-timber forest products and environmental services have been assessed. A number of recommendations for realizing the potential for achieving development and poverty reduction objectives is provided.

Key words: Forestry, non-timber forest products, ecosystem services, economic potential, livelihood

The contribution of forestry sector in Nepal's economy is significant. As 39.06% of the country's area is forests, this sector has diverse economic potential. This sector can contribute towards achieving the Millennium Development Goals in Nepal (Kanel, 2004). The country lies within tropical to alpine climates and hosts a wide diversity of plant and animal species. For instance, Nepal has documented about 7000 species of flowering plants, many of which are important both commercially and for sustaining rural livelihoods. Major goods include fuelwood, timber, fodder, wild food, medicines, fibres and non-timber forest products (NTFPs). Similarly, forests provide different ecosystem services such as climate regulation, carbon sequestration, and water regulation. The Millennium Ecosystem Assessment identifies both the 'goods' and 'services' as ecosystem services and categorizes them into provisioning, regulating, supporting, and cultural services. These forest goods and services would add up to a huge contribution to the Nepalese economy, but there is a lack of a systematic accounting. The understanding of the economic potential of forest resources is sketchy and efforts to tap such opportunities are negligible.

Thus, the purpose of this paper is to assess the economic potential of forest resources in Nepal, based on available data and other project level

experience for interventions and income generation. Such assessments can give some direction to the policy makers and development organizations on how to harness forest-based economic opportunities for national development. Further, such assessments may reveal economic potentials of forestry sector that could be tapped fully for boosting up the Nepalese economy and fostering the livelihood of forest dependent communities.

Methodology

Most of the information used in this paper are drawn from secondary sources like existing data, studies, project reports, and office records. However, there are only a few information on the economic aspects of forestry and only limited studies have been done for assessing such opportunities. A judicious use of these existing results of the project interventions have been employed to explore the economic potentials of the forest resources in this paper.

Results and discussion

Current contribution of the forestry sector

The following sections present the main uses of forest products and services and their respective economic contributions in the form of the generation of revenue and employment.

¹ ANSAB, Kathmandu, Nepal.

* Author for correspondance: shivapandey@ansab.org

Timber

Timber and fuelwood are amongst the most important forest products that generate cash earning and are critical to the livelihood of rural people. Although revenue generation remains significant (Table 1), the contribution has declined over the period of 2003-06. This declining trend must be examined to ascertain the level of illegal logging or corruption involved in the trade and transport of timber and fuelwood.

Area) charged against tourist arrivals is erratic. This was primarily due to great fluctuation in tourist arrival during the period of Maoist insurgency but, in the post-conflict context, more stable revenues may be expected.

Moreover, the notion of payment for environmental services (PES)—primarily for such services as biodiversity conservation, watershed protection and

Table 1: Timber and fuelwood trade recorded by the Department of Forest, 2003-06

Institutions	FY 2003/04		FY 2004/05		FY 2005/06	
	Quantity (cft)	Revenue (Rs)	Quantity (cft)	Revenue (Rs)	Quantity (cft)	Revenue (Rs)
District Forest Office	1,981,503	488,213,617	1,227,739	314,119,778	924,843	47,072,160
Community Forests	NA	77,909,234	NA	40,274,330	NA	8,306,309
Total		566,122,851		354,394,108		255,378,469

Source: DOF (2005, 2006, 2007).

Non-timber forest products

Nepal records 161 species of NTFPs harvested for commercial purposes (Subedi, 2006). More than a 100 of these species are high value NTFPs that are traded in national and international markets. The livelihood of the majority of population of Himalayan and High Mountain, especially in Western Nepal, is sustained by NTFP trade (Subedi, 2006). The bulk of the NTFPs, especially medical and aromatic plants (MAPs), are exported to India with the remaining sent to other countries such as the United States and those in Europe. Nepal's NTFP export was estimated at over NRs. 2.5 billion (\$35 million) in a single year 2001/2002 (Subedi, 2006).

The total tax revenue generated from the NTFPs, according to records at the Department of Forests for the years 2003/04, 2004/05 and 2005/06 were Rs. 44,272,692, Rs. 77,840,603 and Rs. 44,213,019, respectively (DoF, 2005; 2006; 2007). There is, however, no system for systematically tracking the income and employment generated from NTFP nationally.

