Payments for Ecosystem Services in Bhutan

SYNTHESIS REPORT

Watershed Management Division

Department of Forests and Park Services,
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Payments for Ecosystem Services in Bhutan
Synthesis Report

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Acknowledgements

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Policy Pointers: Summary

1. **Payments for Ecosystem (PES) services are ways to turn the economic value of ecosystems into financial payments.** Thus, making the financial case to invest in healthy ecosystems through PES is important. This requiresevidence of forest ecosystem benefits as downstream water flows for hydroelectricity;and to people for example through forests for timber, non-wood forestproducts (NWFPs) and fodder.

2. **Direct conditional transfers to land managers can be effective ways to promote PES related behavioural changes** towards more sustainable practices, provided they are meaningful (e.g. in relation to costs/expectations). These conditions can include requirements for ecosystem improvements to receive the payment or to be paid for the work (ie public works programmes related to PES).

3. **Government agencies can be both a buyer and seller of PES services and in Bhutan this is important given the significant role of the state** as a seller through ownership of land in state protected areas and state forests and as a buyer through use offorest ecosystem services by the statehydropower company and state water utilities.

4. **Upscaling PES schemes from a few watersheds to a national level is crucial** to secure impacts across space and time and to overcome the transaction costs of negotiating with many buyers and sellers. This upscaling often requires aligning environmental and social goals (ie poverty reduction, employment) to engage political interest, combine budget lines and promote collaboration across different government departments. This is also needed to achieve national development goals (e.g. GNH, SDGs, climate change).

5. **Bhutan has started to promote PES, but currently these are small scale niche schemes and no national PES scheme exists.** These small-scale PES schemes are focused on water supply in selected rivers, but only a few thousand households are involved.

6. **The foundations of a national PES scheme in Bhutan have now been laid** as the Ministry of Economic Affairs has been tasked to work with Ministry of Agricultural and Forests to reinvest a share of the hydropower royalty in watershed management. This report is designed to inform that process. It is estimated that in 2015 a share of 1% of the 15% hydropower royalties would be equal to 10 million Nu -about the current annual budget of WMD. These royalties are set to triple in the next three years and then further increase with future hydro developments so they could make a major contribution to the WMD budget. Payments could go via the Government budget of the Ministry of Finance or through a Trust Fund such as the Bhutan Trust Fund for Environment or be paid direct from the Druk Green Power Company.

7. **Already the Druk Green Power Corporation pays for upstream afforestation** in some of its watersheds and this form of direct payments could be expanded.

8. **The other option for a national PES scheme would be based on some share of foreign tourist revenues** as currently 18% of non-regional foreign tourists come to Bhutan for nature-based activities. Currently tourists pay for some protected areas and some cultural sites and this could be reinvested in watershed management.

9. **An effective PES scheme should finance investments by government agencies in watersheds but should also compensate local communities for the costs of human wildlife conflict** on crops, livestock, property and personal injury due to forest based wild animals, such as wild boar, monkeys, elephants and tigers.

10. **Where PES payments are targeted at households for human wildlife conflict or for managing forests on non- state land, it is most effective to use existing payment schemes, in particular through the Rural Economic Advancement Programme (REAP) or Community Forest Groups.** The REAP programme targets reaching poor rural households in 109 villages in 20 Dzongkhags by June 2017 (GNHC, 2016). Community Forestry now includes over 500 groups including up to a third of the rural population (WMD, 2015, Corruption Risk Assessment for REDD+). Community forestry groups are the sellers of forest ecosystem services in the three existing pilot PES schemes in Bhutan at Yakpugang (Mongar), Burkhey (Pasakha/Chukha) and Namey Nichu (Paro).

1 Payment for Ecosystem Services (PES): introduction

1.1 Definition of PES

Payments for Ecosystem Services (PES) are conditional financial transfers that work in two ways(Porras et al. 2017)

1) As incentives to managers of ecosystems, (which can include government agencies for state owned lands) in exchange for pre-agreed activities (e.g. rehabilitation of watersheds, conservation of cloud forests) that are expected to improve the delivery of a particular ecosystem service (e.g. water regulation);
2) As payments or transfers from those who benefit from these environmental investments, for example water utilities or hydropower companies (both public and private) where public government agencies make payments on behalf of their people.

The key characteristic that sets PES apart from other environmental instruments is their conditionality: on delivery of the land management contracts, or by measuring the changes in the level of the ecosystem services. This mechanism is increasingly being applied in the context of various ecosystem services such as watershed conservation, biodiversity, carbon sequestration, and eco-tourism(Ojha et al. 2005)

This definition goes beyond the definition of Wunder (2005), by allowing government agencies to be a buyer (eg through general taxation or state-owned utilities) and provider of ecosystem services (eg through state owned protected areas and state forests). For Bhutan where government plays a major role in the economy, this definition which includes government is more appropriate.

1.2 The challenges of upscaling PES

The success of PES at the local level is affected by multiple variables that include the scientific linkages between action-outcome, the economics of the transaction (e.g. how meaningful are the financial flows in relation to costs), and governance and institutional issues at the core (property rights, technical capacity, monitoring, transaction costs, etc).

While PES has been in existence for over 20 years, most schemes remain small-scale, niche schemes focused on specific watersheds and river basins. Often these schemes have taken many years to negotiate due to “high transaction costs” ie the costs of working out complex scientific and economic agreements between numerous buyers and sellers. These same transaction costs may also limit the number of households receiving payments.

So the second generation issue facing PES is to upscale towards national schemes to overcome these transaction costs. Upscaling faces a whole new set of challenges, but can also offer new opportunities, for example by enlarging the pool of beneficiaries (or sellers).

1.3 Objectives of this report

Bhutan has developed small scale PES schemes but is now about to embark on developing a national PES scheme. This report summarises experience so far in Bhutan as well as experience from other countries that can help inform the process of moving to a national PES scheme in Bhutan. The document is divided in three sections:

- Section 1: This section on the introduction to PES.
- Section 2: Overview of PES in Bhutan
- Section 3: Review of international PES experience
- Section 4: Way forward for Bhutan

1.4 Criteria of successful PES

Payments for Ecosystem Services programmes do not take place in a vacuum. Experience of the most successful programmes – those that have managed to achieve financial stability and upscaling - are based on a combination of four aspects:

1) A clear **strategy for sustainable financing**, which goes beyond voluntary agreements;
2) A **combination of strategies to invest resources at the local level**, where direct cash payments are one of potential instruments that could be used;
3) Upfront approach to **linking agendas to support the case** for investing in sustainable natural capital and ecosystem management. For example, creating specific strategies for poverty reduction, and demonstrating the social and economic rates of return attached to these projects;
4) A **practical approach to implementation and upscaling**, which makes use of the latest research including scientific models to design and for M&E, natural capital accounting and expenditure reviews and monitoring tools;

Each component is important in the design of appropriate instruments for ecosystem management. In this section we summarise some of the most recent and relevant advances, especially in the context of designing a PES programme. Section 3 will present examples of implementation at scales in various countries.

1.5 When is PES appropriate

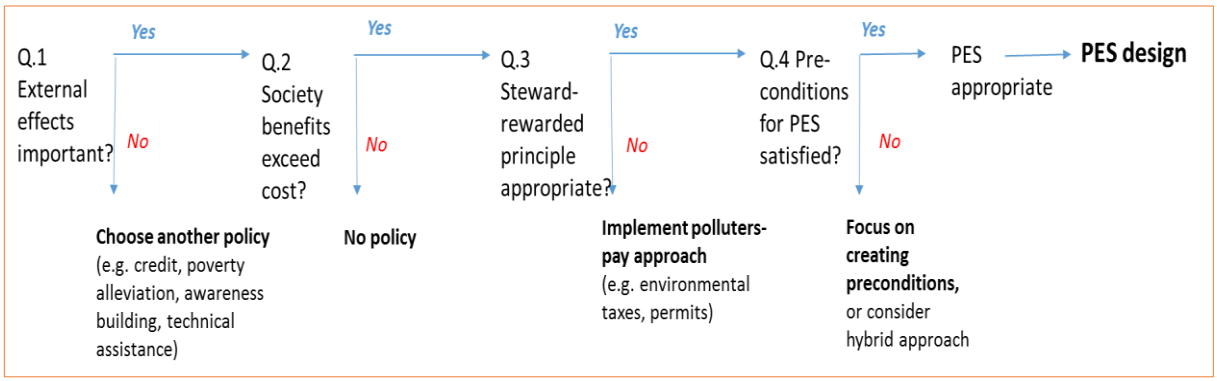
As Table 1shows, there is a variety of instruments to implement improvements in land management. The appropriateness of PES depends not only on the type of environmental degradation but also on the root of the problem. Table 1 presents some examples of type of instruments that can be used depending on the causes of environmental degradation. Figure 1 below shows a useful decision guide for considering PES as a suitable instrument.

