

Potential role of Payment for Ecosystem Services (PES) in climate change adaptation of Least Developed Countries: A case from Nepal

Phurba Sherpa-The Partners Nepal (TPN)

Abstract

Least Developed Countries (LDCs) are highly vulnerable to the impacts of climate change although lack necessary institutional and financial capacity to cope with these impacts. They are highly dependent on external aids in responding most of such impacts. Although relating Payment for Ecosystem Services (PES) with climate change adaptation plans is relatively new idea, this could provide some beneficial inputs to the climate change adaptation in LDCs like such as Nepal supporting adaptive capacity. This paper seeks the potential ways of integrating PES and climate change adaptation.

Introduction

Nepal is geographically extreme region. Because of high sensitivity of the mountain environment, even a small change in climate can have huge impact on the environment affecting the livelihood of population and development activities (Republica, 2009a). The issues related to governance of climate change financing and promoting adaptation in Nepal is one of the most prominent issues. There are several global issues but issues related to fixing operational modality at national and local level is more urgent and important (Regmi and Bhandari, 2012). For this, policy makers and development agencies are keenly researching on the different sets of relevant information and evidences that can show the effectiveness of approaches and mechanisms of implementing and facilitating climate change governance practically (Regmi and Bhandari, 2012).

Stern (2007) has pointed that climate change has become one of the most critical global challenges and several scientific evidences have clearly indicated climate change as a serious and urgent issue. Impacts of climate change in countries or region those are highly fragile and have very low adaptive capacities are even more severe. Adger (2006) has defined vulnerability as the susceptibility of exposure to harmful stresses and the ability to respond to these stresses. The main reason for higher vulnerability to climate change in many developing countries is poverty and limited economic capacities (Barbier et. al, 2009) including the weak policy and governance. The impact of climate change is even more severe in the context of mountainous developing countries like Nepal where major economic activities have direct dependence on natural resources (water, forest, mountains etc.). According to Mertz et al (2009), international attention towards the adaptation to climate change has increased as the sureness of climate change projections is getting higher and this has been addressed more extensively and has been given more importance in the fourth assessment report of IPCC. Developing countries have specific needs for adaptation towards climate change vulnerabilities and the huge part of global costs of climate change will be carried by them. These poor developing countries however have limited financial resources, infrastructure and technologies which are not sufficient to adapt to the abrupt changes.

Nepal holds huge potential of delivering ecosystem services which are delivered from the natural ecosystem and its landscape. 35% of Nepal's overall GDP has been contributed by forest, fishery and agricultural activities (NPC, 2007). These activities have been delivering all four types of environmental services i.e.

Provisional, Regulating, Cultural and Supporting Services (Subedi, 2006). The sharp gradient of the landscape has facilitated the current of the water systems in the rivers which have potentiality of generating hydroelectricity. Although Nepal's theoretical potential of generating electricity is 83,000 Mega Watt but only approximately 700 Mega Watt of electricity is being generated (Energylopedia, 2015). The forest resources of Nepal hold huge opportunity to provide the rural pro-poor communities with the incentives in terms of both provisional and regulatory services. There are several other environmental services being generated and those holding huge potential to assist local community in supporting them to develop themselves socially, economically and environmentally (World Bank, 2007) but their proper utilization and bringing them to PES mechanism is yet questionable.

Payment for Ecosystem Services

Wunder (2005) has defined Payment for Ecosystem Services as, 'a voluntary transaction in which a well-defined environmental service (or land-use likely to secure that service) is being 'bought' by a (minimum of one) Ecosystem Service buyer from a (minimum of one) Ecosystem Service provider if and only if the provider continues to supply that service (conditionality)'. According to Kunwar (2008), all the services provided by the ecosystem or environment such as hydrological services, biodiversity services, recreational services, carbon sequestration, landscape or scenic beauty are the environmental services and their valuation largely depend on the assumption that the organization or individuals are willing to pay for environmental gains or their will to accept the compensation for the environmental losses. Under PES, the providers of environmental services receive direct payments for improving the provision of indirect environmental services from the users of these services. There are mainly four types of PES which are currently in practice which include, carbon sequestration and storage, biodiversity protection, watershed protection and landscape beauty (Wunder, 2005). Under carbon sequestration, local forest communities are paid for planting and maintaining forest by hydropower companies; local people residing close to the particular biodiversity are paid for their conservation approaches to create biological corridor by conservation donors; upstream residents are paid by downstream water users to limit deforestation, erosion, and flooding risk for protecting the watershed; and local people are paid by tourism operators not to do deforestation or kill wild animals being used for tourist for wildlife viewing to enhance the landscape beauty.

