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Incentives, Ecosystem and Communities: A Possible Incentive Mechanism for Mid Hills of Nepal

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Abstract:

Payment for Ecosystem Service (PES) is one of the instruments increasingly used and recognized as a tool to sustaining ecosystem services flow while contributing to local livelihoods of the resource dependent communities. It is described as a free market-based approach to conservation where ecosystem service consumer pays to the producers/managers. However, a ‘’true PES’’ based on free market is either difficult to establish, or hardly existed in practice. Several arguments resonance against purely market-based PES schemes that commoditize ecosystem or nature under neoliberalism and does not necessarily benefit the poor. Our study in the Hindu Kush Himalaya, thus suggests to shift from a purely market-based mechanism to incentive-based mechanism for ensuring long term benefits to local mountain communities by rewarding their efforts on managing and restoring the ecosystems. We also argue that the concept of PES, if well integrated into the policy instrument could effectively ensure continued supply of ecosystem goods and services in Nepal Himalaya.

Keywords: Payment for ecosystem services, incentive, market, policy instrument, livelihood

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1. Introduction

Nepal is rich on its biological and cultural diversity and harbors diverse ecosystems providing numerous goods and services to humankind (Karki et al. 2012). However, with pressing climatic and anthropogenic challenges, ecosystem health and its ability to supply goods and services are directly impacted, with negative impacts on community livelihoods. Therefore, there is a growing concern, both at community and policy decisions, to minimize ecosystem degradation for human well-being. Many scholars argued on multi-functionality ecosystem management in both programs and policies (Merlo and Briales, 2000; Wunder 2005; Cubbage et al. 2007; TEEB 2010). Similarly, the Millennium Ecosystem Assessment (MEA) provides a concrete basis for integrating ecosystem services into the policy agenda (Fisher et al. 2009).

The concept and ecosystem services approach are being widely adopted as a tool in decision making process, and Payment for Ecosystem Services (PES) concept is taken as possible tool to maximize ecosystem benefits. (Wunder, 2008; Engel et al. 2008; Bhatta et al. 2017; Boerner et al. 2017). , PES has globally emerged as an approach or instrument to sustainable ecosystem management supporting the rural livelihoods and contributing to the global agenda of poverty reduction (Hubermann 2009; Bhatta et al. 2014).

The concept of PES revolves around financial schemes that aim to conserve ecosystem services, by providing economic incentive to those who contribute to conservation of specific resources, mainly by managing the ecosystem services and by encouraging the protection and conservation of ecosystems (Khanal and Poudel, 2012). This concept was pioneered in Costa Rica, where a national payment scheme was set up in 1997 to maintain and enhance environmental service provision in forestry sector (Pagiola 2008). Wunder (2005) described PES as a voluntary mechanism of free market-based approach to conservation where ecosystem service consumer/buyer pay to the managers/seller following a set of five criteria, that includes- i) a voluntary transaction, where ii) a well-defined land use securing particular services, iii) is being

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bought by at least one ecosystem services buyer, iv) from the provider or seller of the services, v) only if the agreed conditionality is fulfilled.

The definition of PES is however, context specific and varies widely from a narrow market-based definition with direct transactions between service providers and beneficiaries (that include schemes where private buyers and sellers arrange voluntary and conditional transactions for the delivery of ecosystem services) to a broader scheme where those who benefit from the services pay (usually indirectly) those who maintain or enhance the services, (TU-CDES and ICIMOD 2017).

In a practical sense, it is difficult to establish a purely market-based PES schemes describing the commoditization of ecosystem services in a free market (Fletcher et al. 2016). At the same time, there have been several arguments under neoliberalism claiming that purely market based PES schemes do not necessarily benefit poor segments of the population (Corbera et al. 2007; Proctor et al. 2008; McAfee and Shapiro 2010). Therefore, scholars suggest moving from a purely market based financial instrument, and consider PES as an incentive to local communities that ensure and recognize their efforts in conserving natural capital through redistribution of resources and transfer of financial support. (Gutman 2007; Kumar and Managi 2009; Bhatta et al. 2017).

In the South Asia Himalayan context, the market-based payment mechanisms (commonly used elsewhere) are not always the only answer, which is largely limited to cash transfer. Given the typical specificities of the Himalayan region, such as limited legal land tenure and ownership right, small holding farming system, limits the access of mountain communities to services like water, health, sanitation, banking, and markets. As a consequence, smallholders in mountain areas may have low coping capacity to stresses. As a reason, a combination of both market and non-market based or only non-market-based incentives may be more effective than the payments alone.

