

## Assessing the Feasibility of the Ecosystem Management Approached on Community Forestry System in Nepal

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### Abstract

The paper is exploring the problem, situation and relation between the ecosystem management approached and Community Forestry (CF) management system of Nepal, has recommended further step to adopt ecosystem management approached in CF in Nepal. Thirty four percent of total forest of country has already handover to user as the CF. Out of them near about one percent of community forests are protection oriented which has met ecosystems management principles. CF handover process is increasing year by year and Government has targeted to handover 61% of Forest land as community forest. There are many problems in CF which is difficult to meet ecosystem approached i.e. forest product distribution, benefit sharing, resource utilization, good governance etc. Heavy silviculture system is applying in CF with out thinking to habitat for insect, wildlife. CF is leading towards economic and livelihood subsistence of local people. There is less consideration for whole ecosystem management approached in CF. Therefore, at least 25 % of CF area should be left in natural stage without the human interfere which will be provided habitat for other ecosystem component such as insect, birds, wildlife etc.

**Key Words:** Community Forestry (CF), Ecosystem approached, benefit sharing, forest size etc

### INTRODUCTION

#### Community Forestry and Ecosystem Management

The Government of Nepal (GN) has introduced community forestry during the late 70's as a strategy to preserve the degraded hills of Nepal and to provide basic needs of forestry products to the rural people (Acharya 2002; Malla 2000; Hobley 1996; HMGN 1995; HMGN/ADB/FINIDA 1989 and Gilmour and Fisher 1991). Participatory forestry program evolved in Nepal in 1990s with the evolutionary changes in forest policy, which was legitimized in 1993 (Paudel and Pokharel 2001). The program has received highest priority within the forestry sector and is regarded as one of the most successful development program in Nepal. The community forest, a common property, is managed by the community (Maskey, et.al 2003). Community forestry in Nepal is "user-group" forestry as defined in Forest Act 1993 and Forest Regulations 1995, where the local users of a resource are organized as a 'Community Forest User Group' (CFUG) who are entrusted with the responsibility of conservation, utilization, management, and development of the forest resources.

Community Forest Users Groups (CFUGs) should have to prepare Forest operational plan with the coordination with District Forest Office (DFO), forest management plan and constitute must be approved by DFO for 5-10 years (Springate-Baginski, O. et al.2003)

Community forestry in Nepal has been evolving towards the complete participatory management by user group, where the users utilize and manage forest resources. The initial state was participatory conservation of environment through planting of trees which later developed into institutional

**Table 1: Status of Community Forestry in Nepal (Source DoF 2007)**

Total land area of Nepal	14.7 million ha
Total forest area	5.5 million ha
Potential community forest area	3.5 million ha
Forest area under community forestry	1,219,111 ha
Total no of CFUGs in Nepal	14,337

development of community forest user groups where the forest management and resource control was undertaken by the user groups. Later the objective of community forestry expanded towards mobilization and empowerment of the user group towards development of the rural community (Kanel, 2004)

The Ecosystem Approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (Shepherd, 2004). Ecosystems management is integration of ecological, economic, and social principles to manage biological and physical systems in a manner that safe guards the ecological sustainability, natural diversity, and productivity of the landscapes (Wood, 1994).

Ecosystem approached and principles are well fitted in some community forests which are still protection-oriented. The community forestry programme has been challenged and its success questioned by commentators due to passive, protection-oriented management (Nurse *et al.*, 2004). Active protection oriented community forestry are more involve in conservation of floral diversity for their short term benefits as well as protection of other faunal and ecological and environmental diversity for their long term benefits.

### Situations and problems to implement Ecosystem Principle/Approach in CF

Community forestry (CF), one of the most successful approaches of the forestry sector, is defined as a process through which government transfers the responsibility of managing forests to the communities and recognizes latter's right to use on sustainable basis (Kanel, 2004). This implies that there is a significance of sustainability concept in the community forest management.

