Research article

Payment for Environmental Services (PES): Case Study on Conservation Agreement on Forest and Biodiversity Conservation in Central Cardamom Protected Forest, Thmar Baing District, Koh Kong Province

LYNA KHAN*
Royal University of Agriculture, Phnom Penh, Cambodia
Email: khanlyna@gmail.com

Received 19 December 2011 Accepted 7 February 2012 (*: Corresponding Author)

Abstract Cardamom mountain of Cambodia was classified as *Burma's hotspot* of biodiversity by UNESCO in 2006. It includes watershed, air filtering and many other natural resources such as timber and non-timber forest products (NTFPs), food, medicine and construction materials. Forest has been severely degraded by chronic war and over exploitation of wood by concession companies. Conservation International (CI) has collaborated with Royal Government of Cambodia (RGC) to reform forestry laws and establish the Central Cardamom Protected Forest. Payment for Environmental Services (PES), which is an effective concept for biodiversity conservation. The *win-win* approach of PES mechanism provides benefit to all villagers in return for sustainable conservation. For this reason, an overall goal of the research is to compare Conservation Agreement (CA) features and mechanisms of CI to those of PES. This research intends to describe CA mechanism through PES periscope, analyze institutional design and explain institutional arrangement as well as to indicate factors inducing changes in resident behaviour. This study was conducted inside and around the protected zone of Central Cardamom Protected Forest (CCPF) and it covers three communes of the district. Interviews were conducted on site with the participation of 59 people, including farmers, authorities and NGOs in the study area. Besides, states and NGO officers involved in this research were informally interviewed. The results of this study showed that CA as a mechanism is similar to PES, but it is not just PES due to its features. Although there are many features similar to PES mechanism, it is totally a not voluntary transaction because villagers live in state forests, so they don't have a legal land title. They don't have a right to manage the state forests which are controlled by forestry laws. On the other hand, CA design lacks institutional interaction between involved institutions so it is not legally recognized. All changes in local behaviours may be caused by the restriction imposed by the forestry laws and aids for community development that stop land encroachment. Conservation Agreement enhances the community development and alleviates poverty of local settlers inside and around CCPF by providing development training and incentives such as establishing microcredit, NTFPs processing and providing agriculture instruments. Overall Conservation Agreement is not pure PES but has affected participatory conservation and poverty alleviation.

Keywords: PES, conservation, incentive, conservation agreement, voluntary

INTRODUCTION

Ecosystem sustains human life by providing food and drinking water, maintaining stock of continuously evolving genetic resources, preserving and regenerating soils, fixing nitrogen and carbon, recycling nutrients, controlling floods, filtering pollutants, pollinating crops and more other services. The ecosystem is facing severe degradation caused by human activities in agriculture expansion (FAO, 2007a). Ecosystem degradation in Cambodia is also severe due to over exploitation of timber by concession companies after civil war (USAID, 2001). Cardamom

Mountain was defined as Indo-Burma biodiversity hotspot by UNESCO in 2006 which consists of hundreds of endangered plant and wildlife species. Many NGOs and state agencies which are working in biodiversity conservation are concerned about biodiversity and ecosystem degradation in Cardamom Mountains (CI, 2009). Within this wide context, Conservation International (CI) Cambodia has initiated the Conservation Agreement (CA) by paying for contribution to natural sustainability in Cardamom Mountain area through formation of PES due to its framework and features. Within this framework, a market-based mechanism, at least one service buyer, who is the beneficiary, pays for environmental services to ecosystem service providers under conditions specified in a contract facilitated by intermediate agents or intermediate buyers who are found as states in many implements of PES in other countries of the world. Due to Forestry Reform since 2002, institutional arrangement and its interaction have contributed to accelerate CA and promote it into a national level to be recognized by the states (CI, 2009). In addition, benefits from incentives l helped to make large changes in land use practices and made the living of people better. This research has made an overall attempt to define and explain the importance of institutions and their institutional interactions in the design and performance of PES (Wunder, 2005) within three main objectives: 1) To describe the CCPF Conservation agreements mechanism through the PES (indirect). 2) To analyse the institutional design and explain the current institutional arrangement (process of elaboration, factors explaining the current framework). 3) To identify the factors that induce changes by the practices of CAs on people (development) and on natural resources (conservation).