Source of environmental degradation	Potential instrument to correct externality
Insecure property rights/ common property dilemmas	Securing property rights, community-based management;
Credit market imperfections/ lack of collaterals/ risk	Credit policies, micro-credit, soft loans, collaterals.
Extreme poverty	Unconditional transfers, job creation

	through public environmental works; hybrid models based on ICDP
Encroaching from other activities (e.g. mining, agriculture, urbanisation, road building)	Elimination of perverse subsidies (e.g. to groundwater extractions, agriculture, mining); environmental taxes/tradable permits and command-and-control using polluters-pay principle;
Lack of awareness	Information campaigns, biophysical and economic studies; targeted communication strategies.
Society benefits of ES > private costs of implementing; defined and enforceable property rights	PES and other forms of environmental conditional transfers

Table 1. Environmental problems and potential instruments

Figure 1. Decision guide for determining if PES is the appropriate policy approach



Source: Adapted from Engel (2015)

1.6 Types of PES

In this section, we concentrate on three types of conditional rewards: PES as environmental conditional transfers, public environmental works, and hybrid models similar to Integrated Conservation and Development Projects (ICDPs).

PES through environmental conditional transfers. These are positive economic incentives that addresses an environmental externality through conditional payments (made in cash or kind). The provider of ES voluntarily responds to an offer of compensation for activities clearly linked to the provision of ES. In practice, PES is financed by local or central governments, NGOs, or private companies who have a stake on the provision of the ES. PES is anchored in the use of payments to correct an economic externality (Pigou 1920, Coase 1960). Coase argues that socially sub-optimal situations, in this case poor provision of ecological services, can be corrected through voluntary market-like transactions provided transaction costs are low and property rights are clearly defined and enforced. A challenge of PES is linked to operating in situations with (potentially) high transaction costs and less than clear property rights. (Muradian et al. 2010, Tacconi et al. 2010, Engel 2015, Porras et

al. 2015, Wunder 2015, Porras et al. 2016b). PES has been used to support the provision of regulation ecosystem services for water, soil formation and GHG through forest (including mangroves) protection and conservation, agroforestry, improved agricultural systems, and as compensations for the implementation of marine protected areas. Most schemes remain watershed specific niche schemes, such as Lao PDR and Nepal. But there are some emerging examples of national programmes implementing conditional PES instruments including China, Costa Rica, Mexico and Viet Nam. Bhutan still has primarily niche, watershed specific environmental conditional PES schemes.

PES through public environmental works and job creation. Social protection is a collection of government policies and programmes aimed at preventing, managing and overcoming situations that adversely affect people's wellbeing. They are usually targeted at individuals economically at risk, chronically poor and or socially vulnerable (Porras et al. 2016b). Social protection is increasingly used in combination with environmental objectives, making explicit linkages between poverty reduction and environmental investments. There are examples programmes that explicitly combine poverty and environmental objectives, making direct investments (mostly through job creation) into environmental improvements. Three of these include India's Mahatma Gandhi Rural Employment Guarantee Scheme; the Philippines' Greening the Nation Scheme; and the South Africa's Working for Environmental Works programme.

Table 2 presents a summary of some of the main advantages and disadvantages of combining social protection with environmental objectives.

Advantages	Disadvantages
• Generally agreed that poverty and environment are linked and the poor may be in areas of rich biodiversity and climate vulnerability. Investment in the environment can be seen as supporting natural capital assets of the poor. • Political pull: in most contexts the social agenda carries more votes (and therefore political traction) than conservation; combining them can help support conservation. • Budget share: poverty and social agendas have allocated budgets and institutions — it may be possible to link institutional transfer schemes, reducing transaction (ie administrative) costs.	• Overloading agendas can increase administrate costs and reduce impact. • Geographic targeting: the poor may not be located where the environmental problems/objectives are and vice versa. • Using PES can create rent-seeking behaviours and contribute to asymmetric power distribution. • Poor people may have higher priorities than making conditional behaviour changes for environmental objectives

Table 2. Advantages and disadvantages of combining social and environmental objectives

Source: Based on Porras et al (2016).

PES through hybrid schemes with integrated conservation and development programmes (ICDPs). Integrated conservation and development programmes (ICDPs) exist to manage households living in protected area and their surroundings. While traditionally ICDPs have been financed as a conventional development projects with government or donor finance, it can be converted into a PES programme by requiring the communities to make certain conservation behaviours in exchange for payments. The advantage of the PES approach can be a clearer set of conservation outcomes and a potentially additional source of payments. Brazil has such a scheme in its most biodiversity rich region of the Amazon.

2 Payments for Ecosystem Services in Bhutan

2.1 Rationale for PES in Bhutan

In Bhutan, investment in natural resource management is primarily made through regular budgetary allocations to the Ministry of Agriculture and Forests (MoAF). This natural resource investment competes with other sectors, such as infrastructure development and improvements in health and education.

Land, water and forests provide vital services to specific resource users including hydropower, tourism, water for industry and domestic users, users of timber, fodder and NWFPs. These forest ecosystems avoid damage to hydropower turbines and dams and reduce treatment costs for drinking water downstream Thus there may be the potential for additional, earmarked investment from the resource users to maintain forest cover and rural landscapes intact. These earmarked investments would compensate land managers including government for forestry management in national parks and sanctuaries and farmers for costs of development foregone and for accepting human wildlife damage to crops and livestock from forest based animals.

2.2 Natural resources in Bhutan: potential for Payments for Ecosystem Services (PES)

Much of the PES schemes in Bhutan are linked to its rich forest and inland water resources in the watersheds. Forest ecosystems constitute more than 72% of the total national land cover making it a vast resource for developing PES schemes (Table 3). Forest, agriculture including livestock are the dominant sectors that provide livelihood, income and employment to 69% of the total population. Numerous glaciers and lakes (2,674) rivers, marshy lakes and springs have built-up extensive aquatic ecosystem (Table 4)yielding a huge volume of water, accounting for more than 100000 m^3 per capita availability of water annually. However localised water scarcity is still a common and growing problem.

Water is mainly used for agriculture and hydropower production. The Water Policy of 2008 accords the highest priority to drinking and irrigation water given the high incidences of water scarcity reported in the country. The water demand is increasing and it is projected that demand will increase from 25.6 million cubic meters in 2010 to 41.7 million cubic meter in 2020, and irrigation demand from 460 in 2010 to 498 million cubic meter in 2020(Wangda and Norbu 2013). The total hydropower generation potential of the country is estimated at 23,765 megawatt (MW). The tourism sector, much of it depending on the pristine natural environment, is growing an important contributor to export revenue.

Table 3. Forest Ecosystem and Examples of ecosystem services in Bhutan

Ecofloristic Zone (masl)	Main forest types	Characteristic fauna	Examples of Ecosystem Services derived
Alpine zone above 4000 masl	Alpine meadows and scrubs	Snow leopard, Lynx, Blue sheep, Himalayan marmot, Tibetan wolf, Takin, Musk deer	Grazing, fuelwood, medicinal plants, recreation and tourism. Biodiversity
Temperate Zone (2000-4000)	-Fir forests (2700-3800) -Mixed conifer forests (2000-3800m) -Bluepine forest (1800-3000m) -Chirpine forest (900-1800m) -Broad leaved forest mixed with conifer forests (2400-3000m)	Goral, Serow, Black bear, Grey langur, Red panda, Assamese macaque, Leopard,Tiger, Golden cat, Clouded leopard.	Wood, water, tourism Wood, leaf litter collection, collection, water, grazing, biodiversity
Subtropical Zone (150 -2000)	-Upland Hard wood (2000-2900m) -Lowland Hardwood (1000-2000m) -Tropical Lowland Forest(below 700 m)	Water buffalo,Golden langur, Sambar deer,Tiger, Golden cat,Clouded leopard,Capped langur, Gaur.	Wood, grazing, erosion control, NWFP, erosion control, soil protection, flood regulation

Adapted from MoA (2014)

Table 4. Aquatic ecosystem

River Basin	Major Tributaries	Basin Area (km2)
Amo Chhu (Toorsa)		2,400
Wang Chhu	Thim Chhu, Pa Chhu, Ha Chhu	4,689
Puna Tsang Chhu (Sunkosh)	Pho Chhu, Mo Chhu , Dang Chhu, Daga Chhu	10,355
Drangme Chhu (Manas)	Mangde Chhu, Chume Chamkhar Chhu, Kuri Chhu, Kholongchhu, Gongri Chhu	16,599
Samtse area		962
Samdrup Jongkhar		2,279
Gaylegphug Area Multi-river		1,956
Shinkhar-Lauri Multi-river		779

Source: Water Resource Management Plan, DoE (2003) Adapted from MoA (2009)

2.3 Scope for Payment for Environmental Services

Economic growth in Bhutan between 2007 to 2012 has significantly grown averaging 9% increase per year. The Living Standard Survey Report 2012, showed that average per capita household income was Nu 45,538 /year (National Statistics Bureau 2013). Bhutan Poverty Analysis 2012 revealed that 12 % of the population are "consumption poor', half the number compared to 2007(GNHC 2015). About 95% percent of the poor population live in rural areas (Figure 2). The extreme poverty (US$1.25 per day in Purchasing power parity term) has fallen to 2% of the total population (NSB 2015) as shown in the figure below.