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Hence, an incentive for ecosystem services (IES) or incentive based mechanism should be ensured in the mountain environment such that the service providers are well supported and directly benefitted through various development projects or materials or services provided in-kind, which could also be beneficial to members of the larger communities (Rai et al. 2016; Bhatta et al. 2017). On the other hand, the buyers of the services in the mountain areas themselves are cash-poor, therefore, they may offer development assistance or resources in kind as a proposed payment (Patterson et al. 2017).

The IES schemes have been applied around the world in one form or the other, often under the definition of Payments for Ecosystem Services (PES). In the Himalayan region, there are already many such "PES like" schemes existent and operational ensuring both or either of the financial and non-financial benefits through an established institutional mechanism (Bhatta et al. 2014; Bhatta and Kotru 2012). Such incentive-based mechanism could lead into meaningful contributions to community and rural development (including local institutions), income diversification, cooperation, and resilience. Hence, IES schemes could be an important source of financing for sustainable development and adaptation to/mitigation of climate change.

2. Policy and Institutions Arrangements Related to Incentive for Ecosystem Services in Himalayan Region

The United Nations Conventions on Biological Diversity (UNCBD), and its Nagoya protocol provisions for the incentive and benefit sharing mechanism for biodiversity and ecosystem services. Countries in the Himalayan region, including Nepal, are the conference of parties to the UNCBD, and therefore committed for the incentive or/and benefit sharing mechanism through their national policies and legislative instruments. "PES-like" concept is not new in HKH region. There are some enabling policies and legislative framework that supports the provision for incentives for providing ecosystem services of HKH region countries.

Nepal, a mountainous country, committed for the conservation of its biological diversity and ecosystems. The National Biodiversity Strategy and Action Plan (NBSAP) discussed on possible incentive and benefit sharing mechanism for the sustainable supply of ecosystem goods and

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services. The recent revision on Nepal's Forest Act (2019) clearly discussed on incentive for ecosystem services and provisions for carbon services. Similarly, Nepal's National Park and Wildlife Conservation Act (2029) allows incentive for buffer zone communities to ensure their contribution to conservation of national park resources. Similarly, Nepal's National water resource policy, Tourism Policy, and other relevant policies empower local communities to manage local natural resources and mandate to share certain percent of revenue with local communities for their well-being (Bhatta et al. 2014).

Similarly, in Bhutan, The Water Act of Bhutan (2011), the National Forest Policy of Bhutan (2011), the National Environment Act (2007), Bhutan Water Policy (2007), the National Environment Strategy of Bhutan (1998) also enable adoption of IES mechanism in Bhutan to maintain and achieve its target of 60% forest coverage for all times to come (Phuntshok 2014).

In India, the 12th Finance Commission (2005-10) recognized the need to invest in resources and allocated IRs 1000 crores (USD 14 million) for 5 years to be given to states for preserving forest for the first time (Singh, 2010). The recent forest policy in India, including state level policies such as in Uttarakhand state, discussed on incentive-based mechanism for ecosystem services in India.

While in China, "eco-compensation schemes" encompasses both IES like policies that involve direct payments from the government to individual and community, as well as policies that develop framework of cooperation between various levels of government for financing and sharing cost of environmental protection and restoration (Zhen and Zhang 2011).

The above examples highlight some of the existing policies and legislations in the Himalayan region which support and integrate IES mechanism. However, concrete umbrella policy or legislative framework on incentive-based ecosystem service such as used in Costa Rica and Vietnam is lacking (Bhatta et al. 2014; Porras et al. 2013). Therefore, the recognition of IES schemes in the law, nationally and regionally, is required to integrate incentive based environmental management into different development sectors, and to implement and promote this scheme.

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Incentive for ecosystem services is gaining support from local government and communities because of being an incentive mechanism and a poverty reduction program (Lipper et al. 2009). IES is driven by various stakeholder such as local communities, private institutions, national and international nongovernmental organization and local government. As this mechanism comprises multi-sectors and multi stakeholder approach, coordination and collaboration of different stakeholders is needed. Rai et al. (2017) suggested that tripartite institution involving local government, local communities and government organization is well accepted by stakeholders of Nepal to implement effective and efficient IES schemes.

3. Incentive for Ecosystem Services: Evidences from the Region

There are a number of PES like or incentive schemes operational in the Himalayan countries, ranging from wildlife hunting to water resource conservation. Below table summarizing some of incentive mechanism for ecosystem services provide the basis for possible upscaling in similar countries, including Nepal.