Master Plan for Forestry Sector (1989) and Revised Forest Policy (2000) have clearly identified and mentioned the role of community forestry linking to its expected output, which is possible only through sustainable management practices. Accordingly, community forestry has been envisaged in the Tenth Plan as a means of poverty reduction and fulfilling basic needs of forest products. Besides, it is also a means of conserving ecosystems and genetic resources, and an instrument to protect land against degradation and other effects of ecological imbalance. Hence, sustainable community forest management considering whole biological diversity is the only a way to meet principle objectives of Ecosystem Principles.

Community Forestry (CF) management system is base on the sustainable utilization of forest products, it is focusing the local people basic needed, therefore most of the ecosystems management principles are innocently follow by the CF, however some of principle of ecosystem management has not been achieved by CF. Here I am going to discussing about “is community forestry adapting ecosystem management principles?.

#### Box-1. Principles of the ecosystem approach

**Principle 1:** The objectives of management of land, water and living resources are a matter of societal choice.

**Principle 2:** Management should be decentralised to the lowest appropriate level.

**Principle 3:** Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.

**Principle 4:** Recognising potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context

**Principle 5:** Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.

**Principle 6:** Ecosystems must be managed within the limits of their functioning.

**Principle 7:** The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.

**Principle 8:** Recognising the varying temporal scales and lag-effects that characterise ecosystem processes, objectives for ecosystem management should be set for the long term.

**Principle 9:** Management must recognise that change is inevitable.

**Principle 10:** The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.

**Principle 11:** The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.

**Principle 12:** The ecosystem approach should involve all relevant

Comparison of 12 Ecosystem Principles with situation and problems of Community Forestry Management System in Nepal as follows:

I. **Principle 1, 11 and 12 and Community Forest**

The main objectives of the community forestry system are sustainable utilization of Natural resources, conserve land resource from natural disasters and provide human basic need. CF management system is based on the site specific giving high emphasis on local economic status, cultural, indigenous knowledge. CF management plan considers all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices. The people living near by the forest are main stake holder of the community forestry who is using resource from ancient time. The forest management rules and regulation integrate indigenous knowledge and encompassing their intrinsic values and for the tangible or intangible benefits for humans, in a fair and equitable way but in practice the Community Forest Users groups don't give more emphasis in Wildlife conservation, because they are more specific in forest management and their basic needs. Intensive silviculture systems are using in their community forest, so there is no habitat for insects, and large mammals due to heavy thinning pruning and clearing of their forest. Therefore, the CF system is following the ecosystems management principles 1 in terms of forest trees, water conservation rather than wildlife, insect, birds' conservation.

**Benefit sharing bias**

CF has provided tangible benefits to rural communities with easy access to forest resource. However, equitable distribution of forest products has not been practiced because of less involvement of poor, women, and *Dalit* (lower cast) in decision-making. Besides, the operation plans (OPs) have often excluded the landless and the poor, e.g. blacksmiths and charcoal producers. Furthermore, by not utilizing the sustainable harvest and growth potential, opportunities for generating income for the community and the poor were lost (Shrestha, et.al 2004). Similarly, in some cases, it has excluded some households from membership though they have been traditional users, e.g. transhumance livestock owners and collectors of medicinal and aromatic plants (MAPs) (Shrestha, et.al 2004).

II. **Policy unclear in benefit sharing:**

Ecosystem principle says that there should be equal benefit shared among the stakeholder among users to government. Recent policy of the government to tax the sale of some major commercial species from the community forests has created confusion among the users. Taxation has basically two principles: i) contain negative externalities or internalise social cost associated with production process and utilities, and ii) ensure equitable distribution of income. As CF creates more positive externalities in environmental aspects, there is no rationale to internalise social costs. In order to ensure equitable distribution of income identification of the basic level of consumption is critical. The Terai forests are commercially valuable and also a major source of government revenue (DoF 2005). If these forests are handed over to the CFUGs, what should be the revenue sharing process and mechanism between the government and the CFUGs? Presently, the government collects 15 percent of the revenue from the sale of surplus *sal* (*Shorea robusta*) and *khair* (*Acacia catechu*) timber obtained from the community forests. One of the objectives of sustainable community forest management is to improve livelihood of poor and disadvantage groups, but, due to political and socio-cultural barriers, this is very difficult. The livelihoods of these groups have not improved as expected (NUKCFP, 2000).