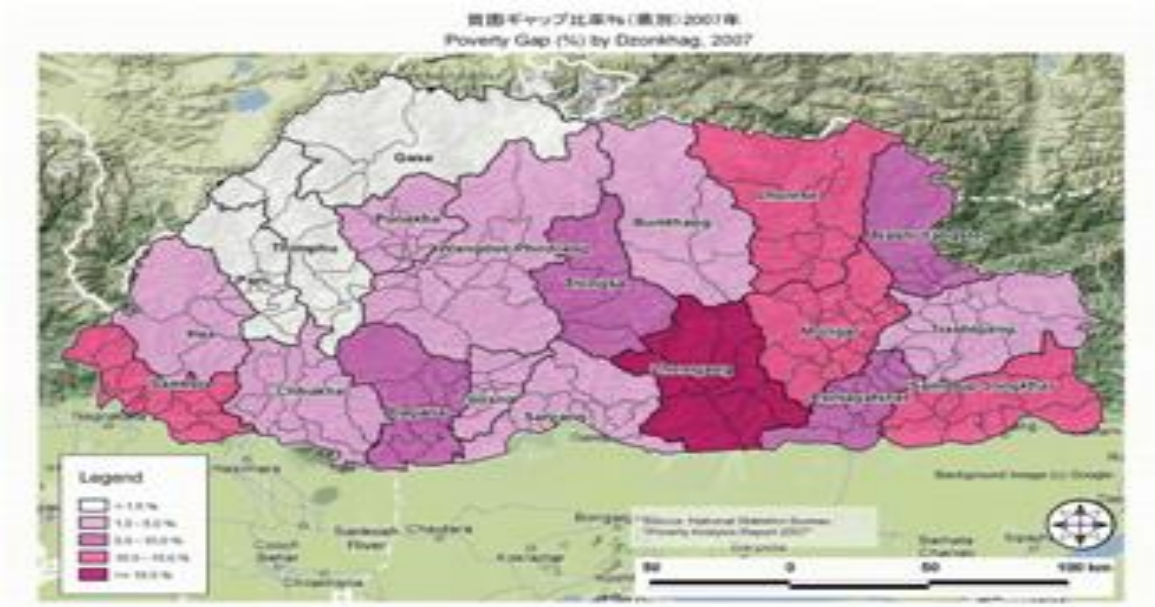


Figure 2. Poverty Gap by Dzongkhag in 2007 (JICA 2010)

Natural resource dependent sectors i.e. agriculture, livestock and forests play important role in Bhutan's Gross Domestic Product's (GDP) growth, accounting to 16.8% of GDP(MOaF 2016). Hydropower contribution is estimated around 11% of GDP in 2015 (National Statistics Bureau 2016)and its contribution will increase with establishing of more hydropower infrastructure. Thus, a significant part of Bhutan's current and prospective economic gains are derived from the use of natural capital such as forest and other ecosystem services. While the direct benefits of provided by the forest ecosystem i.e. food, timber, NWFPs etc. are tangible and have market values, the regulation and supporting services provided by forest ecosystem services (e.g. watershed services; biodiversity conservation; natural landscape; and carbon sequestration) are less visible.

Putting monetary values for those ecosystem services can provide the basis for PES schemes. The hidden costs of up-keeping watershed services, biodiversity conservation, natural landscapes, drinking/irrigation water and carbon sequestration are borne by the custodian of forest resources (MoAF/RGoB),but unfortunately many stake holders remain unaware of these vital ecosystem services are provided by forests and other ecosystems

.This ecosystem valuation system should include ecosystem services (e.g. water regulation, soil protection, climate regulation) and create awareness about their contribution of ES to Bhutan so that all stakeholders would share both the benefits and costs of maintaining these ecosystem services. Also, capacity needs to be built to undertake ecosystem evaluation to mainstream contribution of all ecosystem services including regulating services, cultural services and supporting services into natural capital accounting in the context of national development planning and national income accounting.

In Bhutan current studies embarked on ecosystem valuation are preliminary. The Bureau of Statistics is exploring with GNHC the options for natural capital accounting which could include forest, water and energy accounts. The DoFPS has taken various initiatives to assess the value of ecosystem services and the potential of instruments such as REDD+, PES, and Climate Change. The value of ecosystem services using benefit transfer methodology had been assessed to examine the overall contribution of ecosystem services to the Bhutanese economy. The total estimated value of the stock of Bhutan's ecosystem services was approximately $15.5 billion/yr (Nu 760 billion/yr), significantly greater than the Gross Domestic Product (GDP) of $3.5 billion/yr ((Kubiszewski et al. 2013). Also, DoFPS (2010) have attempted to assess the contribution of National Parks and Biological Reserves to the social and economic development though conduct of Case studies in Jigme Dorji Wangchuck National Park (JWNP), Jigme Singye Wangchuck National Park (JSWNP), Bumdeling Wildlife Sanctuary National Park (BNP) and Royal Manas National Park (RMNP), under the programme of South-South corporation for sustainable development among Benin, Bhutan and Costa Rica Reciprocal Project.

2.4 Current policies and approaches to Payment for Environmental Services(PES)

Bhutan has a favourable policy context to develop PES. A number of enabling policies, laws and institutions are in place that would enable the establishment of innovative mechanisms such as Payment for Environmental Services (PES), for improving livelihoods while conserving and utilizing natural resources(Wangda and Norbu 2013). The Forest Policy (2011) and the National Environment Policy (2006) recognizes the innovative PES concept and the National Food Security Strategy Paper (2006) and National Water Act (2011) identify PES as a potential means to tap into additional financial sources for improving household food security.

The Bhutan Sustainable Hydropower Development Policy of 2008, states a minimum of 1% royalty energy revenue is to be made available on annual basis to MoAF for integrated sustainable water resources management including catchment protection and nature conservation, to support the clause "*Ensure that the hydropower development is in accordance with the sustainable development policy of the Royal Government, keeping in view the fragile mountain ecosystem of the country* ''

2.5 Current pilot PES projects in Bhutan

While the PES idea is not new in Bhutan, the actual implementation has been constrained by limited field experiences that can demonstrate clear results. There have been two main attempts to develop PES pilots: firstly, with FAO support in 2009 and then more recently under the REDD+ programme in 2015.

The first attempt was with financial support from the FAO Multi-Donor Partnership Program (FMPP), the Watershed Management Division (WMD), Department of Forest and Park Service analyzed the feasibility of developing PES mechanisms and identified three pilot project sites in Paro, Wandgue and Mongar Dzongkhags in 2009 (Box 1). The aim of the exercise was to align ongoing PES-related initiatives and create the incentives amongst stakeholders to initiate PES scheme for sustainable natural resource management.

Box 1. PES initiatives with financial support from FAO Multi-Donor Partnership Program (FMPP)

PES are agreements made between users of environmental services and those who manage the lands that provide these services. The initiatives are:

1 **Drinking water users in Mongar**, East Bhutan, agreed to pay the farmers protecting the forests covering the catchment of the water source in Yakpugang. Local community at the head waters manage forests and conduct additional activities within the community forest to protect water quality and enhance the quantity available in low season.

2 **Woochu, Paro Dzongkhag**, a PES scheme can demonstrate evidence–based information that the health of the Wang river (a lot of hydrological data was available generated by the Watershed Management Project) , depends on the management of its tributaries and the settlements, farms and forests on the slopes by introducing specific improved land management options and monitoring the impact

3 Another PES scheme was planned to compensate the communities living in the **Phobjikha valley**, **Wangdue**, for the development constraints they face by living in a conservation area, through increase in the local capture of tourism revenues. This compensation could come in the form of financial and technical support to develop additional income generating activities that do not negatively impact on the ecology of the wetland and its quality as habitat for the black-necked cranes that visit the area every winter.

Adapted from Bhutan FAO PES feasibility assessment (2009)

Although three potential PES schemes were identified in 2009, a full-fledged PES scheme was only actually implemented by the Yakpugang PES Scheme in 2010 with WMD, as intermediary**,** working together with Mongar Dzongkhag, RDC, Wengkhar and DoFPS, Mongar. The contractual agreement was signed between the Yakpugang CFMG as ES provider and Monger Town Water Users as ES users for three years (January 1, 2011 to December 30, 2013). The contractual agreement was subsequently renewed for another five years (January 1, 2015 to December 2019) on successful completion of the first term with addition of new clause such as increased fees and inclusion of additional ES user (Eastern Regional Referral Hospital, Mongar).

Then in 2013, the WMD along with SNV Bhutan, financed by Blue moon fund (bmf), USA and Bhutan Trust Fund (BTF) implemented the project entitled "Integrating PES and REDD+ in Bhutan". Through this project instead of developing separate Framework for PES and REDD+, a common framework was adapted incorporating aspects of both PES and REDD+ as REDD+ was viewed as one type of PES. The project had three key objectives (WMD 2015):

1. To develop a National PES (Policy) framework based on experiences generated from demonstration pilot sites and align with the national REDD+ strategy.
2. To establish participatory PES models, incorporating REDD+ compliance with benefit distribution system (BDS) and Participatory forest monitoring mechanisms explored, designed and implemented at three sites
3. To build national and local capacities of government, private sector, and communities for PES and REDD+, fostered through development and application of training materials for key elements of PES/REDD+ schemes.