Environmental services

Another source of earning from forest relates to environmental services. As of now, the revenue from the environmental services generated from forest is confined to the fee charged on the tourists visiting the protected areas and to payment for watershed conservation services. The revenue from 14 protected areas (excluding Annapurna Conservation

carbon sequestration from forestry sector—is still evolving globally. In Nepal, small initiatives have taken place. For example, Makwanpur District Development Committee (MDDC) has been allocating 20 percent of the amount that it receives from Nepal Electricity Authority for the location of hydro power plant in Kulekhani of this district. At present, the MDDC receives \$55,000 annually and this is ploughed back to the upland communities for the environmental services of protecting the upland watershed. A greater effort is needed to devise enduring mechanisms that guarantee flow of benefits to those who sustain the valuable ecosystem services at local as well national levels.

Potential for forest based economic development

The previous section presented the existing status of revenue generation from forest products and ecosystem services. These figures do not represent the full economic potential of the forestry sector in Nepal. For instance, in ANSAB experience, the existing programme of community forestry provides important opportunities for rural people to use forest products in a sustainable way to generate employment and income. Establishing community-based enterprises and integrating them into responsible value chains can serve to achieve both economic and conservation goals. The potential economic opportunities of the forestry sector this is discussed below.

Timber

Here we estimate the potential market value of timber, by using the data from the national forestry inventory of 1999. We assumed a 1.5% annual growth and allocated 40% of increment as allowable cut as per the Forestry Inventory Guidelines of the Department of Forests issued in 2001. We also assumed that an average value for timber of all species at Rs. 250/cft for the altitude range of 0-1000 m and Rs. 150/cft for 1000-3000 m (Table 2).

3521 ha of forest) in Dolakha generated an annual income of Rs. 1,255 per hectare from 24 unprocessed NTFPs in 2006. These 24 species, however, were not the high value NTFPs traditionally traded from Mountain forests (e.g., Yarsagumba, Jatamasi, and Atis). Thus the economic value could be much more for other NTFP-rich community forests, especially in the Mountain areas. We estimate that a potential income from the NTFP sub-sector at national scale comes to Rs 5.31 billion per annum for a total CF

Table 2: Estimated present value of logs by altitudinal class*

Altitude (m)	Reachable forest areas ('000ha)	Stem volume (million cft)	Increment (million cft)	Allowable cut (million cft)	Realistic volume of cut (million cft)	Value in Rs. (million)
0-1000	1224.1	6637.59	99.56	39.83	39.83	9956.39
1000- 3000	897.9	6270.60	94.06	37.62	18.81	2821.77
3000-Above	57.2	2018.44	30.28	12.11	-	-
Total	2179.2	14926.63	223.90	89.56	58.64	12,778.16

*Assumptions

- 1) Average value for timber (log) of all wood species:
Altitude class (0-1000) = Rs. 250/cft
Altitude class (1000-3000) = Rs. 150/cft
- 2) Average incremental growth rate is 1.5% (for slow growing species the least value recommended is 1% and for the fast growing species, it is about 3%)
- 3) Average allowable cut for all wood species is assumed to be 40% of the annual increment; the recommended least value for this is 40% for the poor forest site and 60% for the average forest site
- 4) For the altitudinal region of 1000-3000 m, 50% of the allowable cut is considered to be a realistic.
- 5) 1 m³ = 35.31 cft

With these assumptions, we estimated an annual harvest of 58.65 million cft of timber, with a value of Rs. 12.78 billion. Our experience in Dolakha suggests that two-thirds of the total timber sales from a CFUG go to generate local employment. Assuming a daily wage rate of Rs. 200 per person, the timber subsector can generate 42,593,850 person-days of employment for local people, or an equivalent of 180 days a year or 6 months employment for 236,632 people.

Non-timber forest products

There is no inventory data for NTFPs, on par with timber species, except in some areas under project support. For instance, the data from ANSAB projects in Dolakha and Bajhang districts suggest a very high potential for raising income and employment from the NTFP sub-sector if comprehensive support on market information, business development services, financial services and access to technology is availed to the local people. Ten FSC-certified CFUGs (with

area of 1,057,827 hectares in Hills and Mountains. For this, we assumed that 40% of the total community forests have potential for NTFPs. The estimate would go up if Yarsagumba, Jatamasi, Atis and high volume products like resin are included. The value addition in marketing chains (processing, grading, and packaging) would further generate income and employment opportunity. Similarly, the NTFP sub-sector can generate 26,550,000 person days of employment for local people or an equivalent of 6 month or 180 days a year employment for 147,500 persons.

Environmental services

PES is another source of revenue that can grow in the years to come. In our study, we found that mountain forests provide such services as carbon sequestration, recreational use, scenic beauty, watershed protection (irrigation, drinking water, hydropower, flood and sedimentation control), biodiversity conservation, soil formation and

replenishment of fertility, pollination, and colonisation (Subedi and Singh, 2008). These services have considerable potential for generating income to the local people. Because of the growing popularity of Nepal's varied cultural and ecological diversities, eco-tourism would be an attractive option for some communities.