METHODOLOGY

Study Area: Selection of the study area was made after an exploratory trip in three communes (Thmar Dan Pouv, Russei Chrum and Tatai Leu). This study has been carried out within the scope, objectives and availability of time for investigating the most crucial part of informative data obtained from the target area in response to the main goal of this research.

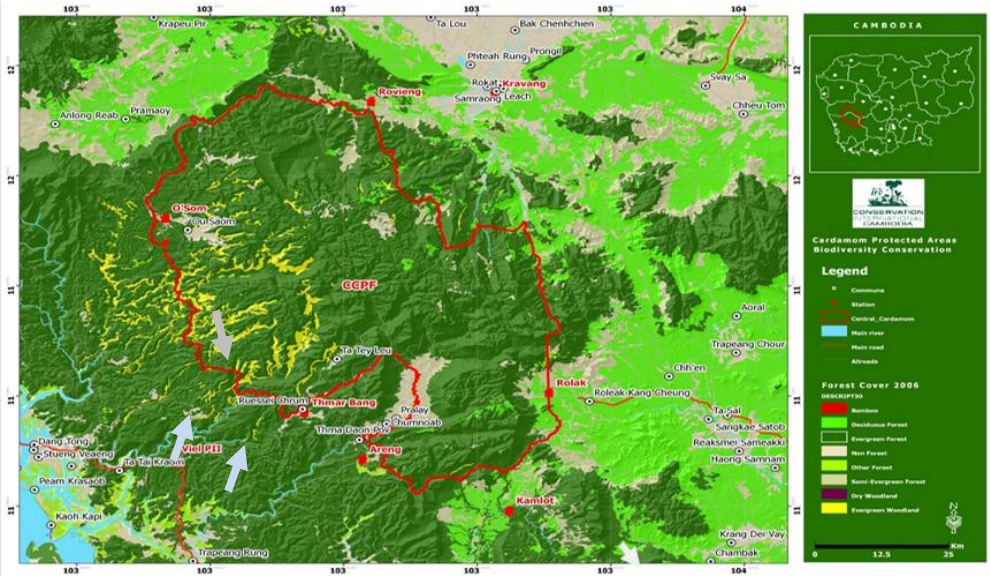

Fig. 1 Map of study areas in CCPT
Source: CI (2009)

The study area covers three communes inside the buffer zone of Central Cardamom Forest Protected, Thmar Baing district, Koh Kong Province. The three communes were chosen as the target area according to the implementation of CI's Conservation Agreement, which is the core of the present research objective and geographical and social diversity. The research areas are briefly shown in Fig. 1 above.

The red line indicates boundary of CCPF which is classified as state forest and controlled by FA in cooperation with CI. There are two target located outside the CCPF boundary and one located inside the protected zone.

Sampling size and methods: The number of interviewees was defined based on real situation of exploratory trip. Stratified sampling method was used as principle to define the number of interviewees, and then classified according to their involvement in social activities and knowledge of Conservation Agreements. Commune chiefs met and were informed of the present research in their commune boundaries and the objectives of the survey, and were asked for general information regarding the commune and villages (demographic, social, and economic data). A random sampling method for villagers was chosen due to the impossibility of preliminary stratification according to a set of criteria. However, as long as we got to know the villagers in the area, we tried to stratify the interviewees according to:

- **Age criteria** – Farmers actively engaged in social life, agricultural practices, and active household members in age groups of 20-40, 40-75
- **Period of stay in the commune** – Villagers living in the community for a sufficiently long time, both indigenous (born in the area) or migrants, as they were involved in the key events;
- **Occupation criteria** - Resident teachers, village/commune policeman, among other activities, as they are important beneficiaries according to the Conservation agreements. The design of sample size has been changed several times to be flexible to the real situations on field and available to villagers and other interview targets.

Eventually, 44 households, 8 community committee members and 7 commune councils or commune chiefs have been interviewed as shown in Table 1.

Table 1 Number of ground respondents of research interview

Commune name	Total interviews	Villagers	Village and commune chiefs and/ or members of their council	Natural resource management community committee members
Thmar Danpouv	27	21	3	3
Tatey Leu	19	13	3	3
Russey Chrum	13	10	1	2
Total	59	44	7	8

Besides on site interviews, many other states and NGOs officers involved in conservation of the research area were interviewed to understand their views about agreement and to look for an alternative approach in biodiversity conservation.