Under this project "Integrating PES and REDD+ in Bhutan", three pilot PES schemes, Yakpugang PES, (Mongar), Burkhey PES (Pasakha), Namey Nichu PES had been established and made functional. Other achievements include development and approval of National PES Framework (2015); a PES Field Guide for Bhutan (2015); and a PES Field Documentation Report, which were developed to facilitate up-scaling of PES; and various study visits and trainings were conducted for various stakeholders, both in-country and in the region. The key issues and the activities of three pilot PES are described in Table 5.

Table 5. Addressing key issues and activities in three existing PES Schemes:

Issues/activities	**Yakpugang PES, Mongar**	**Namey Nichu PES Paro**	**Burkhey Watershed PES (Pasakha),**
Background	5000 residents of Mongar township receives its drinking water supply from upstream CF. Protecting of water source as inadequate quality drinking water is the concern.	29 households manage CF to protect water sources ensuring quantity and quality of water for the household downstream hoteliers and other households.	Protection of springs in CF to secure quality water supply to industry complex
Establishing the baseline	The baseline for payment was calculated from the cost of carrying out 7 activities for protection of water sources in CF. Annually Nu 0.1428 million to be paid to ES providers	The baseline for payment was calculated from expenditure tin carrying out 7 activities for protection of water sources in CF. Annually Nu 0.142 million to be paid to ES providers	The baseline for payment was calculated for cost of carrying out 5 activities to protect underground spring source for drinking water. 0.48 million to be paid to ES providers in the first year and 0.125 million for the remaining four years
Land ownership and property rights	Community forest to be managed as per CF plan and PES agreement.	287 acres of community forest with users rights to 29 households and manage in accordance to CF plan and PES agreement.	CF with users rights to 23 households to be managed as per CF plan and PES agreement.
Risk Assessment	Setting a big area as buffer for protection has resulted in timber/ firewood shortage and community putting pressure on near-by state forests.	Individual tapping of drinking water and additional 100 private land owners can increase pressure on water supply	No serious concern expressed except the water source can dry up in winter as it is a natural spring
Identifying the right interventions	Maintain a buffer of50 m on both sides of major streams, On average, keep only 5 cattle per household and grazing cattle during day time only , clearing fallen trees, branches and debris, and guard against illegal collection of forest resources and grazing.	Maintaining and protecting a buffer area of 50 m radius on both sides of 3 streams, Guarding against illegal forest resources extraction and grazing, Clearing fallen trees, branches and debris, collect cattle during nights and no cowherd to be established within CF	Enrichment plantation of 2.5 acre around two outlets. Maintaining and protecting a buffer area of 50 m radius around 2 outlets. Guarding against grazing and provide fencing, and other structure (tanks, pipes) .Perform annual pujas for data.
Mode of payment	An 'inputs-based approach' with money provided by Mongar Township (Mongar Administration). Based on the results of the monitoring, the ES provider shall be paid an annual fee.	Mode of payment is an 'input-based approach' with money provided by group of downstream hoteliers on monitoring and verification.	Payment mode is an 'input-based approach' with money provided by industry users group following the monitoring and verification.
Building trust	-Clear terms and conditions were developed and periodical stakeholders meeting conducted.	-Clear terms and conditions were developed and explained to the stakeholders during meetings.	-Clear terms and conditions were developed and explained to the stakeholders.
Monitoring system	-Simple Verification and Monitoring format had been developed - Verification and Monitoring team conducts monitoring twice a year	-Simple Verification and Monitoring format developed -Verification and Monitoring Team conducts monitoring twice a year	-Simple Verification and Monitoring format developed - Verification and Monitoring conducts monitoring twice a year

2.6 Experiences and lessons drawn from three pilot PES schemes implementation

Monitoring and implementing these three PES schemes has generated useful lessons (WMD 2015)as follows:

- Both Environment service (ES) providers and ES users are gaining confidence and they felt that more PES schemes should be replicated in other parts of the country. Some opinions were expressed on the possibility of exploring and extending to other types of PES such as biodiversity conservation for tourism, watershed services for hydropower and bundling of different ES.

- The three existing drinking water PES schemes appear to be working well, as these schemes had perceived scarcity of clean water, and water users (e.g town residents, companies), have the capacity to pay the ES providers. Therefore, ES users are the most important stakeholders, as the viability and sustainably of the scheme is determined by the availability of ES users, who are willing to pay for the services provided.

- The terms and conditions of PES contractual agreement should be made clear and understood by all stake holders. The ES providers of Yakpugang PES faced problems of getting wood for local use as the distance of 100 m buffer forest stretch along streams (maintainedduring the initial PES term) overlap areas for wood use and protection. Such unclear understanding could lead to a "leakage"– where farmers would put heavy pressure for local use on nearby state reserved forests (SRF), while conserving PES scheme designated forests. Regular monitoring of PES scheme needs to be conducted by the intermediaries (e;g WMD, DoFPs) to ensure the activities are progressing as per terms and conditions. It was seen in the first contract period of Yakpugang PES, that payments were made from municipality budget instead of deducting from users accounts which was against the accounting system of Dzongkhag Administration. This resulted in delaying the contract renewal and ultimately led to late payment by ES users.

- The intermediaries need to be innovative and ensure ES users and providers can come together and have dialogue and understand each other's perspectives; discuss issues and resolve them together. In Paro PES, there were disagreements among users on the amount of payment to be made by each user. The intervention by intermediaries, bringing all users together in a common forum, and discussion resolved these issues.

- PES scheme implementation is relatively a new phenomenon and capacity building of all stakeholders including the intermediaries is key to the success of

the scheme. Carrying out extensive awareness and education campaigns on PES (concepts and practices) to all stake holders (including policy makers) is a priority. Periodic exchange visits or study tours to the successful scheme sites could prove to be very useful, especially to the new ES providers, as they could learn from the experiences of existing PES schemes.

- Valuation of ES can generate useful information to convince users to pay for the ecosystem services they receive. The initial valuation of ecosystem services using simple benefit transfer techniques has indicated that forests represent by far the largest contributor to ecosystem services (Kubiszewski 2013). However, the field experience from Namey Nichu PESParo show that while these valuation figures ran into millions, the actual payment agreed on less was than 0.150 million after discussions and negotiation among stake holders. This suggest that significant ecosystem values do not automatically transfer into financial payments through PES. It is also important to use non-benefit transfer methods for developing more realistic market-based valuation grounded in the Bhutanese context. National capacity and experience on conducting such ecosystem valuation is limited. Drawing from international experience to build capacity in conducting ecosystem evaluation and to select suitable methodologies is a priority and is now being taken forward by WMD with financial support from the World Bank REDD+ programme. In particular, a case study should be piloted by WMD on watershed services for hydropower production in order to establish the value of vegetation cover and forests for stream flow and reducing soil erosion and sedimentation.

- Although, PES schemes are not innately meant to reduce poverty, there can be important synergies when program design is well thought out and local conditions are favourable. The three existing PES schemes are not designed for pro-poor objectives as site selection was only based on the importance of the ecosystem services (drinking water) and availability of ES providers (Community forest groups) and ES buyers (townships and industries, hotels) who were readily agreeable to pay for the services. However, given that poverty is the main goal of development policy and objectives, there should be a conscious effort to integrate pro-poor outcomes, including benefit sharing based on equity and gender analysis. There is scope in Bhutan to consider for PES selection, those Gewogs and Dzongkhags with high poverty incidence as for example indicated by those villages under the Rural Economy Advancement Program (REAP) Programme(GNHC 2014).

3 Global experiences on PES

This section looks at the PES experiences from other countries, to provide policy recommendations to the scaling up and expansion of PES and/or similar instruments in Bhutan. It focuses on:

- three programmes that make direct transfers to landowners, on the condition of them carrying out environmental works in their land (China, Costa Rica, Mexico),
- one programme which rewards communities to engage in conservation through a series of incentives which includes a PES transfer at household level (Brazil)
- two examples of programmes in India and South Africa that use conditional transfers for public works, providing jobs for landless and/or vulnerable people.

3.1 China Sloping Lands Conversion Programme

The SLC programme is the largest PES initiative in the world. It has been running since 1999 and has invested US$69 billion during that time. The main aim has been to reduce soil and water erosion by directly targeting and converting marginal farmland into forest or grasslands (over 15 million hectares covered by 2015). The poverty alleviation component has benefited 32 million households in 25 provinces, who receive subsidies and seedlings, as well as benefiting from the promotion of off-farm employment. New strategies to improve its poverty reduction impact include targeting the most disadvantaged communities and individuals using socio-economic indicators such as regional differences in income; as well as parallel programmes promoting off-farm employment to absorb displaced labours as land is “retired” for conversion. Activities include promoting agro-forestry and intensification in remaining lands.

