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COMMUNITY FORESTRY FOR SUSTAINABLE FOREST MANAGEMENT AND LIVELIHOODS: A CASE STUDY OF OSOAM COMMUNITY FOREST USERS GROUP

Introduction

Forests make vital contributions to socio-economic development. The following facts explain just how critical forests are in satisfying the needs of the billions of people who rely on forest products and services for food, energy and shelter. At least 1.3 billion people, or 18 percent of the world's population, are living in homes constructed mainly from forest products. Around 13.2 million people are employed in the formal forest sector and at least 41 million in the informal sector. An estimated 2.4 billion people or 40 percent of the population of low-income countries cook with woodfuel, and around 764 million of them use wood to boil their water (FAO 2014).

Involvement in Osoam forest user group has improved members' standard of living. Kampong Thom province, August 2014

In Cambodia, as in other developing countries at a similar stage of development, the forest sector remains a significant contributor to the economy. The sector produced an average of 8.4 percent of GDP from 1999 through 2008 (Koy and Sasaki 2013) and 3.2 percent in 2011, the highest contribution of forestry to GDP in Southeast Asia (FAO 2014). Forests continue to play an important role in rural livelihoods as almost 80 percent of the 15-million-strong population and about 90 percent of the poor live in rural areas (NIS 2013). Moreover, about 2.2 million households (71 percent of the total), mostly living in upland watershed areas and in the Tonle Sap region, rely directly on forests for their livelihoods (NIS 2013).

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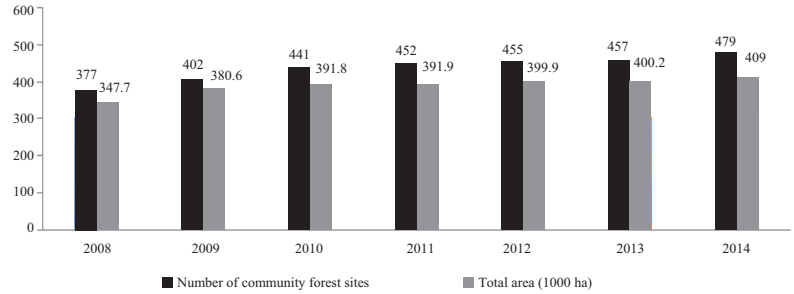
In this Issue

Forest decline clearly represents a direct threat to subsistence resources and income-generating activities central to forest-based local livelihoods. As a percentage of Cambodia's total land area, forest cover has decreased from 73 percent in 1960 to 57.59 percent in 2010, equal to an annual deforestation rate of 0.5 percent (FA 2011). Considered management of the remaining forests is therefore critical to contain deforestation, maintain ecosystems services and the provision of livelihood resources. To ensure sustainable management of forests and enhance the future well-being and socio-economic conditions of forest communities, the Royal Government of Cambodia has integrated community-based forest management into policy and planning (RGC 2013). In the early 1990s, the government approved a community forestry approach to help reduce deforestation (FA 2013; Ty 2013). Under the National Forest Programme, the goal now is to allocate 2 million hectares for community forestry management by 2029 (FA 2013).

Despite wide recognition of the socio-economic and environmental benefits of community forestry in Cambodia, little is known about its achievements and shortcomings or the challenges that sustainability presents, especially after the stoppage of external support. Further, there does not appear to be a widely shared understanding of the concept of sustainable forest management.