Carbon sequestration from forest biomass is another opportunity that can be tapped by Nepal through carbon trading. After Bali Action Plan 2007 and Copenhagen Accord 2009, reducing emissions from deforestation and forest degradation (REDD) plus has evolved as an important mitigation tool for climate change, providing opportunities for income through conservation and sustainable management of forests and the enhancement of forest carbon stock. Though REDD is still at the initial stages, it provides a good opportunity for Nepal to enhance forest carbon and claim payment for carbon credits.

Recommendations

The harnessing of the potentials of the forestry sector requires concerted effort from the government, donors and other actors. The following are the main areas where interventions should be focussed.

Organize community for resource management and enterprises

A first important step towards realizing the economic potential of forest resources can be the organizing of the local communities to initiate forest management and forest-based enterprise activities. Organizing the community into an appropriate management structure facilitates the management to achieve conservation and economic goals. This is a rigorous process that requires significant time and resources.

Establish small and medium forest enterprises

Similarly, efforts should be directed towards supporting the local community to establish and run small and medium forest enterprises (SMFEs) in a sustainable basis. These enterprises should consider environmental and social aspects, market requirements and policy provisions. For the enterprises to work, development agencies should offer a package of business development services (BDS) that include skills training, information services and financing.

Integrate community enterprises to rewarding value chains

The enterprises will not benefit the local community if they are not linked to rewarding value chains. It is thus important, even if difficult, to foster and sustain business partnership of the community enterprises with the more powerful actors in the market. It is especially the responsible business entities that provide price premiums on conservation and community effort. Thus, development organizations should identify those business entities and facilitate partnerships within fair and transparent value chain governance. The communities should be supported to explore most promising value chains and try innovative marketing strategy (especially through forest management and chain of custody certification as well as fair trade).

Address key policy bottlenecks

Similarly, policy revisions should be pursued on a continuous basis to address the barriers that hinder the operation and growth of forest enterprises. These barriers include, for instance, arbitrary royalty rates for forest products, lengthy and costly export formalities, the ban on collection and trade of NTFPs, contradictions between forestry and other laws, and cumbersome formalities on enterprise establishment. The issues should be constantly identified through multi-stakeholder consultation processes and addressed in time.

Design and operationalize the REDD plus mechanism

REDD plus has evolved as a promising opportunity, but requires considerable effort in clarifying how it works within the participatory forestry program of Nepal. It requires resolving key technical and social issues—especially on how to make it rewarding to local communities. Therefore, REDD plus piloting in different social and ecological contexts should be designed and implemented for experiential learning and innovation.

Adopt a strategy for import substitution

Despite being considerably rich in forest resources, Nepal currently imports a huge amount of finished forest products, particularly plywood, furniture, veneer, paper, wooden handicrafts, boards, and herbal products from several neighbouring countries. Government of Nepal should devise strategies to engage the corporate and co-operative sectors to invest in forest based industries to meet the needs

of local and global markets. Laws, policies and support interventions should be designed to this end.

References

- DOF. 2006. **Hamro Ban**, Annual Report of the Department of Forests for FY 2061/62, Department of Forests, Kathmandu, Nepal.
- DOF. 2007. **Hamro Ban**, Annual Report of the Department of Forests for FY 2062/63, Department of Forests, Kathmandu, Nepal.
- DOF. 2005. **Hamro Ban**, Annual Report of the Department of Forests for FY 2060/61, Department of Forests, Kathmandu, Nepal.
- Kanel, K. R. 2004. Twenty-five years of community forestry: contribution to millenium development goals. In *Twenty-five Years of Community Forestry: Contributing to Millennium Development Goals* (eds.) Kanel, K.R., Mathema, P., Kandel, B.R., Niraula, D.R., Sharma, A.R., Gautam, M. Proceedings of the fourth national workshop of community forestry, 4-6 August, 2004. Community Forestry Division, Department of Forests, December 2004, Kathmandu, Nepal.
- Subedi, B.P. and Singh, S. P. 2008. Ecosystem Services of Forests in Nepal and Uttarakhand Himalayas: A few observations based on a Pilot Study. **Payment for Environmental Services, Some Concept and Experiences**, (ed.) Bhatnagar, M. The Icfai University Press, Hyderabad, India.
- Subedi, B.P. 2006. **Linking Plant-Based Enterprises and Local Communities to Biodiversity Conservation in Nepal Himalaya**, Adroit Publishers, New Delhi, India.