

# Economic Value of Cultural Ecosystem Services: An Assessment from Protected Forest of Nepal

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**Abstract:** *Forests provide numbers of cultural ecosystem services for human wellbeing. However, the importance of cultural ecosystem services arising from forests is poorly recognized in developing countries like Nepal. The present study has estimated economic value of cultural ecosystem services provided by Panchase Protected Forest of Nepal. Travel cost method was adopted interviewing 388 people to estimate the value of cultural and recreational services. The analysis revealed that total annual economic value of cultural ecosystem services of the Panchase Protected Forest is NPR 37.84 million (USD 378,395). It is estimated that 25,340 pilgrims and 3,600 tourists visit every year in the Panchase Protected Forest. Promotion of tourism as an economic opportunity for local people and the society are crucial for better protection of protected forests. Provision of entry fee will help in regulating tourism in protected forests. Inclusion of aesthetic and cognitive benefits will worth in future cultural ecosystem valuation researches.*

**Keywords:** ecosystem services, protected forest, travel cost method, valuation

## 1. Introduction

Since the Millennium Ecosystem Assessment (MEA), ecosystem services science has made much progress in framing concepts and approaches [14]. MEA [11] classifies ecosystem services into four broad categories viz. provisioning, regulating, cultural and supporting services. Later, the Economics of Ecosystem and Biodiversity (TEEB) slightly modified the MEA categories of ecosystem services into provisioning; regulating; habitat; and cultural and amenity services. Costanza et al. [2] argues that the TEEB framework added more of the economic aspect of ecosystem services. However, approaches informing understanding of cultural ecosystem services remain the subject of ongoing debate [8].

Cultural ecosystem services encompass the 'non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences [11]. Recently, Fish et al. [8] developed a framework on cultural ecosystem services and distinguishes four types of cultural practices with regards to ecosystem services viz. playing and exercising; creating and expressing; producing and caring; and gathering and consuming.

The failure to account for the full economic values of ecosystems has been a significant factor in their continuing loss and degradation [11]. Ecosystem valuation enable estimates the value of goods and services provided by the ecosystems to create incentive mechanisms [5]. As the benefits received from ecosystem services are usually neglected or undervalued in decision-making due to the lack of market prices of such services, valuation show how conservation can deliver a range of economic advantage [15].

Despite smaller in size, Nepal is rich in forest resources as it covers 44.74% (6.61 million hectare) of the total area of the country [6]. There has been a long tradition in Nepal that forest is a source of leisure and recreation. Protected areas in Nepal recognize recreational services of forests keeping

wildlife and nature base tourism in a priority. Nepal has established 20 protected areas covering 23.23% of the total area of the country [9]. Considering the importance of biodiversity and environmental safeguards outside protected areas, Nepal initiated protected forests, a new forest management regime in 2012 [7]. Protected Forest is a special category of forest balancing human needs through conserving biodiversity and safeguarding environment [13]. Forests provide numbers of ecosystem services, including cultural services. However, the importance of cultural ecosystem services arising from forests are not properly recognized outside the protected areas in Nepal. Protected forests assumed to provide numbers of cultural ecosystem services, however, the understanding and importance of such services provided by forests are not properly recognized [12]. Therefore, valuation of cultural ecosystem services is crucial in identifying economic benefits provided by the forests. The present research aimed at valuing cultural ecosystem services of a representative protected forest highlighting religious and recreational values.

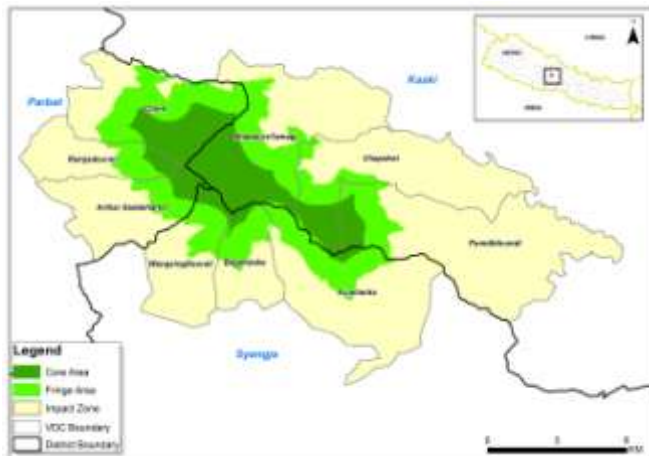
## 2. Materials and Methods

### 2.1 Study area

This study was conducted in Panchase Protected Forest. Comprising 5,775 ha at the juncture of Kaski, Syanja and Parbat districts, it represents the mid-hills forests of Nepal. The protected forest is rich in biodiversity as it has wide range of altitudinal variation from 900 m to 2517 m. Over 589 flowering plants including 107 medicinal and aromatic plants and 113 orchids, 56 species of wild mushrooms, and 98 species of ferns have been recorded in the area [7]. The Panchase Protected Forest is also important due its cultural values. Panchase peak and Panchase Lake are the major natural heritages within the forests whereas it is a vintage point for the natural landscape with a panoramic view of the Himalaya range including Mt. Annapurna, Mt. Machhapuchre, Mt. Dhaulagiri, and Mt. Manaslu. Cultural-religious heritages within the forest include Siddhababa temple, Siddhabarah temple, Harpandevi, Buddha temple,

and cremation site of Shrawan Kumar [7].