This programme has gone through four main phases of implementation, where the mix of instruments and forms of targeting have varied depending on the problems and the political environment affecting the programme.

The SLP programme sits under the National Development and Reform Commission (NDRC). Participation is voluntary and households apply directly to join. Implementation takes place through the State Forestry Administration (SFA), and the finances of the programme are under the management of the Ministry of Finance. Following target decisions, the SFA distributes the retirement quotas to the provincial governments, who allocate them to the counties, townships and finally, to the households. Local governments are responsible for meeting the targets set by the SFA and their responsibilities include allocating the quotas, targeting the enrolled areas, determining the participants, distributing payments, providing technical support and monitoring the programme’s outcomes.

Phase	Details
Phase I: the pilot phase (1999-2001)	The programme was first piloted in 1999 in the three provinces of Sichuan, Shaanxi, and Guansu with 381,500 ha of sloping lands converted to forest lands. The pilot areas were expanded to more provinces in the following years.
Phase II: full implementation (2002-2007)	The programme was expanded to up to 25 provinces gradually from 2002 forward. About 14.67 million ha of farmland had been converted to forestland (9 million ha) or grassland (5.67 million ha) during the period. It involved 32 million households and 124 million rural people. The payments were in grains during 2002-2004, and have been in cash since 2005.
Phase III: retreat phase (2008-2014)	There were no new conversions and the payment rate was cut by half for the already converted lands. The payment rate in Phase II was 100 kg of grains per mu per year for 8 years for conversion of croplands to ecological forest lands in the Yellow River Basin, which was equivalent to US$260/ha/yr, plus tree seedlings. The rate was cut by half to be US$130/ha/yr. The other half of funds were invested in livelihood support activities for the households who converted their lands to non-farmland.
Phase IV: new round (2015-2020).	An additional 2.8 million ha of cropland will be converted to forestland or grassland during this period. The target areas will be i) poor areas; and ii) sloping crop lands with 15-25 degree of gradient in the water source areas or crop lands with more than 25 degree of gradient in non-water-source areas. Poverty alleviation was explicitly added to the Programme's objectives.

Table 6. The Sloping Lands Conversion Programme in PRC

Source: (Jin et al. 2017)

3.2 Costa Rican PES Programme

This government-led PES programme bundles the provision of four main ecosystem services: carbon sequestration, biodiversity protection, water regulation, and landscape beauty. The programme makes direct cash transfers to private landowners for 5-years contracts for forest protection, reforestation, sustainable forest management and agroforestry. Following results from a "conservation gap" analysis (forests with no protection at risk of change) the programme will focus on protecting these areas and improve connectivity between forests through biological corridors. Apart from giving priority to indigenous communities, the social focus of the programme is more as an added-on component that uses a priority filter for applications located in areas with low development index.

Created by Law in 1996, the programme is a mix of rulesand regulations (e.g. it is forbidden to cut primary forest) and rewards that invite stakeholders to respond to incentives and disincentives. The legal underpinning establishes the structure by which the PES programme secures funding, how it is managed, and who is eligible to participate (see Figure 3).

Funding comes mostly from domestic sources through a combination of instruments:

1) Fuel tax (initially as a percentage of collection and now a fix annual amount) –linked to carbon emissions (average US$11.6m per year)

2) Water tax. Early one-to-one watershed agreements with hydroelectric companies gave way in 2006 to an allocation from water fees (25 per cent of collected revenue goes to PES, and 25 per cent to public parks and conservation areas). Average revenues US$3.6m between 2007 and the first half of 2010.
3) Agreements with private and semi-private companies interested in promoting forest protectionfor water protection, biodiversity conservation or landscape beauty in their areas (e.g. tourism sector, conservation groups).
4) Loans – for example two main loans from the World Bank to kick-start the programme, combined with some smaller grants mostly at the start of the programme (e.g. from KFW and GEF).

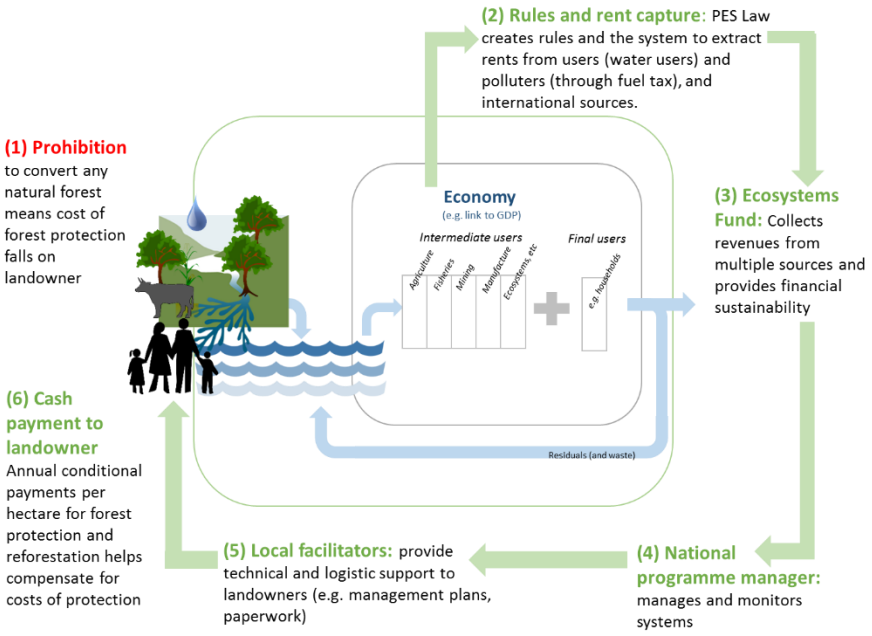


Figure 3. The legal 'backbone' of the Costa Rican PES.

The Costa Rican State has a constitutional obligation to protect the wellbeing of its people, including providing a healthy environment. Forest Law 7575 is anchored in this principle, and provides the backbone of the PES programme.

Source: (Porras et al. 2016a)

Eligibility criteria (a combination of environmental and social criteria) is published annually. Those who meet the criteria must present a forest management plan – validated by a registered forest technician, satellite photos of their property, and complete several administrative processes. Farmers can pay an intermediate organisation to help with the application –an average charge of 18% of the PES received.

3.3 Mexico PES-H Programme (focus on hydrological services)

Ongoing since 2003, this government-led programme focus on hydrological benefits provided by natural forest ecosystems. It works parallel to other programme that focus on carbon, biodiversity and agro-forestry services).

Funds from the federal government (about US$307 million between 2003 and 2009) are channelled to the *Fondo Forestal Mexicano* (Mexican Forest Fund), managed by CONAFOR (National Forestry Commission), which redistributes this funding to various uses including PES. An additional Fund-Matching Scheme encourages contributions from

local stakeholders (local governments and private sector). These funds are vital for the long-term viability of the programme, but also to ensure local targeting.

According to its mandate, the programme should act as a social safeguard, ensuring that economically vulnerable groups can take part. It seeks to empower landowners by promoting and strengthening their technical and organisational capacities. Criteria for eligibility is updated regularly – see Table 7. Not all criteria must be fulfilled but a combination of them Is possible.

The programme's operational rules design CONAFOR as the entity that provides capacity and technical assistance to participating landowners. The participants design Best Management Practice programmes, and all of them must agree to perform a series of mandatory conservation activities (there are also some optional ones). Payments are made in cash, and they target individual private landowners and community managed properties (known as "*ejidos"*in Mexico). On communal lands, contracts are signed with the *ejido* board, which decides how to distribute the money internally. There are suggestions of a bias towards paying those who already engage in good practices, but not those who deforest the land (such as cattle ranchers), suggesting limitations to additionality.

Water (PSA-H)	Forest (PSA-B)
• Property has a certain percentage of forest cover • Property found within a Natural Protected Area; within the limits of the 60 Priority Mountains; upstream from a population centre of 5,000 inhabitants or more; within a high deforestation-risk area; in a high water-scarcity area; in a marginalised locality; within the recharge zone of an overexploited aquifer • Property found in a municipality with an indigenous majority • Property has an existing contract with an ecosystem service user	• Property has forests with good conservation status • Property located in the buffer zone of a protected area • Property includes species at risk of extinction • Applicants are not receiving support from any other PES • Must show that PES activities are additional • Applicants belong to an ethnic group with a high level of social marginalisation • Requires proof of either a forest management plan, an environmental management unit, or commitment to the project through a local assembly act

Table 7. Criteria for selecting areas for PSAH and PASB

Source: (Muñoz-Piña et al. 2008, Corbera et al. 2009)

3.4 Hybrid model: Bolsa Floresta in Brazil

Bolsa Floresta is a "hybrid" model, similar to integrated conservation development programmes but adding a PES component. It is a government-private sector partnership, managed by the Sustainable Amazonas Foundation (FAS), a private Brazilian non-governmental organization.