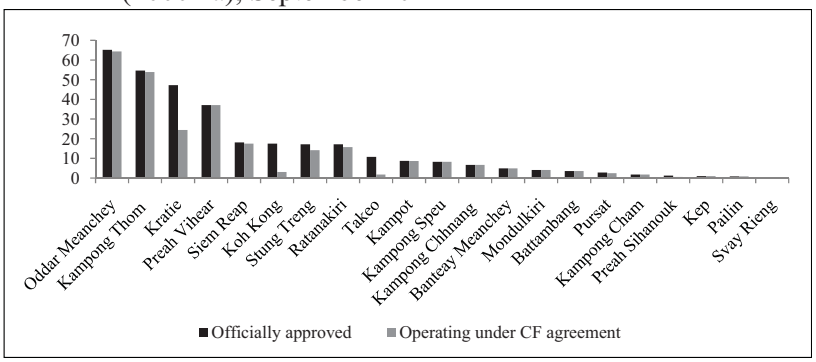
In examining these issues, this article considers three key questions: What is the status of community forestry in Cambodia? What are the contributions of community forestry to forest conservation and livelihood security outcomes? What are the main challenges that have to be addressed for community forestry to be self-sustaining? It begins with an overview of community forestry development in Cambodia, and then explores these questions using a case study and SWOT (strengths, weaknesses, opportunities and threats) analysis of a community forestry project in Sala Visai village, Sala Visai commune, Prasat Balang district, Kampong Thom province.

Figure 1: Number and area (1000 ha) of community forestry sites, 2008-14



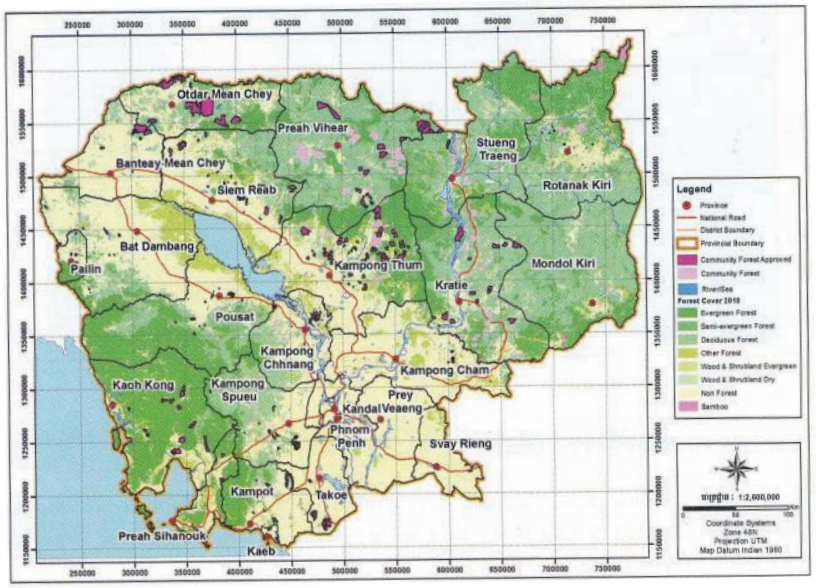
Source: MAFF 2014

Figure 2: Distribution of community forestry sites by province (1000 ha), September 2014



Source: FA 2013

Figure 3: Community forestry areas in Cambodia



Source: FA 2013

Overview of community forestry in Cambodia

By 2014, 479 community forestry groups had been established in 21 provinces covering 409,239 hectares (Figure 1). Of these, 364 (329,587 ha) had

Table 1: Change in the percentage of land under forest cover between 2002 and 2010 in community forestry areas, forest buffer zones and protected areas

Location	Forest cover (%)			Change in forest cover (%)		
	2002	2006	2010	2002-06	2006-10	2002-10
Community forestry areas	89.22	88.15	87.13	-1.07	-1.02	**-2.09**
Forest buffer zones in a 3-km radius of community forest boundaries	64.70	61.23	58.13	-3.47	-3.10	**-6.57**
Forest within protected areas	81.99	80.47	78.72	-1.52	-1.75	**-3.27**

Source: Ty 2013

received official approval and 309 (275,634 ha) were operating under written Community Forestry Agreements between the Forestry Administration Cantonment of the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the community forestry management committees concerned (FA 2013).

As Figures 2 and 3 show, Oddar Meanchey province has the largest area (65,168 ha) under community forestry management, followed by Kampong Thom (54,652 ha), Kratie (47,192 ha) and Preah Vihear (37,063 ha) (FA 2013). Boosted by the REDD[1] Community Forestry Carbon Project covering 67,853 hectares, Oddar Meanchey also has the largest area (64,318 ha) being managed as community forests under Community Forestry Agreements (Ty et al. 2011).