RESULTS

After many months of field study, results answer to objectives of this research in the study area. The conservation agreement of CI has been designed with its own nature and criteria and then implemented by local people inside and around Central Cardamom Protected Forest. These results also express the institutional arrangement and its interaction in the context of conservation agreement as well as the comparison to the mechanism of PES. Finally, factors that induced changes within and around the implementation of CA are also highlighted to elaborate the right response to real local needs of community and help them get better off as well as to motivate them to be voluntarily involved in biodiversity conservation.

Design of Conservation Agreement

Conservation Agreement is a new approach of community engagement implemented by Conservation International in order to earn trust and engage local people living in and around the CCPF in forest and wildlife conservation in a sustainable way, with balance between development and conservation. The logic scheme of CA in Fig. 2 shows the typical logic of conservation agreement implemented by Conservation International in Cambodia at grassroots level and in assisting the ministry of agriculture forestry and fishery (MAFF) and Forestry Administration (FA) in CCPF management plans.

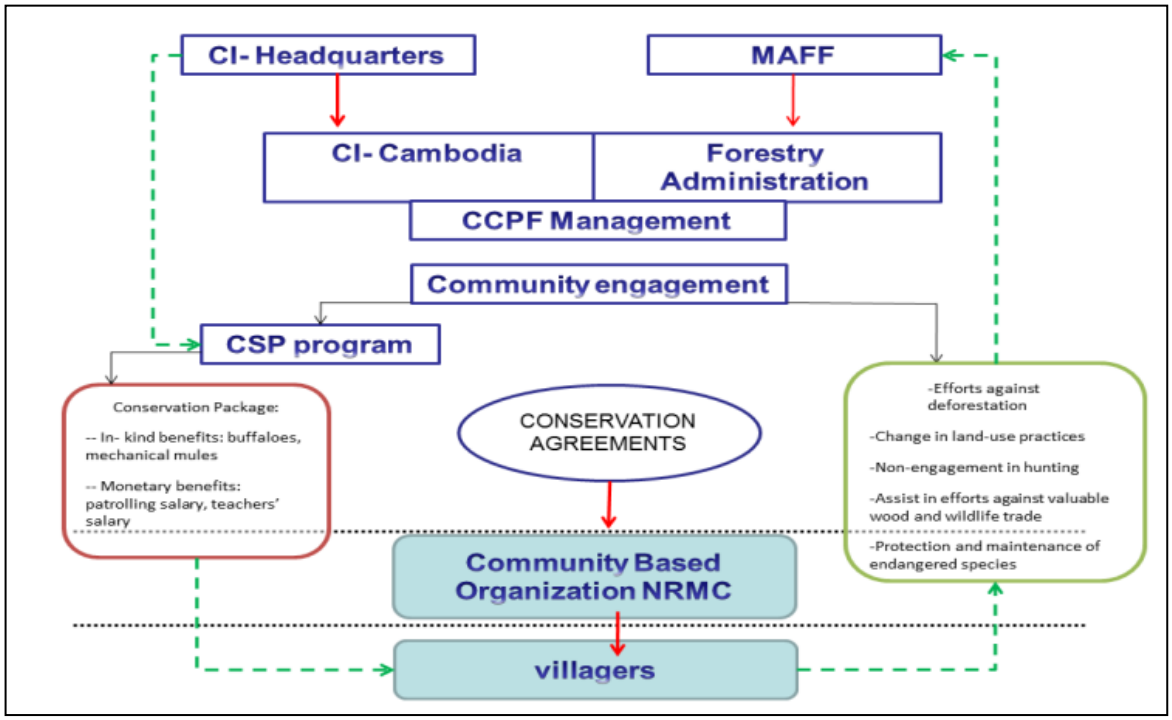

Fig. 2 Logic scheme design of agreement

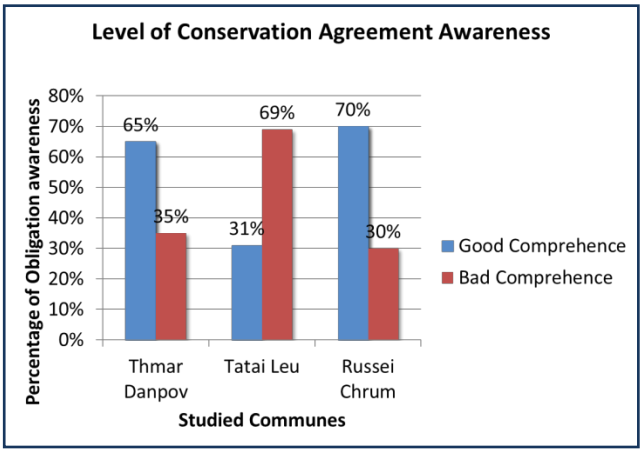

Fig. 3 Level of Awareness in obligation and benefit of CA

This logic framework of Conservation Agreement make local community cooperate within *conditionality* in conservation for incentives. It makes them cultivate in a fix land and end shifting agriculture which is similar to *conditionality and additionality in PES* (Muradian, Corbera, Pascual, Kosoy, and May, 2009). In contrast, the majority of villagers seem to have very low competence on obligation and responsibility of CA because most of them have not clearly distinguished between CA and forestry laws. Fig. 3 above shows the level of understanding in regulation and benefits of CA.

Institutional design and interaction of conservation agreement

The institutional arrangement in an agreement context indicates that implementation of CA was initiated at grassroots level and quickly spread from commune to commune. The study found that the organization of this agreement has a good design at grassroots levels, where all local needs and suggestion have clearly been recognized. However, it has never been implemented at a national level due to the lack of technical works establishing cooperation between involved institutions, identifying land use planning mapping, legal principles and so on. According to the results of interviews, involving stake holders on CA with local authorities, CI, FA and MoE show that there is no clear legislation document supporting participatory land use planning (PLUP) of CA. On the contrary, most of the villagers expect the so-called PLUP made by CI to be a legal process of land entitlement. The interviewing of local villagers shows low level of understanding around all the institutional design of CA. Another cause of poor design on conservation process could be institutional interaction between involved stakeholders.