III. **Principle 2 and CF**

CF system is one of the popular examples of power decentralized systems where the forest management rules formation, forest products distribution, benefit sharing mechanism make by users themselves. CF systems is principle of Good Governance (accountability, participation, benefit sharing, ownership feeling,...) but there is conflict on forest product distribution, it was distributed on equitable base but now concept has changed as it should be on equity basis i.e. Forest product should be distributed according to number of family member not as a basis of households. So most of the community forestry User groups are distributing forest product and benefit on the basis on the equitable basis (base on number of households). It is main cause of the conflict in much community forest of Nepal. CF almost adapting principle 2 by decentralization of power in lowest level in Community Forest Users Groups (CFUG).

**IV. Principle 3 and CF**

In CF, ecosystem managers mean local users they have equal responsibility to considering there cause and effects of their activities in forest. Local users are using their indigenous knowledge to understanding effects, while District Forest Officers is scientific officer who provides scientific information and justification about there activities effects on forest, so that local user can correct their decision. This is main control mechanism for managing their resources.

**V. Principle 5 and CF**

The CF concept was initiated in 1970s with main objectives was recovery the degraded land by afforestation and conserved land resource from natural disasters such as erosion, fire etc. at that time Government handover degraded land to community but now regime has changed, Government is hands overing forest cover land to local people who are living nearby that forest. Community Forest users Groups (CFUGs) are mostly focus on their basic needs and economics aspects. In terms of trees and Non-Timber Forest Products (NTFPs), CFUGs are doing well jobs but they are least concern about other biological diversity, there is not any specific rules and regulation for the management of birds, insects and mammals diversity in their community forest, therefore, CF systems has not fulfill this principles as conservation of ecosystems structure and functions.

**VI. Principle 6 and CF**

The original vision as mentioned in Master Plan for Forestry Sector was that community forestry should primarily be managed to meet the basic needs of forest products of the members of the CFUG. Forest Act (1993) and the Tenth Plan provide a positive framework for CFUG for introducing commercial management and marketing of the forest products. Commercial utilization raises issues related to equity and ecosystem management. CF forest system is managing on the basis of the local people needs and availability of resource in forest. Local people are considering the ecosystems services and goods but they are not concerning on vertebrate and invertebrate species of the area. They have Forest management plan and they are harvesting their resources on the basis of annual increments of tree, that means they are concern about the function of ecosystem in terms of trees and NTFPs but not in animals species, so the ecosystems management principle has not fulfill by CF.

**VII. Principle 7 and CF**

CF system is bounded by temporal scales and boundaries for management are defined operationally by users, indigenous and local peoples. Government has been handovering certain parts of the Government land where users are managing forest but outside the boundary of community forest there is no control mechanism of forest deforestation, it is due to poverty and some CF has strict regulation. Some CFUGs don't given emphasis for poor and disadvantage groups, these people are depended on Governance forest for timber, NTFPs, which is mean of destroying the connectivity between the community forest even CF don't provide potential habitat for wildlife. Users are not concerning biological diversity characterized by the interaction and integration of genes, species and ecosystems.

**VIII. Principle 8 and CF**

Ecosystem processes are characterized by varying temporal scales and lag-effects. This inherently conflicts with the tendency of humans to favor short-term gains and immediate benefits over future ones but theoretically CF system long term conserve there land resource and provided human basic needs in continue without the degradation of resource. Increasing of population of CFUGs pressure on CF is high so the conflict is rising to gain long term objective.

**IX. Principle 10 and 9 and CF**

Ecosystem approached and principles are well fitted in such many community forests which are still protection-oriented where silviculture practice area not use, leave it in it natural and allow to its function as in own device. Conservation of biodiversity is only appropriated in protected oriented CF with cover only nearly 1% of community forest such community forest are only available where user have high economic status and have own private forest.