Contributions of community forestry to forest conservation and household income

Forest conservation

A recent study on forest cover change in Cambodia between 2002 and 2010 comparing community forestry areas with adjoining forestland and protected areas found that community forestry offers an effective means of conserving forest resources (Ty 2013). The results shown in Table 1 indicate that the percentage decrease in the land area under forest cover was the lowest in community forestry areas at around 2 percent, compared to almost 6.6 percent in buffer zones and around 3.5 percent in protected areas.

However, despite more than 20 years of decentralised community forest management, deforestation and forest degradation persist and poverty in forest communities endures. The level of forest dependency among people who rely on forest use or traditional farming systems remains high; they have few or no alternative sources of income. Most of the community forestry groups are in the early stages of restoring their forest areas and have yet to prepare their resource management plans (Ty 2013). The plan is necessary for comprehensive resource management and must be officially approved before a community can organise commercial use of its forest resources: commercial logging, for instance, is expected to increase household incomes.

Household income

There has been no assessment of the impact of community forestry on the socio-economic situation of participating households (Sunderlin 2006). That said, because only degraded forest areas with little timber value have been allocated for community forestry, local benefits are limited to collection of non-timber forest products (NTFP): the incomes achieved are barely enough to support let alone improve the livelihoods of local forest-dependent people. In stark contrast, state-owned forests have high economic value, i.e. rare tree species, high-value timber, rich biodiversity and more NTFP, and generate more forest income than private and community-owned forests both per household and per hectare (Jagger et al. 2014). Community forestry development clearly needs much more policy attention and continuous financial and technical support if it is to make any marked contribution to poverty reduction and biodiversity conservation (de Lopez 2004).

A study conducted in 2011 of three communities located next to forest areas in Kampot, Kampong

1 United Nations Framework Convention on Climate Change (UNFCCC) defines REDD+ as "Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries" (Solution Exchange 2010, 1). Activities under REDD+ are reducing emissions from deforestation ("RED"); reducing emissions from forest degradation (the second "D"); conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks (the "+") (Solution Exchange 2010, 1).

Thom and Kampong Speu provinces estimated that forest income contributed on average about 25 percent of total annual household income (both monetary and subsistence), in a range of USD74 to USD151, equal to 303,000 riels to 618,000 riels (± 18,000 to 22,000 riels) (Koy and Sasaki 2013). These estimates were much lower than those of an earlier study which found that the annual contribution of forest income to household income ranged from USD163 (668,000 riels) to USD414 (1,696,000 riels) (Kasper and Top 2006). These observed differences are largely attributable to the different methods used for assessing forest condition. Another study in 2007 to assess the contribution of NTFP to incomes of Phnom Kok (in Ratanakkiri province) community forestry members found that, on average, each collector made about USD79 annually (Kim, Sasaki and Koike 2008). Disaggregated by resource type, plant-based NTFP (food, fodder, medicine, cosmetics ingredients, construction materials and resin) produced average annual income of USD58.5 per collector in a range of USD5 to USD270, and animal-based NTFP (live animals, honey and beeswax, bushmeat, hides and skins, medicine, dye ingredients) about USD50 (Kim, Sasaki and Koike 2008).

Conservation and management of NTFP resources is considered a viable approach to improve the subsistence and cash economy of forest dependent communities (Hall and Bawa 1993). Moreover, this does not take into account a number of intangible monetary values such as stocks of forest resources that are not immediately productive and benefits such as aesthetic enjoyment, recreation, cultural and heritage values, which healthy forest resources and services provide. For example, community-based ecotourism in Chambok, Kampong Speu province, provides alternative incomes and encourages the community to protect its natural areas. Because of the forested landscape, from 2002 through 2010, the community was able to make average annual income of USD10,000 from national and international visitors; in 2011 member households achieved monthly income of about USD10, mainly from ecotourism (Lonn et al. 2012).