A significant proportion of the funding comes from the Bradesco Bank and the Amazon Fund (created by the Brazilian National Development Bank BNDES/Government of Norway). Almost 80% of FAS is from private sources, which include Coca-Cola, Samsung,

Abril Media Group and Marriott International. It works as a REDD+ project, selling voluntary over-the-counter carbon offsets.

With a clear social mandate to conserve the Amazonian forest and improve the welfare of its residents, the programme now works in 15 sustainable development reserves of the State of Amazonas. It is strongly grounded on several laws that define the FAS mandate and activities. This programme is characterised by strong local involvement, a major achievement given the remoteness of some of the communities. This remoteness also means that in some cases, FAS is the main provider of some otherwise public benefits such as infrastructure or technical support. Because of that, incentives include a mix of cash and in-kind, group and individual benefits. Incentives are conditional on a series of pre-agreed activities (Table 8)that reflect a mix of environmental and social objectives. The cash component has a strong gender focus and has been particularly welcome. Payments are made to the women of the household and deposited to a bank account in their name. This means ready cash when the family visits the town to buy home or school supplies.

Indicator	Description
Management plans	Comply with the rules of the reserve management plan. For example, in Juma SDR: "establish preservation, extensive-use and intensive-use zones (ca. 123,000 ha or 21% of the reserve) in the reserve. Defines use intensity for each zone".
Memberships	Be a member of the reserve association and regularly pay association fee
Agriculture	Maintain agricultural fields no larger than in the year when a community entered Bolsa Floresta and only convert secondary vegetation (zero net deforestation)
Children	Send children of school age to school if a school exists nearby
Fire prevention	Implement fire breaks and inform community when fire is used for land preparation

Table 8. Operational rules for Bolsa Floresta, Brazil.

Source(Börner et al. 2013, Bakkegaard and Wunder 2014)

3.5 Public environmental works in India

The Mahatma Gandhi Rural Employment Guarantee Act (MGREGA) is the world's largest works-based social protection scheme, implemented in rural India since 2006(Kaur et al. 2017). It is backed by Law, which has been instrumental in securing financial resources and permanence. It aims at enhancing livelihood security by providing at least 100 days of guaranteed wage employment, some of which is used for natural resource management (mostly watershed-related projects).

Funding for the programme comes from Central and State governments. Central government covers the full cost of the unskilled wages, and 75% of the costs for materials and skilled/semi-skilled workers and administrative expenses. State governments cover the remaining 25% of the costs and share some of the administrative costs. The Ministry has stressed the creation of State Employment Guarantee Funds (SEGFs), to ensure long-term funding for the programme.

The programme is self-targeting: households enrol themselves in the programme. Registration takes place at household level. Adult members eligible for employment are issued a job card which is presented when applying for work. Employment is in theory guaranteed within 15 days of application and within 5 km of the village (10% additional is paid if further away), although in case of administrative rationing some may be denied jobs. Payments are made weekly or fortnightly, through banks/post office beneficiary accounts. The financial inclusion from these measures are impressive: nearly 90.3 million accounts have been opened under the programme, bringing the poor into the organised financial sector and in some cases providing them with better access to credit(Government of India 2014).

MGNREGA Public works investments in soil and water conservation include water harvesting, small-scale irrigation, water supply schemes, afforestation, rural infrastructure development and social services. Almost 53% of the works are linked to soil and water conservation. Several studies have looked at the impact of these works. For example, a study in Karnataka (2011)suggests that the programme provided "multiple environmental services and reduced vulnerability, apart from providing employment and income to rural communities". The main impacts included better groundwater recharge, water percolation, more water storage in tanks, increased soil fertility, reclamation of degraded lands and carbon sequestration. The improvement in the resource base had positive impacts on agriculture, for example through increased crop and livestock production. A study by the Institute for Human Development of 1000 randomly selected dug wells showed 70 to 80 percent completion, and high levels of use especially to grow vegetables and domestic and husbandry use. From these figures, the study suggests a 6% social return rate in real terms(Dreze 2015).

3.6 South Africa's Working for Environmental public works scheme

This government-led programme has its roots in the 1995 Working for Water(WfW) programme, which actively linked the Government's objectives of poverty relief to executing environmental improvements. Since then the programme has evolved to target other ecosystems (such as wetlands, coastal protection, and fire prevention), and all environmental management programmes working in coordination under the environmental and social cluster of the Expanded Public Works Programme umbrella. The programme created 95,000 job opportunities between 2015 and 2016, half of which were for women.

The activities promoted address the threats to the productive use of land and water, and the functioning of natural systems, specifically by managing invasive alien species, wild fires and land and wetland degradation, as well as providing opportunities for value-added industries (including fibre and furniture production) whilst ensuring meaningful livelihood opportunities are supported for those employed in doing this work.

Table 9. Evaluation criteria for project selections in "Working for" programme in South Africa

Ecosystem service providers		Ecosystem service benefits	
Criteria	**Description**	**Criteria**	**Description**
Local Poverty & Unemployment	Preference to applications in areas where there are relatively higher numbers of poor and/or unemployed people	**Water Flow Demand**	Dependence on the natural environment for water resources; Oversubscribed catchments
Local Household Income	Preference to applications in areas with proportionally higher numbers of households with lower income	**Water quality**	Where applications can ameliorate the impact of point and diffuse pollution of water resources.
Mean Living Level of Income	Preference to applications with high proportions of low mean living levels of income as these are areas where people live below the food poverty line.	**Existing EPWP Projects Distribution**	Spatial representation of where existing EPWP projects are active
Direct dependence on ecosystems	Preference to applications in areas where there are relatively more households relying on the natural environment.	**Spatial Biodiversity Priorities**	Critical Biodiversity Areas and Ecological Support Areas as identified in systematic biodiversity plans/bioregional plans (Provincial and Metro).
Protection Status of the Land	Landscapes with some level of protection get preference over areas with little or no protection of land for biodiversity conservation.	**Fire Management & Risk Reduction**	Vulnerability of people to fire; and potential impact of fire on livelihoods.
Invasive Alien Species Infestation Levels	Preference to catchments that have higher proportions of area susceptible to alien species invasion, subject to the environmental impact of the infestation.	**Security of NRM investment**	Applications that demonstrate higher security for the natural resource management investment are favoured
Wetlands/River Health & Condition	Preference to wetlands and rivers where good ecological condition can be maintained; or systems in fair condition can be improved.	**Fire Risk and vulnerability**	Addressing Ecological factors that influence fire hazard and (fire frequency/load/intensity)
Ecological Infrastructure in the landscape	Areas of biodiversity importance that should be prioritised for NRM investment for improving landscape/catchment ecological condition.	**Water supply**	Landscapes ensuring water supply for human use will be used as an evaluation criterion.
Climate Change Mitigation	Preference to applications that occur in areas with high potential for carbon sequestration	**Erosion Control**	Improvement in catchment condition to reduce sedimentation or addresses impacts related to erosion.
Climate Change Adaptation	Preference to areas that provide ecosystem based adaptation support (e.g. storm surge protection areas for rivers and the coast, ecological process corridors for landscape connectivity, etc.).		

Source: (Marais and Mlilo 2017)

Most of the funding comes through the poverty relief budget. There have been some efforts to enlarge the pool of financial contributions, for example water users through the government's water management fees or through individual regular donations. The Department of Environmental Affairs is trying to further engagement with private and municipal stakeholders and state-owned utilities in catchments infested with invasive plants, or in need of restoration.

Implementation has evolved through the years, from a programmatic approach with near total control in the hands of the central government towards a sector development

approach.Funding is transferred to implementing agents (AI, see Table 10), both national and local.

Category	Description
Category 1	Public entities (both National and provincial) established by the government of the Republic of South Africa
Category 2	Entities such as (but not limited to) Community Trusts, Non-Governmental Organizations and Cooperatives
Category 3	Educational institutions
Category 4	Public and Private Entities which represent business enterprises established in terms of applicable South African laws

Table 10. Types of implementation agencies in "Working for" Environmental programme in South Africa.

Source (Marais and Mlilo 2017)

To date, the private sector has been slow in working directly with the government, and the most common reasons for this are fear of voluntary participation turning into regulations and forced participation, government inefficiencies and ideological differences.

CBOs and NGOs are also used to overcome some of these differences and engage with the private sector, mostly through the Land User Incentive programme (LUI). This programme uses public funds to unlock private investments and are more flexible to accommodate other requirements by co-investors. A memorandum of agreement (signed for 3 years) specify the type of contributions by each party, activities, cost per person/day and number of person days per year, overall annual plan of operations and budget and targets per financial year.

Experience so far shows that these institutions are more dynamic than local and government agents, who tend to have higher transaction costs and not target the projects adequately.

4 PES in Bhutan: lessons learned from international experience and ways forward for Bhutan

4.1 Specific Lessons from international experience

This section reviews the key features of the different international PES programmes and their lessons for Bhutan.

