



CORDILLERA STUDIES CENTER UNIVERSITY OF THE PHILIPPINES BAGUIO



UNIVERSITY OF THE PHILIPPINES CENTER FOR INTEGRATIVE AND DEVELOPMENT STUDIES Local-Regional Studies Network Cordillera Studies Center

UP CIDS DISCUSSION PAPER 2019-12

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ISSN 2619-7448 (PRINT) ISSN 2619-7456 (ONLINE)



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# Exploring a Private-led Payment for Environmental Services (PES) Scheme in Mount Pulag Subwatershed

CORAZON L. ABANSI<sup>1</sup>

### ABSTRACT

Payment for environmental services (PES) as an economic instrument to promote conservation and poverty reduction goals is relatively young in the Philippines. One of the earlier applications of PES in the country is on watershed services to support hydropower generation, and this is dominantly government-led. This paper analyzes the potential of developing a private-led PES scheme for hydrological services in the Eddet–Bashoy–Ekip Subwatershed of Mt. Pulag National Park. A combination of focus group discussions, key informant interviews, secondary data gathering, and case analysis comprise the methods of the study.

Government-led PES schemes in hydropower generation in the Cordillera Administrative Region are evident in run-of-river type and reservoir-based operations. Guided by the Electric Power Industry Reform Act, the socio-economic and environmental benefits from these schemes are confined to host communities. The nature of hydrological services in the Mt. Pulag Subwatershed in the Cordillera Region indicates that activities in communities beyond the hosts affect the operation of a reservoir-operated hydropower plant in the site, suggesting the need for a privateled PES scheme. The critical elements of this scheme in terms of the defined environmental service, buyer of the service,

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#### **2** ABANSI

supplier of the service, and conditionality or payment are already present in the subwatershed. More importantly, this hydropower company is willing and ready to enter into a PES scheme with the indigenous communities as part of its broader corporate social responsibility program that considers voluntary payments over and above payments to host communities. Recommendations for a successful PES scheme include harmonizing tenure arrangements given the plurality of tenure instruments in the area, conducting readiness and capability-building activities for PES participants, and strengthening research to address data gaps on hydrological attributes and soil erosion.

#### **KEYWORDS**

Payment for environmental services (PES), positive externalities, hydropower generation, indigenous communities, watershed management, Mt. Pulag National Park

#### Introduction/background

Payment for environmental services (PES) is an innovative mechanism to secure and improve the provision of ecosystem goods and services using a market-based mechanism that ensures the transfer of financial resources from beneficiaries of environmental services to those who provide these services, thus internalizing the benefits and creating the missing incentives for the provision of environmental services (Mayrand and Paquin 2004). It is not a new concept as it has been practiced since the 1880s (Van Noordwijk et al. 2012; Dunn 2011). Over time, the application of the concept has taken diverse forms depending on the context, but in general, PES schemes are increasingly recognized as effective mechanisms that address market failure by altering the economic incentives of resource owners and land managers (Farley and Costanza 2010; Wunder, Engel, and Pagiola 2008; Landell-Mills and Porras 2002).

As an economic instrument to promote conservation and poverty reduction goals, PES is relatively young in the Philippines. In the Cordillera Region of Northern Philippines, earlier applications of PES address recreational services from landscape beauty and hydrological services for hydropower generation. Although it is recognized that a market-based PES scheme is efficient in allocating benefits from ecosystem services (He and Lang 2015; Wunder 2007; Georgieva, Pagiola, and Deeks 2003), PES programs in the Cordillera Region are dominantly catalyzed and led by government. This is because the legal and institutional framework supporting PES schemes are not yet in place and stakeholder capacity is relatively weak. The present institutional arrangements neither efficiently nor judiciously function to make upland communities in the Philippines share in the benefits, rewards, and incentives from environmental services that they provide. Boquiren (2005) conducted a review of the institutional environment, mechanisms, and processes related to the provision of environmental services and found out that key policy enactments only approximate the broad objectives of PES which are ecosystem conservation and protection, revenue generation, and poverty alleviation. Given this scenario, government has to take the role of seller, buyer, and/or enabler/intermediary to facilitate transactions and at the same time minimize the costs of transactions (Scherr and Bennet 2011). While the government has been instrumental in initiating PES schemes, exclusive government control of ecosystem services markets risks crowding out potentially significant sources of conservation finance from non-government economic actors and dampening incentives for innovation in these payment schemes.

