## Recommendation

Community Forests; Samdrupcholing, Tashithang, Juenphen, Chakgari, Tareythang B and Dangling CF can be replicated similar to Dungmin CF (reference CF) ecologically for increasing the habitat size, availability of food and lessen the competition for wildlife.

Except for Dangling and Dungmin CFs, other CFs has to be managed for timber production as it lack the good timber species naturally growing in it, thus requiring the plantation of timber seedlings. The management for NTFP production should be CF specific based on availability and regeneration potential of NTFP in the CF. Samdrupcholing and Tashithang CF should focus on growing NTFPs; B*ambusa nutans* and *Thysanolaena maxima* to gain monetary benefit. Dangling, Dungmin, Chakgari CFs should manage CF for NTFPs such as firewood and Thysanolaena maxima because the ranking score have least difference, showing the equal importance for livelihood.

Samdrupcholing, Dangling, Dungmin, Lingar, Juenphen, Rijug, Tirkhola CF should maintain good green cover in the catchment area to recharge aquifer for drinking and irrigation of fields. Rijug CF showed ecological disturbance which requires restoration based on the interest of CFMG without compromising the ecological need by the wildlife.


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The Rufford Foundation

# Ecosystem Services valuation of Sarpang districts: An assessment for conservation and livelihood

# Ecosystem Services

## Community Forest and Ecosystem Services

Community forestry in Bhutan provides opportunities to rural people and remains as major influence to the development of forest policies. Mainstreaming the information of ecosystem services into policy and decision making is explicitly dependent on holistic investigation of ecosystem.

The economic valuation on ecosystem services is recognized tool for sustainable management of forest for socio-economic benefits and ecological resilience. Bhutan with 72.4% of forest cover and 70% marginalized rural people calls to materialize the issues on poverty and conservation following the principle of 'Ecosystem Services Approach'.

## Project description

The project site is located in Sarpang district in southern central belt of Bhutan in the latitude of 27.45198 and longitude of 90.4880° E. The project was assessed ecologically, socially and economically to approach holistically to develop plans to balance between forest resource extraction and conservation. The assessment made were;

I. Ecological: Quantitative characteristics of vegetation was studied to assess community dynamics and recommend diversity similar to reference Community Forest (CF) to host IUCN red list categorized species.

II. Social: The presentation to rural people about ecosystem services and community forest has encouraged more participation towards conservation and built sense of ownership towards community forest. It contributed un-biased fundamental rights and duties for resource use and instilled the knowledge of ecosystem services for livelihood.

III. Economic: Quantitative Forest Resource Assessment

will guide the resource management of CF to improve ecosystem services of interest. Finding the monetary strength of CF will help to translate external, non-market values of the CF into real financial incentives for rural people.

## Project result

Ecological assessment showed most community forests are having low species diversity and disturbed forest community for the delivery of ecosystem services. However Dungmin (reference community) and Dangling community forest have higher species diversity which are capable of supporting wildlife.

Unlike other CFs, Lingar, Gaden and Tirkhola community forests cannot be replicated similar to reference CF due to nature of soil and altitude differences. The replication of forest community would help to provide niche to threatened animals such as *Elephas maxima, Panthera pardus* and *Coun aplinus*.

The CFMGs are focused on managing the forest primarily for provisioning services such timber and NTFPs by planting the timber species; *Tectona grandis, Michelia champaca, Dalbergia sissoo* and NTFPs; *Bambusa nutans, Thysanolaena maxima, Piper nigrum* etc.

All provisioning services harvested are floral based and no monetary benefit is acquired by obtaining the animal products. 81% CFs are focused on collecting *Thysanolaena maxima due* to quick growth, availability, market demand and less time consumed while collecting it. Other NTFPs were not focused much due lesser in quantity and lack of market. However CFMGs collects if required.

The total monetary benefit obtained from 11 CFs by collecting the NTFPs was Nu. 0.207 millions (USD 3199) till date and the monetary value of non consumptive use values for the year 2016-2017 is Nu. 16.11 millions (2,47,907). Although the community forest provides water services for drinking and irrigation, the scope for PES (Payment for ecosystem services) is less due to the lack of service buyer which is significant in PES deal.