Community forestry challenges: Drivers of deforestation and forest degradation

The rates of deforestation and forest degradation are an ongoing issue across Cambodia, even in community forests. Deforestation, defined as "forest changes to another land use, either through human-induced conversion (mainly to agriculture and settlements), or through natural disasters, such as volcanic eruptions, earthquakes or flooding" (FAO n.d., 1), has many negative consequences for the environment. Forest degradation refers to "changes within the forest which negatively affect the structure or function of the stand or site, and thereby lower the capacity to supply products and/or services" (FAO n.d., 2). Efforts to tackle deforestation and degradation require an understanding of the underlying causes as well as the obvious or proximate causes, as summarised Table 2.

The Forestry Administration reported several constraints on sustainable forest management, mainly 1) lack of capable and motivated staff to work in remote provinces, 2) lack of budget and means to implement planned activities, 3) limited knowledge and commitment of staff, 4) weak capacity to control illegal extraction of timber, and

Table 2: Drivers of deforestation and forest degradation

Proximate	Underlying
Unsustainable and illegal logging	Population increase
Overexploitation for woodfuel	Migration into forest areas
Clearance for agriculture	Social norms (claiming land through use)
Expansion of settlements	Increasing accessibility of forest areas
	Regional demand for resources
	Weak forestland tenure
	Lack of a fair, transparent conflict resolution mechanism
	Insufficient land-use planning
	Low economic benefits provided by forests at the national level compared with alternatives
	Low environmental awareness about the roles of forests

Source: adopted from Ngoun 2014

5) lack of cooperation from local authorities and institutions (ACI 2014).

Given the constraints and pace of deforestation and forest degradation, Cambodia may not be able to achieve its Millennium Development Goal of keeping at least 60 percent of the total land area under forest cover in 2015 (FA 2011). In order to meet the target, half a million hectares of land need to be reforested and demarcated as protected areas, and forest communities' land rights consolidated (FA 2011; CDRI 2013).

Limiting the pace of deforestation but at the same time not denying the rural population, especially the poor and the near-poor, is a major challenge for government and society as a whole. Therefore, government and local communities should strive to promote the wise use of forest resources.

Case study of Osoam community forestry project

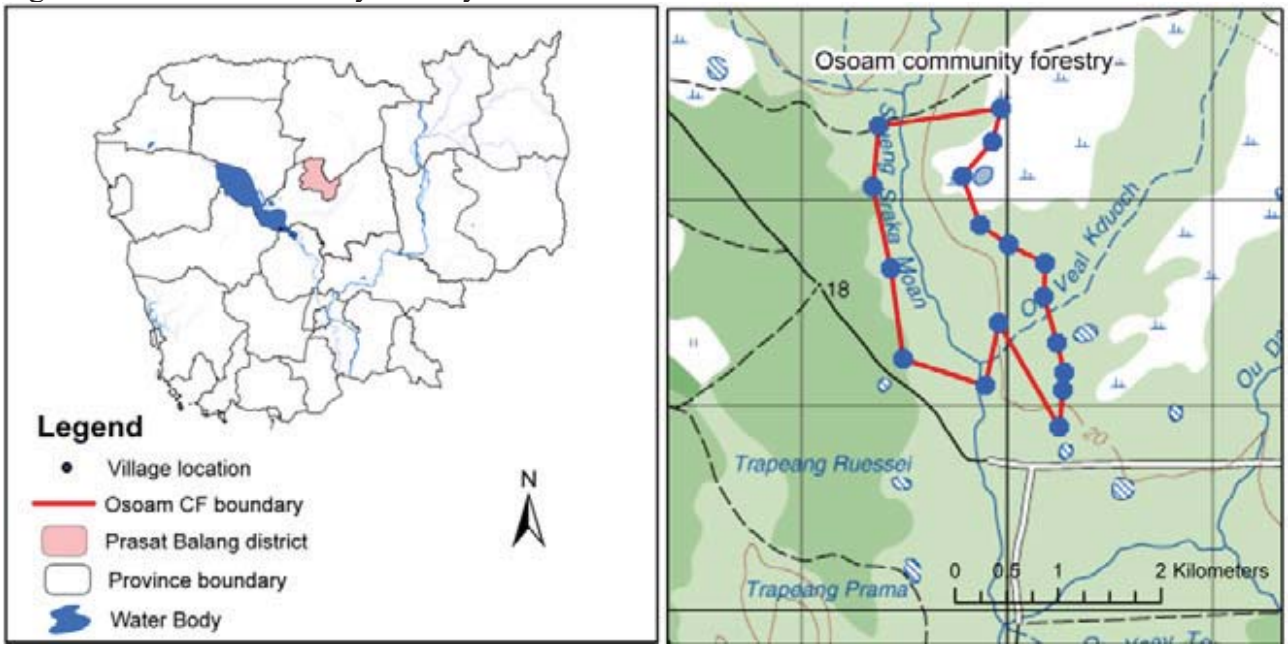
Osoam community forestry project in Kampong Thom province was selected for case study because it provides a good example of best practice in community forestry. It is funded under the project titled "Multi-Function, Forest Restoration and Management of Degraded Forest Areas", developed and carried out by the Institute of Forest and Wildlife Research and Development of the Forestry Administration, with support from the Asia Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) until the end of 2014.