This research aims to probe the readiness of the Cordillera Region to move from publicly-initiated PES schemes to privatedriven demand for ecosystem services. Specifically, it investigates the potential of a private-led PES scheme in a subwatershed in Mt. Pulag National Park (MPNP). Private sector companies are among the important users of water-related services (Mulder, Kate, and Scherr 2006; Georgieva, Pagiola, and Deeks 2003). Do, Vu, Nguyen, and Catacutan (2018) shared that although private sector voluntary engagement is currently lacking, it is interested and willing to pay for environmental service (ES). Since the target partner for the PES scheme is a hydropower plant, the study focused on hydrological services as the object of PES. Further, since a PES scheme is sitespecific (McGinnis 1995), this research delimits the site to the Eddet– Bashoy-Ekip Subwatershed, with the optimism that the process can be replicated in other communities in Mt. Pulag.

The importance of Mt. Pulag cannot be overemphasized being the third highest peak in the Philippines (Fernando and Cereno 2010) and one of the 29 key priority areas for development, management, and protection in the country. Mt. Pulag National Park has a large diversity of flora and fauna, many of which are endemic to the mountain. It is an important watershed providing water for domestic and industrial use, irrigation, and aquaculture in many parts of Northern and Central Luzon (DENR-NIPAP 2000, cited in Fernando and Cereno 2010). More importantly, it provides water for hydropower generation and supports four major dams such as the Ambuklao, Binga, San Roque, and Magat dams, as well as the surrounding communities. The economic importance of Mt. Pulag is obvious from its biological richness, ecotourism potentials, and support to power generation. Unprotected, it is prone to threats of expansion and encroachment of agricultural farms, timber poaching, wildlife hunting, bioprospecting activities and piracy, unregulated tourism, and infrastructure development. Farm-to-market roads are constructed encroaching the park which may cause the loss of important flora and fauna valued for their rarity.

## **Research framework**

Payment for environmental services (PES) is a voluntary transaction in which a well-defined ES or land use likely to provide that service is bought by a buyer from a provider/seller if and only if the provider ensures the continuous provision of that service (Wunder 2007). PES is hinged on the principle that resource users and communities that provide ES should be compensated for the costs of providing these by those who benefit from the ES (Mayrand and Paquin 2004). Compensation and incentives refers to direct cash payments or payments in kind such as provision of infrastructure, livelihood support, market preferences, health and educational services, skills training, scholarship programs, technical assistance, or land tenure security given to provider/supplier of service to ensure its continuous provision. In other words, users of the ES should internalize the external benefit.

At least four conditions need to be met for a mechanism of payment for ecosystem services to occur (Porras, Grieg-Gran, and Neves 2008). First, there must be a well-defined ecosystem service where the maintenance and/or supply can be of interest for someone. Second, there must be a buyer able and willing to pay for the conservation of the specific ecosystem service. There can be multiple buyers who are the users or beneficiaries of the environmental services in a PES scheme. Third, there must be a seller/provider who receives payment in exchange for providing and maintaining the ecosystem service. Lastly, the transaction of paying and receiving for an ecosystem service should be primarily voluntary. Those involved in the transaction should participate because they want to and not because they are obligated to do so.

Wunder (2007) notes that PES has not been formally defined in the literature, but likewise offers a fifth criteria to describe the PES principle. According to him, "a PES is (1) a voluntary transaction where (2) a well-defined ES (or a land-use likely to secure that service (3) is being 'bought' by a (minimum one) ES buyer (4) from a (minimum one) ES provider (5) if and only if the ES provider secures ES provision (conditionality)" (Wunder 2005, 3). This conditionality may refer to the compensation or incentives for the ES provision.

PES programs, being market-based instruments, can be more efficient than command-and-control approaches because they concentrate on efforts with lower costs and higher benefits (Georgieva, Pagiola, and Deeks 2003). Furthermore, PES has an inherent feedback mechanism because the payment to ES providers is based on the payment from ES users, and the latter will want to make sure that their payments are used effectively. Francisco (2005) points out that it is important to link the sellers with the potential buyers. A broker or facilitator, usually the government or a non-government organization (NGO), can serve as an intermediary by facilitating the transaction between seller and buyer. Payment for ecosystem service transactions can occur in various manners (Francisco 2005). These include the following:

- (1) Private transactions where the government does not participate;
- (2) Public schemes where the government (local, state, or national) participates in the process as a buyer or intermediary in receiving and distributing the resources. Government acts as regulator and enabler to ensure an adequate and sustainable supply of public goods. In many cases, government acts as the intermediary or broker between sellers and buyers of environmental services. The government likewise provides the necessary funds for capacity-building, monitoring, and negotiations for international transactions; and
- (3) Mixed schemes in which businesses, community members, and governments are all involved.