The mountain region has low density of population, and extensive area of forests and rangeland, but there exist ecological, social and economical relation with the people living in the Mid-hills, who are also managing community forests (Kanel, 2004). The community forestry model developed and practiced in the mid hills with high density and scarce land is not suitable for the management of mountain forests and rangeland. How to design institutional arrangement so that the resources are sustainable managed

and products are equitably used is a major problem (Kanel, 2004) **Table: 2 Comparison of Community forestry and Ecosystem Approach ( EsA)**

<b>Comparison criteria</b>	<b>Community forestry</b>	<b>EsA</b>
<b>Primary concern...</b>	Basic concern in basic need of local people, fuel wood, timber, fodder. Not concerning wildlife conservation. High thinning, pruning, cleaning activities	is on balancing – and integrating – conservation and use of biological diversity
<b>Tangibility of goals...</b>	Sustainable harvesting with consider of annual increments.	...is low – equity and sustainability
<b>Resource management Objectives...</b>	Social choice	...are a matter of societal choice
<b>Control of resource Management decisions...</b>	Power decentralized in local users	...is decentralized to the lowest appropriate level
<b>Hierarchical approach...</b>	Mostly use social knowledge for forest management	is replaced by the concept of social learning – “we are learning together”
<b>Spatial scale is considered...</b>	It consider in small scale.	...to incorporate the wider landscape -scale linkages
<b>Knowledge is based on...</b>	Indigenous and scientific knowledge.	..a more balanced use of scientific and indigenous and local knowledge, innovations and practices
<b>Sectoral approach is...</b>	Social approach.	...cross-sectoral
<b>Assumes...</b>	Resilience,	need for resilience, anticipation of change
<b>Associated tools...</b>		...are not yet available. EsA have no case law and need practical testing
<b>Benefit sharing</b>	Equitable basis	Equitable basic
<b>Participation of resource management</b>	House representative involve	Hold related stakeholders
<b>Conflict</b>	Conflict on forest product distribution,	No conflict

#### **Future direction for implementation Ecosystems Approach (EA) in CF**

Shepherd, 2004 suggested five steps implementation of EA, according to these steps, we can implemented EA in our community forestry, however some inputs are already give by our community forestry handover and implementation process. To shifting paradigms of community forestry approached to ecosystems management approached. Implementation of ecosystem approached in community forestry is one of the challenging issues, therefore following steps and future improvement as follow:

#### **Determining the Users and defining the Community Forest (CF) area**

Determination of users and defining the area of CF is main issue of CF in Nepal. CF process is starting with the identification of user of the area, it is base on the local people who are living close to the forest and traditional user of that forest. Users are categories in Primary (Those who are traditional user of the area, living nearest of forest) (A), Secondary (Those people who are living more then 2 km from the area, not traditional users ) (B), and Tertiary (recently migrated people in the area or living far from the forest or who need timber product from the forest) (C). Due to this classification, there is conflict in resource

utilization, so illegal harvesting of timber products also occurred by secondary and tertiary users. Therefore, those people who are living near by the forest since last 20 years should be included in the primary users. In some case of distance basis users categorization also creates problem so it should be users' the traditional use rights and who are depended on the resources. How much area is handover to certain Community Forest Users Groups (CFUG) is another question? It should be in following criteria:

- Accessibility

- Traditional use rights

- Willingness to manage forest as CF

- Capacity of users to manage the forest size.

Consider ecological aspect i.e. flora and fauna availability, maintenance of Minimum Viable Population (MVP) (Grumbine 1996).

### **Ecosystem structure, function and management**

Sustainable utilization and maintain of ecosystem service and ensure the continues delivery of function, structural maintenance are main objectives of ecosystem management approached so sustainable management community base indigenous knowledge integrating with scientific information should be used to CF manage.

### **Function of community forestry as a corridor**

Fragmentation biology is now an active field within conservation biology, with manifold implications for protected area design and management (Lovejoy, 2006). Protected areas of Nepal are situated in different place. Habitat between each protected area has fragmented by human activities, deforestation, and expansion of agricultural land. In this situation CF will be main component the connect each protected area provide corridor for large mammals such as Tiger, Rhino, and other ungulates of the area. Therefore government should be increase process to handover degraded and open land between the projected areas. Recently government has implement Terai Arc Landscape Project with the collaboration of WWF Nepal. its main objectives is to provides corridor for free ranging animals from one protected area to another so they should give main priorities to handover degraded and open land to community user so that recovery of the area by vegetation will be faster than others means. Preference should be given to ecological aspects and sustainable livelihood in Community forest operation plan.