Conservation opportunity cost and distribution:

Opportunity cost was established firstly on forest land conservation. Villagers promised to stop land encroachment in return for some amount of money for commune development. Formula of opportunity cost was made absolutely by CI. The calculating formula for forest opportunity cost is **OCF = FL x ARy x MP** (**OCF**: Opportunity cost for forest, **FL**: Size of forest encroachment per year (ha), **ARy:** Annual rice/crops yield from FL (Kg/ha), **MP**: crops market price ($/kg))**.** New forms of conservations have been expanded every year after the end of CA contract which was made annually. The benefits provided by agreements can be divided into 2 categories: Conservation package- a monetary sum that reflects the opportunity cost of the foregone activities such as forest clearing for farming activities, wildlife hunting and trading; Conservation Agreement Management and Monitoring costs- such as patrolling salary, administrative salary for NRMC committee, patrolling equipment and first aid kits and individual incentives for confiscated snares and animals. Decisions on spending the Conservation Package are made jointly by CI's CE team and NRMC members in consultation with villagers. The main part of the Conservation Package benefits are provided in-kind, such as mechanical mules (hand tractors), spare parts (cart), etc.

DISCUSSION

This design of Conservation Agreements does not identify final ES beneficiaries. It is not a beneficiary- pay scheme. NGO stands as a donor- buyer, local populations as ES providers.

Payments are conditional to the performance of the obligations rather than to the provision of ES. The conditionality criterion is weakly enforced and sacrificed to maintaining good relations with local communities - working with people is more important, than applying the contracts to the letter. The survey with local people showed that they have realized that they were living in states forest controlled by FA. Most of them experienced many huge conflicts with FA law enforcement team over the past years. They are obligated to respect the forest law against land encroachment and wild life hunting and trading. Most of the villagers still confuse CI and FA officers.

The additional value of CA's has not been prioritized. Baselines on forest cover and wildlife populations do not exist. CI acknowledged this weak point of the program and is to launch flagship species' population monitoring programs. The data on net increase of the forest cover or a

flagship species population could be obtained from other sources, but these evolutions can't be considered as agreement-contingent.