Climate change adaptation

According to IPCC TAR (2001 a), adaptation to climate change is to adjust natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Globally, adaptation to climate change is relatively a new concept which has not been taken into account in the arena of climate change for several years as attention was paid more to the mitigation (Burton et al. 2002). Mertz et al (2009) pointed that adaptation to climate change was not covered extensively until the fourth assessment report of IPCC (2007). In the fourth assessment report it has been covered more extensively and given an important place. As mentioned by Halsnaes and Traerup (2009), a new process has been developing to see climate change as one of the mainstreaming issues which mean that vulnerabilities and adaptation strategies are linked with the development of poverty reduction strategies. In most of the developing countries, this process of mainstreaming climate change adaptation has been donor driven as these countries do not consider climate change as their greatest challenges (Mertz et. al, 2009). Immediate needs for economic growth and poverty reduction takes highest priority in these countries.

This is the reason that most of the poverty reduction strategy papers of many countries are neglecting environmental concerns such as climate change.

Discussion

Climate change adaptation is completely new concept in the context of least developed countries like Nepal (Sand, 2011). The impacts of climate change however are very high and rapid. There have been several approaches to reduce the vulnerability of climate change at government level and several international communities. As a result the National Adaptation Program for Action (NAPA) is developed to address climate change adaptation mainstreaming them to development programs. Similarly Local Adaptation Plan of Action (LAPA) and Community Adaptation Plan of Action (CAPA) have been developed to ease the adaptation approaches at local and community levels. Watts (2009) pointed that (NAPA) provides a clear guidance for implementing adaptation actions and for the disbursement of at least 80 per cent of adaptation funds on the implementation at the local level and LAPA framework aims to make the adaptation planning bottom-up inclusive, responsive and flexible process. LDCs like Nepal are excessively dependent on international support and foreign aids to implement adaptation activities. Although the movement towards climate change adaptation is positive, Nepal faces several challenges in climate change governance such as climate financing at local and national level. The reasons behind the challenge of climate change governance are both domestic and international.

According to Kunwar (2009), PES is relatively a new concept and burning issue in case of Nepal. It has been realized as pro-poor and equitable benefit sharing mechanism which enhances livelihoods, sustainable development, and improves the socio-economic condition. Wertz-Kanounnikoff et al. (2011) pointed that it is widely been discussed in the literatures about the potential of PES to be a cost-effective and equitable instrument. Sand (2011) has argued that there is high potential of achieving the greater integration between PES and climate change adaptation but has several challenges. According to Adger et al. (2004) adaptation to climate change means to reduce the vulnerability of climate change. Hence in order PES to make contribution to climate change, it should be able to reduce the vulnerability. PES and adaptation to climate change interact in three main ways (Sand, 2011). First is the provision of Environmental Service through PES which could reduce the vulnerability of the associated socioecological system and the various components associated with it. Then secondly, adaptive capacity of several components could be increased by PES by the methods in which it is implemented and designed. And thirdly, it could be used as an incentive mechanism for environmental service providers which will promote the specific adaptation measures to climate change. This however is only the theoretical integration of PES to climate change adaptation. In order to integrate PES with climate change in reality, the local to national governance issues related to implementation climate change adaptation and PES must be addressed. For this, there should be strong coordination among all the national and international organizations. According to Adger et al. (2005), the successful adaptation policy should fulfil the requirements such as effectiveness, efficiency, equity and legitimacy.

LDCs like Nepal are highly vulnerable to climate change because of several overlying reasons such as economy, geography, policy gaps, poor governance etc. Regmi and Bhandari (2012), argued that the major priorities of poor communities in developing countries are to alleviate the poverty and fulfil the basic needs where social and economic problems are massive and urgent. Countries like Nepal in this context are under the pressure of development priority on one hand and on the other, bearing the burden of environmental impacts such as climate change.

Hence there seems the urgent need to mainstream the activities of climate change adaptation into the development process (Regmi and Bhandari, 2012). Vivekananda (2010) pointed that climate change adaptation approaches in Nepal are particularly being affected by inappropriate interventions which have caused biggest risk to peace and security in communities and due to the weak governance. Most of the development plans in Nepal are prepared with top-down planning mechanism. But top-down planning in case of climate change fails to grasp micro-level vulnerabilities Vivekananda (2010).