Primary data for the study was collected from informal interviews with Osoam community members in August 2014, and secondary data was gathered from a desk review of published literature, policy documents and research reports. The study applied a combined qualitative and quantitative approach, using Excel to calculate forest income and the SWOT (strengths, weaknesses, opportunities and threats) framework to assess opportunities and challenges. Based on the findings, the study offers recommendations for way forward strategies.

Osoam community forestry group is located in Sala Visai village, Sala Visai commune, Prasat Balang district (Figure 4), about 37 km from Kampong Thom and 168 km from Phnom Penh (Ma 2014). Established in 2004 on 308 hectares, the main objective of this community forestry project is to encourage local people to conserve and protect the forest and to use forest resources sustainably.

In 2008, 354 households comprising 1818 people (918 females) were living in Sala Visai village (NIS 2010). At the time of study, 273 families were involved in the community forestry project; most of them belong to the Kuoy ethnic minority. Besides growing rice and other crops, they collect NTFP such as rattan, bamboo, honey, fruits, mushrooms and medicinal plants; some run small shops and others are labourers (Ma 2014). In principle, only community forestry members are allowed to collect resources from the community forest.

Figure 4: Osoam community forestry area



Source: FA 2014: Osoam Community Forestry boundary

Contributions of community forestry to forest conservation and household incomes

Effects of forest restoration and conservation activities

In 2014, as part of their forest management plan, Osoam forestry community planted 15 hectares set aside as a protected area with bamboo and 9810 trees of five varieties: *korki* (Hopea odorata), *thnong* (Pterocarpus macrocarpus Kurz), *korkoh* (Sindora cochinchinensis H. Baill), *pdau* (Calamus sp.) and *pring*. In addition, they planted restoration areas with 7810 trees including 2000 acacias (Acacia auriculiformis Muell). The Forestry Administration has helped to train the committee members in regeneration methods such as tending, thinning and harvesting regimes. But more technical training is needed to raise other members' awareness of best practice and ensure they have the skills to apply these techniques.

Illegal logging and poaching have been reduced to very low rates since community members started patrolling the forest to protect it from illegal clearing. Community forestry and Forestry Administration signs and logos located throughout the forest make it clear that Osoam community has ownership rights over the forest and the resources within it.

Project proponents believe that, along with forests in protected areas, community forests will be the last largely intact forests left standing in Cambodia, like islands amid a deforested landscape. Community members felt that outsiders would eventually invade their forest, putting further pressure on the forest and the need to protect it.

Benefits derived from participating in community forestry

The direct tangible benefits to the households involved in Osoam community forestry project are access to and use of the forest to collect various NTFP, mainly fuelwood, mushrooms, fruits, rattan, honey, edible insects including spiders/tarantulas (*aping*) and fish, and a share of the takings from tree nursery sales and donations from visitors to Osoam Community Centre (Table 3).