Agreements are not truly voluntary and seen as another beneficial NGO intervention. Local populations don't have legal rights on the land and resource use, their rights are restricted by law and any intervention providing additional benefits is a priori welcome. The principle of "voluntariness" is ambiguously perceived: so most of the interviewees accepted that the agreements are voluntary, which could be explained that it does not imply big changes in their livelihood strategies, that it is not "serious" enough, and that they don't care if it exists or not.

Opportunity costs are not based on market mechanism and represent amounts negotiated between CI and the community. They have been negotiated once and have not been changed.

Due to **The scale of "opportunities' loss" is yet small.** Relatively lower population in the uplands, difficult access to the area makes that the demand for land is less than in the lowlands of Cambodia. Indigenous populations don't perceive yet the land restrictions, thus land-use plans introduced by Conservation agreements.

Agreements - instruments of diplomatic conciliation in the battle for law enforcement. CI stays as a "conservation-oriented" organization and the primary objective is to enforce the protected zone management. Agreements in principle enforce the law, rather than represent the holistic voluntarily negotiated market transactions between resource beneficiaries and ES providers.

Field trips allowed understanding the local perception and revealing such problems as limited social activeness, limited awareness on quid-pro-quo mechanism (Wunder, 2005) of the agreements, unequal access to benefits, elite's capture, and governance issues specific to the Cambodian "patronage" systems. CI's Community Engagement actions on the field stay quite relevant in helping and to responding to the imminent development needs. Their initial design as of a strong institution based on principles of civil society met limitation in the context. Nominally, CA's are based on a wide participatory approach, in practice for a successful implementation they have to be negotiated respecting strict hierarchical order of the Khmer local governance. In-kind benefits from CA's were intended to promote environmentally improved productive sustainable fixing agriculture. CE team worked with local communities to restore old paddy rice fields and gave mechanical mules and water buffaloes as means of plowing. This was with an aim to increase crops yields and support the livelihoods. Basically, only those who have rice fields could effectively use agriculture instrument, while others prefer traditional practices in their plots of land (planting without plowing, hand plowing hoes, abandoning land for a fallow period, shifting cultivation). Although it is not always possible, trend should be developed in supporting such activities as agro-forestry, ecotourism and developing local agricultural and NTFP markets. This would provide people with good sources of additional income and their livelihoods would rely less on subsistence agriculture and illegal activities. Few of environmental services provided are paid depend on forest environmental service, wildlife species protection and dragon fish protection. Rewards have been provided without any conditionality for conservation. For instance, conservation package provided on dragon fish conservation was made without real baseline study on the increasing number of dragon fish fingerling.

CONCLUSION

Overall, result and discussion have clearly distinguished CA agreement as PES based on its features and mechanism. Anyway, CA has provided a crucial lead to PES implementation in Cambodia in the future because it clearly contributes to poverty alleviation in context of development and biodiversity conservation through an approach of environmental economics, providing benefit for livelihood and community development through market-based mechanism. Establishing a legal PLUP is the most important lead for land entitle which is crucial component of PES in the future. Institutional interaction should be improved to provide a helpful process of establishing legal framework for natural resources conservation and community development.

ACKNOWLEDGEMENTS

This research project was jointly conducted by Faculty of Agriculture Economic and Rural Development (FAERD) a subset of Royal University of Agriculture (RUA) on project "Definition of Environmental Services Provided by Cambodian Agriculture in form of Payments". RUA, as well as the GIDAR Master Program was supported by the FSP project funded by the French Government and the RUA. As well, we would thank to all partners who cooperated with the research.

REFERENCES

CI. 2009. The management plan of Central Cardamom protected forest for watershed protection and biodiversity conservation 2010-2014. Phnom Penh Conservation International Cambodia.

FAO. 2007. The State of Food and Agriculture: Paying farmers for environmental services Vol. 38.

Muradian, R., Corbera, E., Pascual, U., Kosoy, N., and May, P.H. 2009. Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services. Ecological Economics. Elsevier.

USAID. 2001. Cambodia Environmental Review: Status and Trends in Environmental Management and Options for Future Action. Vermont 05401.

Wunder, S. 2005. Payment for Environmental Service: Somes nuts and bolts Vol. 42. Jakarta: Center for International Forestry Research (CIFOR), Indonesia.