The PPF has been zoned as core area and fringe area. Core area includes 2,035 ha as the innermost area and fringe area includes 3,740 ha of outer area. An impact zone has been declared around the PPF that covers the settlements within nine Village Development Committees (VDCs) - three VDCs of each Kaski, Parbat and Syangja districts. A total of 26,025 people resides in the impact zone within the 7039 households [1].



**Figure 1:** Panchase Protected Forest showing core area, fringe area and impact zone

## 2.2 Key Informants Interview

Key Informants Interview (KII) was employed to identify cultural and religious sites and events, natural heritages, recreation sites, trekking routes, strategic locations for visitors, and other information related to cultural services. PPF council members, community forest user group members, hoteliers and village leaders were selected as key informants. A total of 10 key informants were interviewed within the study area. A checklist was prepared before the interview to systematically collect the required information.

## 2.3 Travel Cost Method

Travel Cost Method (TCM) was used to estimate economic value of cultural and amenity services. It is based on the rationale that cultural and recreational experiences are associated with a cost (direct expenses and opportunity costs of time). TCM is a well-known technique that uses the costs that visitors bear in travelling to a recreational site [10]. TCM is a survey technique where questionnaire is often prepared and administered to estimate the recreation value of a site [4].

### 2.3.1 Religious travels

Religious value was estimated based on the number of pilgrims visit to the Panchase Protected Forest for religious or cultural motives. People mostly visit to the PPF during Balachaturdasi, the most famous religious occasion in this region. Since most of the pilgrims are from the impact zone (as identified by key informants' interview), a questionnaire survey was conducted in the impact zone of PPF in April 2017 under the TCM framework. Out of the total 7039

households in the impact zone of the Panchase Protected Forest, 364 was selected (at a confidence level of 95% with a marginal error of 5%) for the survey using standard sample size calculation formula. The samples were distributed in all 9 VDCs proportionately. The number of days to be spent in PPF as a pilgrim, transportation costs and other associated costs were captured through questionnaire. The number of days was converted into the monetary value using the average wage rate of the study site as an opportunity cost of unskilled labor. Opportunity cost of time, transportation cost and other associated costs were taken into account to calculate religious value of an individual pilgrim. Total religious value was calculated through multiplying the value of individual pilgrims by total number of pilgrims per year.

### 2.3.2 Recreational travels

Recreational value, which is associated with the tourists who visit to the protected forest for recreation, was estimated through a questionnaire survey with visitors under the TCM framework. A total of 24 foreign visitors were surveyed, in April 2017, in Bhanjyang, the most strategic place on the trekking route to Panchase peak. Since there is no any formal record keeping system for the visitors in the study area, consultations were made with the hoteliers in Bhanjyang and Panchase peak to estimate the number of visitors. Due to unavailability of reliable information on domestic visitors, only foreigners were counted in for this research. Cost of accommodation and food, transportation cost and other associated costs were taken into account to calculate individual recreation value. Then the individual value of sampled visitors was totaled and averaged to calculate average recreational value. Total recreational value was calculated through multiplying average recreational value by the total number of visitors.

Total religious value and total recreational value was added to calculate the value of cultural ecosystem services.

## 3. Results and Discussion

### 3.1 Religious value

This study verified that the Panchase Protected Forest is rich in religious and cultural assets and values. Siddhababa temple at the top of the hill and Panchase lake just beneath the peak are the most popular religious and cultural destinations within the protected forest. A large number of pilgrims, mostly Hindus, visit to the PPF during Bala-Chaturdasi every year. The Bala-Chaturdasi, the most famous festival in this region, is celebrated every year on the 14th day of the dark-half of the lunar calendar in the month of Mangsir (late November or early December). The worshippers scatter "Satbij", seven types of grains and seeds, along the path as they go. The seeds are scattered on behalf of deceased relatives in the hope that this act will secure a better place in heaven for them. These rituals are also carried out to appease the restless souls of departed ones who were not properly cremated.

The results of the TCM survey reveal that total religious value of the PPF is Nepalese rupees (NPR) 23.44 million

(USD 234,395 at the conversion rate of USD 1= NPR 100) per annum (Table 1). It is estimated that 25,340 pilgrims visit to the PPF every year during Bala-Chaturdasi. Out of them, 19,005 (75%) are from the impact zone of the PPF and 6,335 (25%) are from outside the impact zone. The pilgrims from the impact zone spend a day and half for the festival whereas pilgrims from outside the impact zone spend two and half days in an average to visit the PPF. Average wage rate of the study site (NPR 500/day) was used to calculate the opportunity cost of time. The average transportation cost for pilgrims outside the impact zone of the PPF is NPR 200 per trip whereas pilgrims from the impact zone usually walk instead of using vehicles.