The value of the annual cash NTFP income is substantial. In particular, the forest holds great potential for the production of natural honey. The community collects and supplies between 500 and 700 litres of pure forest honey a year for sale at USD5 per litre, worth up to USD3500. However, the honey is sold at a price set by intermediaries below the market price. Although community members recognise the problems and opportunities, they lack financial and technical support to develop their honey business.

Forest foods are another benefit and nutritionally important, providing a year-round source of food and fodder. Fish caught in the Osoam stream, which flows through the forest into Prey Pros River and finally the Tonle Sap Lake, is the main natural food source. The stream contains some big fish such as *trey chhdor* (Channa micropeltes)—the giant

Table 3: Resource collection in Osoam community forest, 2014

Resource type	Collection season	Beneficiary households	
		No.	% of total
Income from NTFP			
Fish	May to Jun, and Sep to Oct	273	100
Fuelwood collection	Daily	273	100
Fodder	End of Dec to Apr	190	70
Wild mushrooms	Mar and May, and Sep after heavy rains	191	70
Edible wild fruits (*phlaekuy*)	Mar and Apr	82	30
Rattan (for furniture making and basket weaving)	Jan, Feb and Sep	38	14
Honey	Apr to Sep	44	16
Spiders/tarantulas (*aping*)	Aug to Sep	10	3.7
Revenue from the tree nursery and community fund			
Selling tree seedlings	Occasionally throughout the year	Used to maintain and run the community forest	
Community fund	Small amounts of money from visitors throughout the year	Used to maintain and run the community forest	

Source: Interviews with members of Osoam Community Forestry group, August 2014

snakehead or mudfish, capable of growing to 1.3 m in length and 20 kg in weight.

Almost all of the community members fish occasionally during the fishing seasons in May to June and September to October. Besides home consumption, households can generate cash income of around 400,000 riels (USD100) per season from selling fish. The biggest difficulty with managing subsistence fishing, however, is that is difficult to monitor, yield is variable and overfishing a concern. Without the ability to estimate how many fish there are, it is almost impossible to determine how many can be caught while sustaining a viable fish population. The absence of scientific data or catch records to estimate the stock of different fish species stresses the need for strong science-based assessments to assure future sustainability. That said, if the forest disappears, the fish will disappear too.

Edible forest products such as mushrooms, fruits and insects are also significant sources of food and cash income. Wild mushrooms (mostly acacia and vine mushrooms) appear following heavy rains usually in March, May and September.

With support from the project fund, the tree nursery produces native trees and shrubs from local seed and sells some of the seedlings, mainly to NGOs and the Forestry Administration. The nursery sold around 8000 seedlings in 2011, 5000 in 2012 and 2000 in 2014. The species grown are mostly *krayoung* (Dalbergia cochinchinensis Pierre) and beng (Afzelia xylocarpa Kurz. Craib).

Outcomes of a SWOT analysis

Table 4 summarises the particular strengths, weaknesses, opportunities and threats (SWOT) facing Osoam community forestry group. The options and problems identified by the SWOT analysis can be used to determine strategies for a way forward for Osoam forest users group. The following set of actions should be considered:

- Secure land tenure and rights
  - o Obtain official approval from MAFF.
  - o Secure willing cooperation through maintaining good communication and building strong working relationships with local authorities and Forestry Administration to keep the community safe.
- Secure financial support
  - o Build capacity for community-based NTFP enterprise (e.g. forest honey) including sustainable harvesting, processing, marketing,