### **Multipurpose management in CF**

Since the new devised active forest management has to be sustainable it should encompass wider issues and values, including ecosystem conservation, and multi-purpose management of the forest in such a way that its capacity to provide goods and services is not diminished. Non-Timber Forest Product (NTFP) can be a typical example to this which can include cultivating NTFPs, identifying new ones and developing markets. Similarly development of other forest based enterprises can be a viable option.

### **Economic, Social, Cultural and Ecological issues**

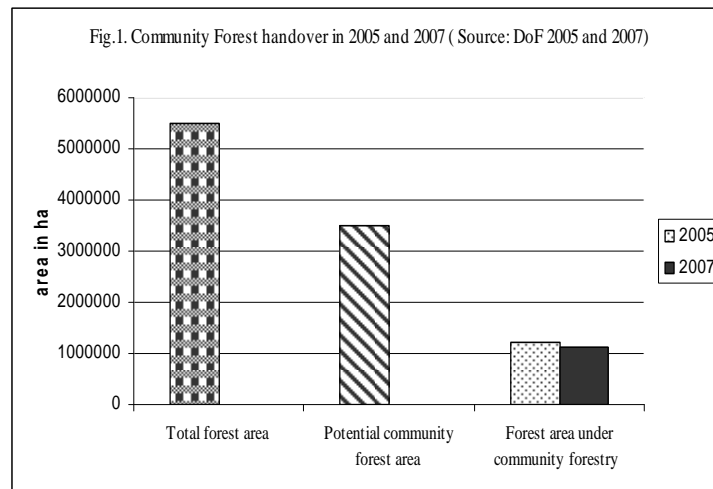
CF is more consideration on social, cultural and economical aspect rather than ecological aspect. Most of the mid hill region consider social and cultural aspect while the Terai region CF mainly consider economical aspect so the community forest system in Terai region is not adopting the CF philosophy. Least consideration of ecological concern in CF is one of the main drawbacks to meet ecosystem approached and principles. Rural community still consumes 69% of energy from fuel wood and this percentage has not decreased, due to simultaneous increase of population each year (Kanel, 2004). It has resulted in the risk of more exploitation of forests for fuel wood. To avoid more exploitation of forests, alternative energy sources and improved cooking stoves should be intensively promoted among the CFUG-members. Sustainable community forest management itself needs to be sustained in order to have perpetual system and practices. Without solving the crosscutting issues like social (gender and social equity), ecological, cultural, the practices of community forest management cannot be met the ecosystem management principle. So, crosscutting issues should be solved through social mobilization process. Proper utilization of community forest should be promoted so that, users can generates optimum benefits. If community forest is appropriate for eco-tourism, CFUG should manage the forest accordingly. This will not only conserve and promote biodiversity but also contribute to livelihood enhancement.

### **Establishing a Core zone in CF**



Out of 61% of potential community forest area 34.1% forest has handover to CFUGs which covered 22% of total forest area of Nepal, which is intensively manage by local people for their basic need without the consideration of ecosystem/biodiversity conservation.

It is show that rate of the CF handover increase by 7.2% /per year (82897ha/year). If this process is continue whole potential CF area will be handover to user within the 27 year. That mean whole potential 61% of country forest will be handover in the year of 2034. Remaining 39% of country couldn't be sufficient to support ecosystem comments therefore at least 25% of CF should be leave it in its natural condition without the human influence, so that it works in its own device and supports to ecosystem component. Therefore each community forest should leave some part of their area at least 25% as a core zone where they should not allowed to use, it should be leave it in natural stage, provide potential habitat for small insect, and maintain ecosystem structure and function.