China Sloping Land Programme: A number of useful lessons can be drawn from the SLCP experience, all pointing to the crucial link between the institutions, incentives, and ultimate success of a programme. Decentralization under the SLCP focused disproportionately more on distributing responsibilities than on fostering a local sense of ownership, causing the programme to expand too fast in its Phase I and first half of Phase II (1999-2005) at the cost of its budgetary burden, its democratic character and effective targeting. Recognizing the trade-offs inherent between scale and targeting, the critical importance of the latter should not be understated, as revealed by its connection with the SLCP's unintended, negative impacts on the environment (i.e. water shortages, decreased biodiversity) and local livelihoods (i.e. lower incomes, higher inequality). Implementation, including compensation, should be sensitive to local heterogeneity and be guided by a management strategy that is flexible, inclusive and responsive to feedback. Beyond implementation, scaling up a program of such magnitude requires a strong focus on the initial phases of planning, demonstration and piloting, as well as on strong safeguards that will maintain the programme's incentive structures long after its implementation and thus guarantee its long-term success. Some of the lessons learned from the previous phases of the Programme have been used to re-shape the Programme in the later phase. For example, in the latest Phase IV of Programme the targeting is emphasized so that only those who are poor, willing to convert and whose crop lands are steep slope (25 degree in one circumstance, and 15-25 degree in another) in the project areas could join the Programme. Adaptive management of the Programme is vital for its success. But independent monitoring and evaluation is still absent which might undermine its adaptive capacity in the long run.

Costa Rica, PES: This is the first national level programme making direct cash rewards for ecosystem services. Its legal foundations allow it to access a variety of funds, from Government allocations to deals with the private sector (national and international). Despite this, the programme remains over-subscribed and under-funded. The programme uses preference criteria to allocate contracts, published annually as ways to target participants and reach their objectives. This introduces flexibility in the design and the ability to take feedback. The programme does not have an explicit social

component. Most owners of land in Costa Rica are relatively better off than those without land. Within this group however, the emphasis on protection contracts further excludes those who derive livelihoods from their land (absolute protection is required). Despite being oversubscribed, land prices in Costa Rica are generally increasing, reducing the competitiveness of the PES transfer in those places where forests is most at risk of change. PES needs to work stronger with other mechanisms and regulations and improve their target areas where the payment can make a change in behaviour.

Mexico PES: Long-term programme, with clear sources of income based on legal mandate, and clear operational rules that promote accountability. The programme has been adapting along the way, and currently it shows better emphasis on targeting improved programmes' environmental impacts – at least in terms of reaching areas more at risk of deforestation. The programme works in private and communal lands (ejidos). In communal lands, contracts are signed with the ejido board which decides how to distribute the money internally. There is suggestion that there is a bias to pay for those who already engage in good practices but not with those deforesting (e.g. cattle ranchers) suggesting limitations to additionality. The introduction of social benefits was a requirement to make the programme politically acceptable, even if it led to trade-offs. There is contradictory evidence in Mexico on trade-offs: some show that it is possible to reach social and environmental, and others that linking them may lead to achieving none. The programme also provides useful lessons on how to combine national goals with local priorities, and how to adjust the instrument design to respond to the needs of local economies and the provision of environmental services.

Brazil, Bolsa Floresta PES/ICDP: The programme has been effective in securing multiple sources of funding, strong presence of the government, private sector and international initiatives like REDD+. Having a private non-government organisation running the programme promotes effectiveness in management and reduces red tape common in government programmes. The transaction, operational and monitoring costs are still very high, because of the remoteness. Significant efforts are made to include local communities in monitoring and taking responsibility of the programme. Due to the low pre-intervention pressures on forests locally, the additional environmental effect of the programme has by definition been small: not much more deforestation would likely have happened without the programme. By itself, Bolsa Floresta is not designed to be a source of income for families, but rather a reward for forest conservation. However, although the cash payment was initially intended to be small and probably temporary, it is reported by beneficiaries as one of the most important public benefits they receive. According to Bakkergaard and Wunder(2016)the mix of benefits (health, education and sustainable livelihoods) could do more than cash payments to improve lives in the market-remote recipient communities. By targeting remote communities, with little access to markets and opportunities, and deficient public-sector service provision, the programme has important social benefits. Although cash transfers have been used in Brazil for many years – for example retirement pensions and transfers for family wellbeing ('Bolsa Familia'). Transfers for forest stewardship are newer. The replication

of low-value, uniform per household transfer as in Bolsa Floresta may be more challenging in settings where more competition for land use exist(Börner et al. 2013).

Public works: The Mahatma Gandhi Rural Employment Guarantee Act (MGREGA), India

Key lessons from the programme are:

- The legal backing of the scheme has ensured political attention and adequate budgetary allocation since its inception.
- Strong MIS key to success of such a large-scale programme
- Direct payment to bank accounts of beneficiaries reduces leakages and supports financial inclusion
- ICT infrastructure plays important role in making the implementation process effective.

Durable, climate resilient and livelihood-linked assets in addition to wage guarantee provides holistic safety net to poor households and enable them to be more resilient to weather and other livelihood risks.

Public works: "Working for" environmental programme, South Africa: The Environmental Programmes umbrella programme has been very effective in combining environmental and socio-economic objectives by providing jobs to people. The focus on investment in ecosystem services follows a sector development rather than programmatic approach. By using different individual components (WfWater, WfWetlands, etc) it is possible to target the specific ecosystem threat or issue, while using a similar social development model to provide social benefits. The programme has many biophysical and hydrological studies underpinning the operations.

One of the main constraints of the WfWater programme for example is securing sustained control of IAPs in cleared areas. This requires on-going follow-up or handover of land to landowners; it is unclear whether, once the land has been cleared, the landowners feel a greater obligation to maintain the land and prevent future infestation of IAPs.

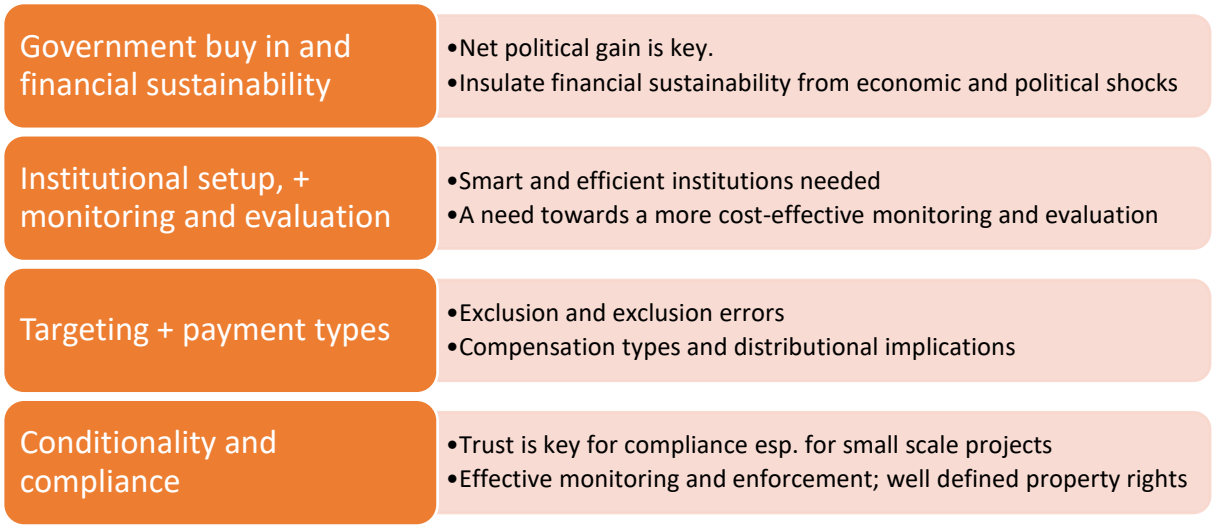
Given that the programme is government-led, the bureaucratic process often results in delays in payments and contract approvals, which can be especially harmful for the vulnerable groups with which the programme works.

4.2 Generic Lessons from international experience

Over the past 15 years we have seen a rise in the number of PES projects around the world. In this section we discuss several design elements that have enabled some of these projects to succeed (Porras et al. 2016b), in terms of 1) the programme manages to operate at large scales – preferably at national level; 2) the programme results in better livelihoods for vulnerable/poorer members of the society; and 3) the programme

has positive environmental outcomes. A review of key programmes, suggest several enabling conditions for successful PES schemes:

Figure 1: Enabling conditions for successful PES programmes



Possible areas of convergence

While the 8 interventions set out above have distinct characteristics with respect to their scope and design features, they also shared some important characteristics. The similarities were teased out by assessing both the opportunities they offer and the challenges they face. These are summarised in the table below:

Opportunities	**Challenges**
Encouraging evidence on positive social and ecological impacts in all cases	Most of the schemes suffer from targeting errors which can broadly be defined as inclusion and exclusion errors; and subsequently elite capture
Use of information, communication and technologies (ICTs) to reduce cost of monitoring and evaluation	divergence between preferred and actual compensation packages undermines effectiveness
Private sector engagement to ensure financial sustainability	Rampant freeriding and limited capacities for effective policing and compliance
Observed behavioural change and enhanced resilience	Lack of clear exit strategy or ability to graduate from the programmes.