Table 4: SWOT analysis of Osoam community forestry project

Strengths	Weaknesses
Community forest boundary is clearly demarcated (supported by APFnet) The community has its own rules and regulatory capacity, and official legal status Through training, knowledge is transmitted within the community on silviculture best practices: seed treatment, germination, soil blending and forest thinning Integration of local ecological knowledge and scientific research: monitoring and recording forest dynamics in a observation plot Routine forest patrols have almost eliminated illegal logging and poaching Tree nursery produces native trees and shrubs and sells seedlings to NGOs and the Forestry Administration Forest areas set aside for conservation and forest restoration Cooperative relationships and coordination between Forestry Administration and local community keep the community safe Community members keep NTFP use within the limits of forest regeneration and natural growth, and respect rules about not collecting wood in conservation areas	Official declaration/approval from MAFF lagging Financial constraints after the project ends Limited knowledge and expertise on sustainable forest management, particularly tree breeding and forest ecosystem restoration Inactive group leader Weak institutions affect the quality of governance Not all members participate fully in community forestry activities NTFP values are set by intermediaries below market prices No market chain for unique forest products
Opportunities	**Threats**
Forest foods, especially honey, fish, wild fruits and mushrooms, have great potential in niche markets and thus for more diverse sources of income. Revenues from tree nursery, ecotourism and study tours help to maintain the community forest	Insecure land tenure and rights Fear of "outsiders" encroaching on community forestland

product development and value-addition; revenues from selling honey and other forest products would help to support community activities.
  - o Forestry Administration or other stakeholders should help the community to set up a website to market their products, raise public awareness and spread information about community forestry via social media.
  - o Build the capacity of the group leader and committee members to fill the management vacuum in community forestry management, governance and fund raising.
  - o Establish a community savings group by reinvesting revenues from the visitors centre, tree nursery and other income sources.
- Strengthen the community's capacity for sustainable forest management
  - o Train community members on keeping the forest inventory (systematic collection of data and forest information for assessment) so that they are able to continue the study themselves.
  - o Improve local capacity to run the tree nursery, particularly in breeding and propagating trees and bamboo to produce better quality tree seedlings and plants for retail and replanting in the community forest.
  - o Keep the management committee fresh, focussed an effective by holding regular elections.
  - o Provide government incentives to encourage graduate students and technical officials to help and work directly with the community in restoring and conserving their forest.

Discussion and conclusion

Community forestry sites occur in specific settings in the landscape and support specific plant and wildlife communities, with successes and failures largely determined by local ecological, social and economic conditions. Even so, three crucial factors stand out for their roles in successful community forestry: well-defined property rights, effective institutional arrangements, and community interests and incentives (Pagdee, Kim and Daugherty 2006). Without these elements, it will be very difficult to secure the survival of natural forests and the well-being of forest-dependent communities.

In Cambodia, weak institutions and poor governance are at the root of widespread land disputes. Even land allocated for community forestry is not safe from land-grabbing and commercial exploitation. Ineffective law enforcement makes it almost impossible for community forestry groups to assert their rights of ownership especially against powerful, self-interested adversaries. This emphasises the need to support sustainable forest management through instituting clearly defined property rights and building the capacity of local institutions (Clements et al. 2010). In addition, monitoring and evaluation of community forestry activities is required to find out what has worked and what has not (Sokh and Iida 2001)

Community forestry is increasingly being recognised for its social, economic and ecological importance, and more community forestry groups are being set up. However, as the case study of Osoam community forestry reveals, the critical issues of insecure land tenure, disorganised local institutions and insufficient technical and financial support risk undermining the overall aim of achieving sustainable forest management and poverty reduction.

Challenges aside, community forestry development in Cambodia offers a sustainable and viable approach to the protection, management and use of natural resources in forests that occur outside protected areas. If well executed, community forestry can play an important part in conserving ecosystems and biodiversity, meeting food security and livelihood needs and improving the welfare of local communities. Cultural, aesthetic, educational and scientific considerations also provide sound reasons for scaling up support to communities interested in owning and managing forestland.

In short, greater attention paid to community forestry invests in environmental capital in a way that is consistent with future as well as present needs. To fully realise that potential, and key to the goal of self-sustaining forest management, close collaboration between national forestry institutions, local government authorities and forest communities should be encouraged, especially in defining a clear land tenure system, building strong and stable institutions, and securing continuous financial and technical support.

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