Table 1: Summary of IES mechanism in the selected countries in the Himalaya

Cases/Country	**Stakeholders and major ecosystem services**	**Incentive mechanism established /Arrangement**
Community based Trophy Hunting, Gilgit-Baltistan, Pakistan	Local communities (Tehsil), Forest Department, Tourism Wildlife habitat management and population control	CTHP is an effective IES scheme that not only protects the biodiversity, particularly ungulates in Pakistan but also provides incentives to the local communities in exchange of managing and conserving threatened species. Besides, this program is able to reduce illegal and unregulated hunting of wild species and able to increase the number of threatened species. IUCN and WWF facilitated incentive based mechanism where 80% of total revenue generated from the trophy hunting of Siberian ibex (*Capra ibex sibirica*), (is provided to local committee. In 2016 alone, USD 295,000 was provided to the local communities (Khan, 2015).

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Drinking water supply, Dhulikhel, Nepal	Dhulikhel municipality, Upstream Community Forest user group, Water supply management committee Drinking water supply	A formal agreement is done between Dhuilkhel municipality and upstream Bhumidanda rural municipality (water source). Downstream water consumers pay Nrs 1 million per year to upstream water suppliers, including cost of forest watcher. Besides, Dhulikhel hospital provides subsidy on medical treatment for upstream resident, and Kathmandu university offers a scholarship for student from upstream communities.
Protected Areas for Sustainable Tourism, Nepal (case from Chitwan National Park)	Department of National Parks and Wildlife Conservation, Buffer zone management council, Private sector (hoteliers) Biodiversity services, Tourism services	Nepal's National Parks and Wildlife Conservation Act (1973) provisions for the buffer zone area as a protective layer to the core national park area. Under the Act, the Buffer Zone management Regulation (1996) provisions for the sharing of revenue to buffer zone management council, and made a provision that 30-50% of the total revenue generated by a protected area needs to plough back to buffer zone. This incentive mechanism ensures local participation on biodiversity and national park management. The Chitwan national park is one of the most tourist visiting protected areas of Nepal, and generates about 2 to 2.5 million USD revenue per year. In 2017, a total of around USD 800,000 was plough back to buffer zone committee (Silwal et al. 2016, DNPWC, 2016)
Wetlands restoration in Polder Xipanshanzhou, Dongting Lake, China	Farmers group and land owners, Country Government, Department of watershed Wetland restoration, and water resources	Dongting Lake, the second largest freshwater lake of China, naturally connected with the Yangtze River (Pan et al. 2011). This wetland is rich in biodiversity, including threatened species. After the devastating flood in Yangtze River in 1996 and 1998, the Government of Republic China implemented the policy of "Returning Farmland to Lake (RFL)" (Zhou et al. 2001) to protect the middle and lower reaches of the Yantze River basin from frequent flooding and

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		severe damage (Pan et al. 2011). The Polder Xipansanzhou, one of the pilot sites of RLF, inhabited 177 farming households with 580 populations lived on former lakebed and grew paddy. These incentive-based mechanism helped to raise the average annual income of the famer about $316 (from paddy) before 1998 to about $ 1636 in 2003 (Pan et al. 2011). This scheme not only resulted in higher income but also increase well-being and reduced vulnerability to flooding.
Mongar Water Supply, Bhutan	Watershed management Division/Ministry of Agriculture and Forestry, User committee, Landowners Drinking water supply	Mongar town drinking water supply schemes provide water to entire resident of the town. The incentive mechanism was initiated in 2088/2009 where a formal agreement was done with ecosystem service provider groups. The environmental service provider group's watershed area consisting of 373.129 acres should be protected without resource extraction. It must be maintained as an excellent recharging area for three spring sources. Their management activities are paid Nu 80,000 per year by the town users and Nu 20,000 from MRRH. Annually, the ES provider shall plant a native species in the watershed's degraded area within a community forest to improve the forest condition. Therefore, the service charge is Nu 30,000 from town users and Nu 10,000 from MRRH. The ES provider has to look after the ES provider and is paid Nu 10,000 a year by the town user and Nu 5,000 by MRRH. (Norten, U, 2021)

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4. Discussions

In developing and mountain countries, a fully market-based instrument may be difficult to practice, even with substantial investments in establishing institutions and governance mechanism (Fletcher et al. 2016). As a result, a context specific approach, sometimes very specific to site or location needs to be discussed and implemented. The incentives for Ecosystem Services (IES) is locally designed in such a way that they are relevant to the cultures, policies, ecosystems and specific factors affecting the demand and supply of ecosystem services in a particular place. Therefore, IES is not a 'one-size-fits-all' solution. IES is voluntary transaction involving a well-defined ecosystem service from a specific geographic origin with a set of quantity/quality services supplied to the beneficiaries over a given time period (Patterson et al. 2017). It is used a tool to maintain or improve the flow of ecosystem services, while rewarding the managers of that ecosystem services. According to a pre-agreed system on IES, the incentive is generally transferred from the users/beneficiaries of the services to the service providers via the IES system. The IES system includes the agreement, duration, verification methods, mechanisms for consultation and improvement of the services over time.