In response to this the new LAPAs developed has addressed bottom-up planning process. Nepal bears huge potential especially from fast flowing rivers and forest resources to generate significant PES funding which indeed could be applied for the adaptation measures (Subedi, 2006). The mechanisms like REDD, REDD+, CDM and other carbon related financing mechanisms could bring a big financial resources to the huge rural population to enhance their technology, knowledge and capacity towards the adverse impacts of climate change (ICIMOD, 2010) especially to the local people holding community forests.

In the context of developing countries like Nepal, PES encounters several implementation barriers and challenges. Basically it is totally new concept to draw its significance for climate change adaptation in Nepal which is even more challenging. PES however is receiving a lot of attention in policy making and among the donors as a means that can promote sustainable natural resource management which will also provide vital environmental public goods. The governance challenges for implementation of PES for climate change adaptation are similar to the challenge the climate change adaptation itself is facing. This include the lack of sufficient climate data to establish the relationship between PES and climate change adaptation, insufficient awareness of PES at policy and implementation levels and most importantly the lack of legal framework and governance related to climate change. Despite of these challenges, several organizations in Nepal have started the implementation of PES mechanism though it is very difficult to find these PES done with the motive of climate change adaptation. According to Sand (2011) and FAO (2007b), PES is a mechanism that can assist in reducing the rural poverty and can enhance the adaptive capacity by developing skill, education, infrastructure etc. PES mechanisms in Nepal however have been recognized only as pro-poor and equitable benefit sharing mechanism (Kunwar, 2008). Some PES programs are already implemented or are in the process of implementation in Nepal but its importance for the climate change adaptation has either not been judged or been judged very less. There is crucial need of good policy and governance in order to bring PES as a successful mechanism for climate change adaptation.

In developing countries like Nepal, the environmental concerns like climate change could not get the higher priority although the nation as a whole is highly vulnerable to the climate change. Poverty alleviation and development being the highest priority of developing countries like Nepal, environmental concerns are always under the shade. Davidson and others (2003) have argued that despite the fact that poverty reduction as well as the achievement of millennium development goal largely depend on successful adaptation to climate change, climate change adaptation has not been given high priority. There exist high expectation of government and organizations for the environmental actions such as climate change adaptation from the international community and developed nations. Due to this, government and organizations seek support even for minor interventions which could have been done with own effort. This has increased high dependency of developing countries like Nepal which has chain effect of dependency. Improving programs like PES could reduce this dependency to the some extent.

Some of the broad programs like Reduced Emission from Deforestation and forest Degradation (REDD) and hydropower projects in Nepal could have significant contribution to the local communities in Nepal (Bushley and Pokhrel, 2011) in terms of climate change adaptation by providing necessary financial support to conduct them.

For using PES as a good contributor for climate change adaptation in the context of Nepal, firstly, the climate change adaptation policies should be addressed effectively. Furthermore, Nepal will not be able to implement an equitable, efficient and profitable PES programs such as REDD unless international policy making process could be influenced in its favour and could resolve more fundamental issues that is hindering effective governance particularly ambiguities that exist in the legal, policy and institutional frameworks; the discretion exercised by public officials at all levels; and resulting constraints on the civil, political and resource ownership rights of forest users (Bushley and Pokhrel, 2011).

Conclusion

Least developed countries like Nepal have very weak governance and policy regarding climate change adaptation. The existing policies on PES have been judged very less or have not been judged at all to see its potential role on climate change adaptation. LDCs highly depend on foreign assistance for any development interventions and especially for environmental issues such as climate change adaptation. Climate change already has been one of the greatest challenges for development and livelihood in Nepal. In this situation PES could be one of the potential mechanisms that can support the climate change adaptation particularly by reducing the vulnerability aiding required financial adaptive capacity. In this paper we discussed about the potential role of PES in poverty alleviation and climate change adaptation in context of poor and least developed countries like Nepal. It is observed that PES mechanism can be used to reduce the ecosystem vulnerability and vulnerability of the local communities residing around it. Hence PES mechanism if implemented in integration with other plans especially the local development plans can enhance the climate change adaptation. Further detailed research is seen necessary in order to know actual role of PES for climate change adaptation in Nepal and to know the best governance arrangement to implement it successfully.

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