#### Establishing different story, age class in CF

Community forestry provides basic need of local people, they are managing on the basis of their management plan and harvesting tree on the basis of this management plan. Heavy thinning, pruning, and cleaning activities is common practice in community forestry of Nepal which is destroying the habitat for the small mammals like hare, birds, insect of the area despite these are component of ecosystem. Therefore, different story of their community forest should be maintain which provide optimum habitat for ecosystem components

#### Socioeconomic, decision making, benefit sharing and participation in CF

Age, gender, and household income had significant effects on participation in community forest management. Wealthy households are more likely to participate in higher levels of forest management whereas poorer households participated less. Individuals with higher landholdings are involved in a higher level of decision-making whereas individuals with less landholding participated in lower levels of participation. Women are more involved in community forestry management than men. Lower caste individuals participated more in lower level of participation as opposed to higher caste individuals who participated in a higher level of decision-making. The user right was not equally distributed among different socio-economic groups (Maskey 2003). Therefore, equally benefit sharing among the stakeholders or users should be given priority to meet ecosystem management principle in CF.

#### Adaptive management over time and space

The sustainable management framework for community forestry is provided by Forest Act (1993), Environmental Protection Act (1998), and Local Self Governance Act (2000). The principles that form the pillars of the framework are resource sustainability, fair sharing of benefits, good governance, and collective efforts towards community development. The criteria and indicators for these principles should be developed. So, to monitor the trend of sustainable community forest management over time, a framework for criteria and indicators should be developed involving all stakeholders. These criteria and indicators should be simple, measurable, reliable, useful, cost-effective and agreed by all stakeholders. The include criteria and indicators of sustainability should also be included in the OP guideline (Caudal *et al.*, 2004). Bhatta and Dhakal (2004) have analyzed the existing forest policies and development supports to explore and utilize the potentials and opportunities for socio-political stability. As socio-political stability is an important aspect of sustainability of forests, spatial issues and options should be addressed through applied research and contribute to socio-political stability.

#### Change CFUG attitude towards the ecosystem approach

Human are main component of ecosystem management (Christensen, et.al 1996). It very difficult to meet ecosystem approached in Community Forest (CF) with out the management of users' knowledge and their behavior. Most of the CFUGs leaders are uneducated in Nepal and they don't have scientific knowledge about the forest management, therefore, district forest officer should provides scientific information to low level i.e. CFUGs and motivate them to develop CF approach to Ecosystem management approached.

Increment of human population and poverty is another issue which directly influences the natural resource and pressure goes on CF so the awareness and alternative income generation activities should be implemented to change CFUG attitude towards the ecosystem management approached.

#### **Certification and eco-labeling**

The concerned stakeholders most notably Government and International community should support FUGs to grasp a proliferation of voluntary *eco-labeling and certification* schemes, which again seek to encourage environmentally-friendly resource management practices. In such cases there is often a hope that consumers will be willing to pay a little more for certifiably 'sustainable' products and services, and that enough of this premium will be left over after deducting the costs of certification itself to allow certified suppliers to cover their production costs, which are often higher than the costs of conventional, 'unsustainable' practices.

#### **Development of markets for community forest services**

A holistic approach which interlinks biodiversity conservation and economic development of a country should be considered as it is recognised that development can make conservation 'acceptable' to local communities. All the concerned stakeholders need to look for markets not only for the forest products but also for the services it provides such as carbon sequestration, hydrological services and biodiversity services. One option, which can also support biodiversity conservation, can be the Clean Development Mechanism (CDM) of the Kyoto Protocol, which allows companies in developed countries to offset their carbon emissions through investments in projects in developing countries, which both reduce net greenhouse gas emissions and contribute to sustainable development objectives of the host country.

#### **Ecosystem monitoring**

There should be some form of Ecosystem biodiversity monitoring in the community forests. As targeted by policy documents (Such as NBS 2002; Tenth Five Year Development Plan for Nepal) there should be an immediate field assessment or monitoring with the use of process like biodiversity register and participatory biodiversity/ecosystem assessment. Also, the establishment of permanent sample plots to monitor species composition, growth rates and regeneration should be a part of regular work of District Forest Office.

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