The framework which guides this research project is illustrated in Figure 1 (on next page). The defined service is hydrological services as affected by land use of the upstream communities who will be the ES seller/provider. A hydropower plant downstream benefiting from sustainable land use upstream will be the buyer.

# Methodology

Because PES schemes are site-specific, the study site was delimited to the Eddet–Bashoy–Ekip Subwatershed, whose rivers and tributaries drain into the bigger Agno River. The river feeds into a hydroelectric power plant located downstream in Ambuklao, Bokod in Benguet Province.

A combination of focus group discussions (FGDs), key informant interview (KII), case analysis, and secondary data gathering are the main methods of the study. FGD participants are the (1) officers and technical personnel of the hydroelectric power plant which is the main



FIGURE 1 Research framework (adapted from Smith et al. 2006)

beneficiary of the positive externalities of a well-protected watershed, (2) members of the Protected Area Management Board (PAMB) of the Upper Agno in Mt. Pulag, and (3) members of the indigenous communities of Ekip in Bokod and Eddet and Bashoy in Kabayan. Two meetings with the power plant personnel were conducted. The first was held on May 3, 2018 in the power plant facility where the research project was introduced and the second was the FGD held on May 22, 2018 at the University of the Philippines Baguio. Two meetings of the PAMB were attended by the research proponent. The first was on March 19, 2018 when the data taken from secondary sources was presented and the FGD conducted, while the second was on May 29, 2018 when the results from the meetings with the power plant personnel were presented.

Interviews were also conducted with key informants consisting of the Protected Area Supervisor, technical officers and staff from the Department of Environment and Natural Resources–Provincial Environment and Natural Resources Office (DENR–PENRO) of Benguet, municipal and barangay local government officials and officers of peoples' organizations in the three communities. The FGDs, KIIs, and meetings were complemented by field visits of the three communities including the terrace vegetable farms.

#### 8 ABANSI

Secondary data were sourced from the Library and Research Office of the DENR–PENRO in Baguio City, the University of the Philippines Baguio, and the University of the Philippines Los Baños. The case study approach was also used to present the existing government-led PES schemes in the Cordillera Administrative Region (CAR) and in Mt. Pulag National Park.

## The study site

The Eddet–Bashoy–Ekip Subwatershed is located in the southernmost part of the Mount Pulag National Park (MPNP) and Upper Agno River Basin Resource Reserve covering portions of the municipalities of Bokod and Kabayan in Benguet and Kayapa in Nueva Vizcaya. Majority of the area covers the Barangay Ekip of Bokod, Benguet. The total area of the Eddet–Bashoy–Ekip Subwatershed is 2,328 hectares.

Residing in the subwatershed area are communities of indigenous peoples, particularly Kalanguya, Ibaloi, Kankanaey, and the Karaos<sup>2</sup> (DENR–NIPAP, cited in Fernando and Cereno 2010). There are two Certificates of Ancestral Domain Titles that cover portions of the Eddet–Bashoy–Ekip Subwatershed. One was awarded to the municipality of Bokod (LTI Number: CAR-BOK-0908-080) with an aggregate area of 41,223.32 hectares and the other to the municipality of Kabayan (LTI number CAR-KAB-0308-081) with an area of 22,880.86 hectares.

The forests of the Eddet–Bashoy–Ekip Subwatershed are critical to the daily activities of the residents of the three barangays and also serve as a source of water for domestic and irrigation purposes to the municipality of Bokod and to other neighboring communities. The subwatershed is also one of the entry points to two major tourism assets—Mount Pulag and Mount Purgatory. The indigenous

<sup>&</sup>lt;sup>2</sup> These groups comprise the residents not only of the sub-watershed site, but also of the MPNP in general.

communities in the area have swidden and backyard farms. However, most have shifted from the traditional gardening of sweet potatoes to the commercial farming of vegetables such as carrots and cabbages. Table 1 below shows the allocation of the area in the sub-watershed to various land uses. Likewise, Figure 2 (on next page) presents the map showing the location of the study site. The map was produced by DENR CAR and the Benguet PENRO using their 2017 GIS database.