A well-designed IES system i) accounts for the benefits to both ecosystems and livelihoods, ii) has a structure for inclusion of and dialogue among all participants, iii) provides explicit monitoring for unintended consequences, and iv) includes system improvement over time (Patterson et al. 2017). IES also contributes to the Sustainable Development Goals (SDGs) by improving ecosystem functioning, maintaining ecosystem service flows, supporting biodiversity, and conserving the habitats and its restoration. There is a triple win scenario if the IES tool is effectively applied, mainly benefiting i) the ecosystems, ii) the community who is managing the ecosystems, and iii) the consumer of the services. However, at the same time, ecosystem resources are treated as common goods which pose challenges in terms of responsibility for its management which consequently limit the provisioning of incentive payments.

While mountainous and developing countries do have their own specificities with low oncome and cash deficit, payment mechanism should be treated in a holistic way, rather limiting it to the

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direct cash payment. As a reason, the term "incentive for ecosystem services" is more appropriate in Nepalese context. Below discussions further provides details on this concept.

Payment Vs Incentive

In the Nepalese Himalaya, the upstream management activities depend on support provided by ecosystem service users and the payments are usually based on improved quantity and/or quality of particular ecosystem services under the agreement. In many cases, it is observed that there is no clear linkage between ecosystem management activities and improved quantity of particular ecosystem services. It is therefore, complex to determine how much particular ecosystem services can be increased through specific management activities. In such cases, the resource managers who are comparatively poor, may be in risk as their inputs may not be able to produce expected outcomes. As a result, the resource managers may receive less payments than expected. Therefore, an input-based payments as incentives might encourage the resource managers to participate in ecosystem management to maintain and enhance the supply of ecosystem services.

Cash Vs Kind Payment

The users/buyers of the ecosystem services have a genuine concern whether their payment in term of cash will be spent on specified activities or not. Simultaneously, the resource managers too have similar concerns whether they will benefit from such payments given the power dynamics prevailing among the communities, governance system or corporate entities. Additionally, in many cases where cash payment is involved, it is difficult to ensure financial transparency and equitable benefit sharing due to limited technology, infrastructure and facilities (such as banks and institutions to monitor/enforce/ adjudicate agreements). Therefore, in-kind payment within an agreed framework would be better than the cash payment as it largely targets to communal development.

When implementing IES scheme, some elements need to be cautiously addressed, otherwise this may result into unintended consequences in many forms such as- social, environmental and distributional impacts. The social consequences include cultural impacts, covering changes to

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norms, values and beliefs and therefore relationships, agreements and power distribution. For example, labour rights, gender equity, access to education, health and sanitation, and cultural identity. Likewise, environmental consequences can occur when a pressure to improve one part of the system results into deterioration of another part. The distributional impacts affect the power balance, peace and resilience of a community in terms of whether there are differences in access to capital, loans and secure banking; differences in access to new technologies and integrated value chains; whether gender biasness exist on access to resources, participation and empowerment to manage lands and finances; how resilient are the community to economic risk (example new businesses). To avoid such unintended consequences or pitfalls in the IES scheme, the designers and implementers of IES schemes are obligated to monitor the affected parties and verify whether the IES intended outcome is being produced.

5. Conclusion

The experiences from the region showed a promising possibility to implement incentive-based mechanism to encourage and acknowledge mountain communities for their efforts in conserving the ecosystem to maintain and/or improve the ecosystem services. However, to make Payment for Ecosystem Service schemes successful, it is essential to have a clarity and transparency on conditionality, land tenure rights, contracting provisions supported by the legislative instruments, equitable benefit sharing mechanism and monitoring framework. Since, the IES schemes are designed based on local context, culture and priority so, one in all approach may not fit across the region. Thus, an overarching framework might be helpful to streamline such schemes at the national and or trans-boundary level.

PES is considered as one of the strategies for biodiversity conservation and sustaining ecosystem services. However, ideal PES seems not in to the Himalayan region, which need a contextual setting with ground realities. As a reason, Incentive for ecosystem services (IES) seems more appropriate in several ways, such as i) non-monetary transaction dominates due to cash poor in the region, ii) methodological complexities to link activities and ecosystem services.

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