Direct intervention versus behavioural changes

We discussed two specific conditional transfers: a) programmes that seek to change behaviour using incentives like PES in Mexico and eco-compensations in China, and b) programmes that implement direct interventions to improve or restore ecosystems by employing poor and vulnerable people –as in South Africa, Ethiopia and India. There are good lessons and also potential to improve. Direct interventions are effective in reaching poor people and on providing discrete environmental 'fixes' but are less effective in long-term environmental management. Incentives, on the other hand, seek to change the long-term behaviour but can be less effective in the short-term, and often struggle to include the very poor and/or landless.

Combining ecological and social objectives

It is widely recognised that PES and CSTs programmes often (if not always) focus on ecological or social outcomes respectively. Extensive discussion was held whether there is a merit in aiming to achieve both ecological and social outcomes by combining the two interventions and developing a hybrid model. Some of the pros and cons of such approach can be summarised as follows:

Table 11. Combining social and ecological objectives: pros and cons

Pros of combining ecological and social objectives	Cons of combining ecological and social objectives
Poverty and environment are strongly interlinked. Poor communities are disproportionately more reliant on ecosystem services	Poor communities are not necessarily located where there are critical environmental issues (or vice versa).
Social protection programmes have more political buy in (relative to PES)	Adding ecological component could potentially lead to rent-seeking behaviours or "green-grabs" in the name of conservation to the exclusion of local communities.
Adding ecological component to existing social programmes could mean more cost-effectiveness and efficiency in achieving both ecological and social outcomes.	Adding ecological component to CSTs will certainly involve some trade off – which could be resented by the target population and endanger the legitimacy of the scheme.

Food or cash?

PES schemes also differ on the types of food or cash payments and both have pros and cons. Which there has been extensive work done to assess the impacts of food and cash compensations, their context specific nature means they remain unresolved. Therefore, it is critical to continue doing more research to assess the impacts of the type of compensation in different contexts. The pros and cons discussed can be summarised as follows:

- *Pro-food, con-cash*
    - If carefully selected, certain food types may have a distributional impact by increasing nutritional intakes by women and children
    - Cash is more susceptible to unproductive consumption, usually by male household heads (eg for alcohol)
    - Cash suffers from inflationary pressure whereas food transfers do not
- *Pro-cash, con-food*
    - Food transfers incur high administrative and distribution costs compared with cash transfers
    - In-kind transfers in general and food in particular could encroach upon consumers' ability to purchase anything they wish.

4.3 Ways forward for Bhutan

Based on the experiences gained from implementing the three drinking water PES schemes in Bhutan and relating them to how PES innovations are taking place worldwide, the following ways forwards for Bhutan are suggested:

- **The limited drinking water PES schemes in Bhutan have had some success, but do not provide a viable foundation for upscaling to a national level programme**: The present pilot PES schemes are limited to drinking water in three small watersheds involving a small group of Community Forest (CF) communities. While there are options to replicate drinking water PES in other parts of Bhutan, experience so far has shown that these schemes are costly in terms of upfront costs and preparatory time of setting up the schemes. These costs could be reduced by linking with community forests and Integrated Community Development programs (ICDPs) as the institutional set-up and social mobilization arrangement pre-exist in these programs (Norbu 2012). The other challenge is that unlike the national PES schemes developing in other countries, these three pilot drinking water schemes remain site specific schemes where all the arrangements need to be negotiated on a basin by basin level.

- **Perhaps the most promising way to upscale PES is through protection of forests and wetlands to regulate hydrological flow and to control soil erosion to enhance water quality production for hydropower plants**(see box 2 for how this could work).This was initially set out in the 2008 Hydropower policy but has recently received a push as in early 2017 the Ministry of Economic Affairs has been tasked to work with Ministry of Agricultural and Forests to develop a framework to operationalise the scheme to reinvest a share of the hydropower royalty in watershed management. It is estimated that in 2015 a share of 1% of the 15% hydropower royalties would be equal to 10 million Nu or about the current budget of WMD through RGoB funding and about 9% of WMD budget if we consider funding from external sources. These royalties are set to triple in the next three years and then further increase with future hydro developments so they could make a major contribution to the WMD budget. Payments could go via the Government budget of the Ministry of Finance or through a Trust Fund such as the Bhutan Trust Fund for Environment or be paid direct from the Druk Green Power Corporation.
- **WMD will outline the approach for PES to be applied on watershed services for hydropower production in the Wangchhu Basin** where 80% of the current hydropower capacity is installed, where the two main urban centres of Thimpu and Paro are located and where the pressure on forests is therefore greatest. To do this WMD will undertake an ecosystem valuation of the Wangchhu Basin to generate useful information to identify the monetary values the can drive a PES scheme. This will involve both developing and running ecosystem models and collecting field data on key hydrological parameters. This will be funded by the World Bank REDD+ programme.

Box 2. Potential application of a watershed PES system in Bhutan. A concept note[1]

The Hydropower Development Policy 2008 supports that a minimum of 1% of the sale of hydro power in Bhutan could be put into some form of "watershed management fund" that could be used for upstream watershed management activities likely to benefit downstream water quality and quantity. However, the modalities for distributing the money and accounting for its use have yet to be determined. Its application to watershed management activities would seem to be a logical fit, subject to negotiation of the modalities for administering the fund and in particular, identifying those activities that lead directly to the provision of the service, and the conditionality (i.e. defining the conditions against which service provision will be judged). Nonetheless, it is useful to develop a conceptual approach for a watershed PES system suitable for application in Bhutan. Following the outline used by Wunder 2013, the following basic framework could apply.

1. The *service* to be provided is a clean, well regulated water supply to the hydro power stations.
2. The *purchaser* of the service is Druk Green Power Corporation.
3. The *providers* of the service are upstream land owners whose land management practices can influence the provision of the service.

The Watershed Management Division (WMD) could act as an intermediary between the purchaser (Druk Green Power) and the providers (upland land managers). Its role would be to: Identify those land management practices that could contribute to the provision of the service (initially in critical parts of critical watersheds). Prepare contractual agreements with the landholders (or groups of landholders) for the provision of the services (by specifying activities, quality standards and timelines).

- Transfer payments to the landholders subject to compliance agreements.
- Carry out compliance monitoring to ensure that the agreed activities are being carried out.
- Report to the purchaser of the service (Druk Green Power) on the compliance and on overall outcomes and impacts.

However, there are many practical difficulties associated with operationalizing such a system. Establishing direct link between a clean well-regulated water supply at a hydro power station and upland land management requires careful modelling with remote sending and field equipment. But WMD is now embarking on such an approach to have the relevant evidence available.

- **Already the Druk Green Power pays directly for upstream afforestation** in some of its watersheds and this form of direct payments could be expanded.

- **The other option for a national PES scheme would be based on some share of foreign tourist revenues** as currently 18% of non-regional foreign tourists come to Bhutan for nature-based activities (TCB, 2017). Even cultural sites such as the Tigers Nest benefit from forests to make the hike up more scenic and shaded. Currently tourists pay for some protected areas and some cultural sites and this could be reinvested in watershed management.

- **PES could be increased in Bhutan by bundling different services as done in Costa Rica.**Bundling of different ecosystem services is recommended by the Field Documentation Report (2015) and Ojha *el al.* (2005)to generate different services from the same parcel of land and sell to single buyer or a consortium of

[1]Extracted and adapted from a Draft Report prepared by WMD (Gilmour) 2016 **Annex 2 : Approaches to payment for environmental services (PES), including REDD+, and its relevance for Bhutan-** for Washed Management Manual, WMD, DOFPS

buyers to avoid trade-offs. For example, water quality, biodiversity, and visitor benefits could be bundled together. With time and more experience gained in PES implementation, WMD would consider bundling various ecosystem services in the selected critical watersheds in Bhutan.

- **The experiences from three PES schemes show that ES users are the most important stakeholders for sustainably of the PES scheme**. Therefore, WMD will continue dialogue with different potential stakeholders for evaluating the current and potential demand and willingness to pay for services. ES users for Biodiversity Conservation PES can be the national organisations such as Tourism Council of Bhutan and Bhutan Trust Fund for Environment Conservation and international organizations involved in Biodiversity conservation such as WWF, and IUCN. Druk Green Power Corporation is the potential ES user to start a mutually beneficial PES for watershed protection service.

- **The opportunities for PES to contribute to benefit sharing and reducing poverty, besides environment conservation, are great, particularly to address human wildlife conflict**, as PES is being recognized and respected by existing policies, laws and institutions. However, it is too early to arrive at conclusive results on the likely poverty impacts of PES schemes as the present experiences on PES implementation are limited to small-scale schemes and to a single PES type-e.g. drinking water scheme in CF. Also, the present PES schemes are not designed particularly for poverty alleviation and enhancing the rural economy. In order to gain more insights into PES and make PES more poor- focused, the approach should be to implement PES in the Dzongkhags and Gewogs where poverty is a challenge preferably under REAP program. Biodiversity Conservation PES can also address the national issue of human wildlife conflict on crops and domestic animals that has a major bearing on the national goal of poverty reduction and food security.

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