Potentials in applying payments for ecosystem services approach of biodiversity conservation in Sri Lanka

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Introduction

The lack of financial support has become a barrier in order to implement conservation strategies in developing countries. The economic recognition of ecosystems services such as provisioning of food, providing clean air, water, recycling minerals, pollinating, climate regulation are therefore important because it directly affected to well-being of human. The identification of these services provide a path to design and make efforts to add monetary value through Payments for Ecosystem Services (PES). PES identified as a transaction between the service provider and the at least one buyer of particular ecosystem service (Wunder, 2005). The applications of PES differ from the traditional conservation approach and it is a novel concept to Sri Lanka. PES has widely implemented as an alternative financial mechanism in the developed countries. Sri Lanka's natural resources are becoming highly threaten and creating scarcity due to over exploitation, urbanization and deforestation. PES can be used to internalize the ecosystem services in order to value previously unpriced ecosystem services such as carbon storage, natural water purification, climate regulation, provision of habitats for wildlife. According to literature there are three main PES schemes, *internationally*; Reducing Emissions from Deforestation and Forest Degradation (REDD+) whereas developing countries willing to reduce emissions from deforestation and degradation, *nationally*; farmers in food industry paid for sustainable farming practice and payments for watershed management, community forest management, *locally*; residents are paid for contributing to manage landscape and agriculture value in their home gardens and cultivations. Efficient and different land management can influence on benefits that ecosystems delivery to the community because it has recognized that people orientated conservation is more effective way in protecting the environment. In developing countries the demand for fresh water and lands can be increased day by day with the increasing population and industrialization. Thus, resulting a gap between demand and supply (Pant & Rasul, 2013). While Sri Lanka is rich in

biodiversity and mainly depend on agricultural based income, appropriate PES schemes can generate more benefits to well identified buyers and sellers. Most of environmental services in Sri Lanka are still treated as externalities, they are not wide spread among the beneficiaries. If those can be internalized through payments to the resource holders by beneficial parties, it can create incentives towards the protection of natural ecosystems while generating required financing for conserving natural ecosystems. This study attempts to explore the potential of applying PES to a developing country like Sri Lanka and possible approaches to implement this as supportive alternate financial mechanism for local livelihood and also to generate income source to biodiversity conservation.

Methodology

PES has potential to generate multiple benefits by enhancement of one ecosystem service (Rubinoff & Randrianarisoa, 2009). It needs to ensure long-term conservation of our natural forests and there is the challenge of finding ways to financially support conservation, regulation, forest management, and forest protection. This description therefore reviews existing methodologies and available information to value biodiversity and identify possible payments for ecosystem services. PES can be used to conserve the watershed and natural forests in developing country like Sri Lanka. The use value of consumers can be applied to measure the economic value of water (Pant & Rasul, 2013). The existing value of payment for the water provisioning and how much they willing to pay for additional continuous supply from conserving upstream catchment without converting into a farmland will represent the economic value generated from conservation. It can be used as the payment for conserve the catchment while beneficiaries passing to the downstream population. The another method that as literature suggests is the city water tax can be used as a hydrological payment for conservation and reforestation activities in the mountainous region and the protected areas that supply drinking water to the downstream urban populations. The private stakeholders such as urban consumers, hydropower generation companies, agricultural and private organizations rely on clean water supply from local watersheds and lead to the pollution of natural water ways. Taxes from those parties can then be used to support forest conservation activities. Another ecosystem service of forests is an increasing interest that of carbon sequestration. REDD+ is one such approach where internationally encourage forest conservation or restoration aiming to withstand climate change in developing countries by offering financial compensation. Such compensation schemes can be directly used as a source of financial support to biodiversity conservation approaches. There is a gap between the PES implementation and the identifying actual services. Because of the difficulty of measuring the

ecosystem services as it is (Alix-garcia & Wolff, 2014). According to the literature study there are toolkits to value particular site to answer this question. The Toolkit for Ecosystem Service Site-based Assessment (TESSA) provides guidance on low-cost method for evaluating benefit generation for people from a natural environment such as rainforest. This method can be practiced as a rapid assessment of ecosystem services many users (Peh et al., 2013). The tools are applicable especially to developing countries across different habitats ranging from terrestrial to aquatic. This tool kit provides methods for assessing global climate regulation; by carbon sequestration, water provision, water quality improvement, harvested non-timber products, and cultural value. It needs to value a particular ecosystem before assigning payments mechanism. Therefore, this kind toolkit is more applicable for countries like us. UNDP has identified many criteria including geographical boundaries, service providers and buyers, well defined market, baseline data as the process of establishing PES scheme. There are lots of methods for creating markets to practice PES. As a public payment schemes; giving conservation priority to preserve ecosystem services according to government by declaring protected areas and facilitate the conservation. The relevant authorities can do payments to maintain the ecosystem services provided. The nature-based recreation, such as tourist fees for protected areas can directly use for the biodiversity conservation. The gain from such benefits will secure the long term conservation practice within the country.

Results and discussion
Based on literature this review explore the potential of implementing PES as an alternative financial mechanism. In biodiversity Strategic Action Plan of Sri Lanka 2016-2022 suggest that by 2022, the valuation of biodiversity is mainstreamed. Also it has identified the need of innovative financing mechanisms to fill the gaps of financial mechanism such as PES. It is difficult to monetize biodiversity and related components because existing markets fail to value it properly. PES schemes will lead to address this market failure by providing financial incentives and other types of reward to service providers. What are the need of spatial and temporal scales of the PES schemes? How will be benefits assessed over time? The following PES schemes should address the "polluter and the beneficiary pays principle", compensating individuals or communities. Community Forestry Management has implemented in 2003 as a method of sustainable management of forest resources to reduce deforestation and improve household livelihoods by promoting agro-forestry (Dangal & De Silva, 1999). With relevance to PES, it provides farmers with property rights and create an important step in encouraging for reforestation and sustainable land management and also prevent illegal encroachment. With some

advancement this kind of programs can be implemented to value such forests ecosystems. But the entire value of services provided by all catchments in a particular area cannot be expressed as a monetary value. Then there is a question left behind, who will be going to pay for these services? We don't need to relay on foreign finance but can create a mechanism to generate resources within itself with the help of PES schemes. Therefore PES can create incentives for authorities to take the value of ecosystem services into account in making decisions. Lack of awareness among beneficiaries and service providers, ecosystem valuation, Lack of expertise, lags of time, free riding and excludability can be considered as constraints of implementing PES schemes (Thomson & Richardson, 2011)

Conclusion

There are many ways in which biodiversity conservation can be supported by ecosystem services approaches such as proper decision-making; adding new value to protected areas; and the sustainable management of ecosystems outside of protected areas (Ingram et al., 2012). The value of natural capital and ecosystem services may not easily traceable whatever the method used to quantify. As ecosystem and natural resources scare in future its value get increase. It will be difficult to assign a presise value for ecosystem service. As a developing country we need to move forward with PES as an alternative financial support for the development of the local community and our natural resources are becoming scares due to overexploitation, population growth and land conversion. Thus PES can play a role as a non- traditional and innovative alternative financial mechanism to achieve successful conservation goals and also it will become an incentive towards biodiversity conservation within the country.

Keywords: *Biodiversity, conservation, financing, payments for ecosystem services.*

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