**Table 1:** Economic value of cultural services in the PPF

Value/services	Economic value	
	NPR (million)	USD
Religious	23.44	234,395
Recreational	14.40	144,000
Total (cultural ecosystem services)	37.87	387,395

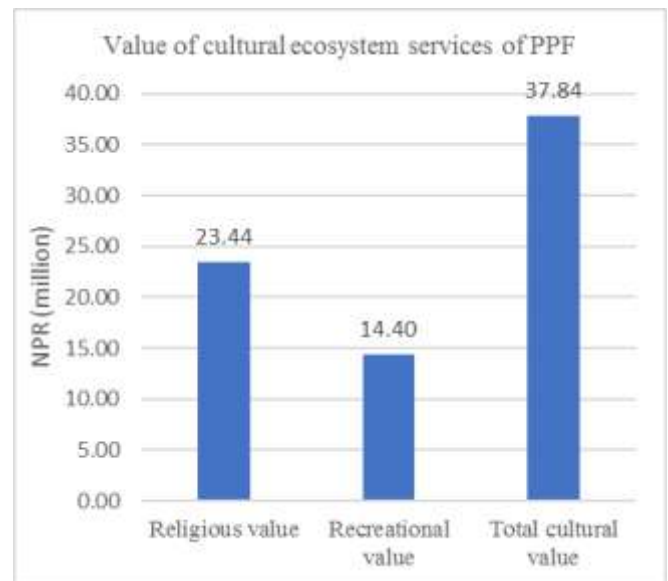
### 3.2 Recreational value

There is a huge potential of tourism in the Panchase Protected Forest as it is very close to the Pokhara city, one of the major tourist hubs of Nepal (CSUWN, 2011). PPF offers magnificent views of Mt. Dhaulagiri, Mt. Manaslu, Mt. Machchhapuchhre, and Mt. Annapurna. It has become an easily accessible destination reached by seasonal roads linking all villages and to the Bhanjyang. The trekking routes within the PPF are: 1) Bhadaure-Bhanjyang-Panchase; 2) Pame-Bhanjyang-Panchase; 3) Pumdibhumdi-Bhanjyang-Panchase; 4) Kusma-Arthar-Bhanjyang-Panchase; 5) Kusma-Arthar-Panchase; and 6) Sirubari-Arthar-Bhanjyang-Panchase. Bhanjyang is the main junction from where tourist climb up to the top of the Panchase hill. Tourists can stay at Bhanjyang where hotel facilities are available. Homestays are also increasingly available in the villages within the impact zone of the PPF.

The results of the travel cost method reveal that the recreation value of the Panchase Protected Forest is NPR 14.40 million (USD 144,000) (Table 1). Based on the survey with the hoteliers in Bhanjyang and Panchase Peak, it is estimated that 3,600 tourists visit to the PPF every year during autumn (September-November) and spring (March-May). Tourists spend two days in the PPF in an average. There is no any entry fee provision in the Panchase Protected Forest. No tourists were found to come only for Panchase, but they allocate few days while visiting to Pokhara. Thus, transportation expenses include only from Pokhara to Panchase and vice versa, was estimated NPR 1,000 per trip. Average expenses of visitors in the PPF for accommodation and food was NPR 1,500 per day. As this study does not count the domestic tourists and only foreigners are considered, it underestimates the recreational value. The recreational value can be further increased through promoting tourism and improving tourism facilities. Provision of entry fee not only regulate the tourism but also increases the value.

### 3.3 Value of cultural ecosystem services

Analyzing the religious value and recreational values, the study results reveal that total value of cultural ecosystem services of the PPF is NPR NPR 37.84 million (USD 378,395) per annum (Table 1; Figure 2). The religious value is higher compared to the recreational value. It implies that the Panchase Protected Forest is a very important destination for religious and spiritual purpose. The lower recreational value of the PPF is due to its under estimation because this study accounted only the foreign visitors. Increase in publicity and tourism infrastructure will help in increasing number of tourists and thus the recreational value. This finding implies that protected forests are not only important for conserving biodiversity and environmental safeguards, but also provides cultural and economic benefits.



**Figure 2:** Value of cultural ecosystem services

## 4. Conclusions

This study concludes that protected forests are not only important for conserving biodiversity and environmental safeguards, but also important for cultural and economic benefits. The annual economic value of cultural ecosystem services of the Panchase Protected Forest is NPR 37.84 million (USD 378,395). A total of 25,340 pilgrims and 3,600 tourists visit to the Panchase Protected Forest each year for their cultural and recreational needs. Promotion of tourism is crucial for better management of protected forests as it creates an economic opportunity to benefit local people and the society. Provision of entry fee will help in regulating tourism in the targeted forests.

This study highlights the religious and recreational values of the protected forest. Inclusion of aesthetic and cognitive benefits will worth in future cultural ecosystem valuation researches.

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