GubWatershea		
Land use	Area (in hectares)	% total
Agricultural areas	195.32	8.36
Agroforestry areas (NGP)	9.36	0.40
Other agroforestry areas	20.30	0.87
Built-up areas/settlements	4.21	0.18
Bamboo plantations	10.40	0.45
Forest plantations (NGP)	27.26	1.17
Open forests	965.54	41.48
Closed forests	1,095.58	47.06
Total	2,328.00	100.00

 TABLE 1
 Land cover and corresponding area within the Eddet–Bashoy–Ekip

 Subwatershed
 Subwatershed

Source: Department of Environment and Natural Resources–Cordillera Administrative Region (DENR–CAR) and Benguet Provincial Environment and Natural Resources Office (PENRO) 2017 GIS database

#### Government-led PES schemes in hydropower generation

Run-of-river type hydropower generation

A PES scheme involving run-of-river hydropower generation has been implemented in Bakun and Sablan, two municipalities in Benguet. 'Run-of-river' hydropower generation works by redirecting river water through a weir into conveyance pipes towards a penstock and feeding it downhill to a power station. Providers of watershed services are paid for changes in their land management practices that have a high probability of resulting in the provision of the environmental

#### **10** ABANSI



FIGURE 2 Map showing the relative location of the study site

Source: Department of Environment and Natural Resources–Cordillera Administrative Region (DENR–CAR)

service. These come in the form of conservation of existing forests and reforestation and management, as well as improved land practices mostly through soil and water conservation techniques. Conservation practice is linked with the generation of water quality and quantity services (Arias et al. 2011). The two positive impacts of forest conservation and management—decreases in sedimentation rate and an improvement in dry season flow—are considered to be valuable ecosystem services in this PES scheme in Bakun and Sablan.

Hedcor, Incorporated buys watershed services for its hydroelectric projects in Bakun and Sablan. Hedcor is a wholly-owned subsidiary of the Aboitiz Power Corporation and specializes in generating renewable energy from run-of-river hydropower systems. Hedcor manages and operates 19 hydropower plants and supplies the country with 155 MW of clean and renewable energy. With more than 30 years of experience, Hedcor is one of the leading run-of-river developer in the Philippines. Bakun is home to three of Hedcor's hydropower plants commissioned in 1993 which tap the power of the Bakun River. The Sablan hydropower plant harnesses the power of the Balili River and is awarded with an ISO certification for quality management.

The suppliers of watershed services are two indigenous communities whose people are drawing their livelihoods from communal land. The public good characteristics of watershed services provide little incentive for landholders to consider the downstream effects of their land-use decisions, hence a facilitator or middleman facilitates the link between the buyer and provider of watershed services. In the case of Sablan, the municipal government served as the intermediary or facilitator. In Bakun, a municipal-wide grassroots organization, the Bakun Indigenous Tribe Organization (BITO) served as the middleman or facilitator. Since prices are regulated at the national level, BITO helps suppliers deal with local applications (Cremaschi, Lasco, and Delfino 2013). Where prices are determined through negotiation (at the local level), the facilitating organization creates a negotiation forum and assists the weaker party (usually the supplier) with the negotiating strategy. The linking of supply and demand for watershed services finds its practical expression in the payment mechanism, whereby the agreed amount of payment goes from the users to the providers in return for the watershed services or proxy land-based activities agreed. A national legislation in 2001, the Electric Power Industry Reform Act (EPIRA) contributed significantly to the success of linking the supply and demand for watershed services by stipulating that a levy on electricity sales must be paid to the financial benefit of the host communities. Specific benefits for Bakun and Sablan consist of (1) the statutory benefits in terms of tax payments mandated under existing government laws, and (1) the voluntary social development and livelihood assistance from the hydroelectric companies translated through memoranda of agreement (MOA).

#### Reservoir/dam-based hydropower generation

Conservation of existing forests and reforestation as well as improved land practices mostly through soil and water conservation techniques constitute the services sold in the PES scheme in Bokod, Benguet between upland host communities (seller) and a downstream hydropower plant (buyer). Hydroelectric power producers depend on sediment-free water flows and may be vulnerable to damage or disruption from flooding (Cruz, Francisco, and Conway 1988).

Providers of watershed services are paid for changes in their land management practices (proxy service) that are believed to have a high probability of resulting in the provision of the hydrological service (Wunder, Engel, and Pagiola 2008; Wertz-Kanounnikoff 2006). In Bokod and Kabayan, these can come in the form of conservation of existing forests and reforestation and management, as well as improved land practices mostly through soil and water conservation techniques.

The seller comprises of nine host barangays and two people's organizations, the Shakilan ni Ikulos Indigenous Peoples' Organization and the Tinongdan Indigenous Peoples' Organization. The buyer is a firm specializing in generating renewable energy from hydropower systems and is one of the oldest hydropower plants in the

Philippines harnessing water from the Agno River and its tributaries for energy production. The plant has an average annual production of 332 GWh which is 3.5% of the country's total hydropower generation of 9,605 GWh in 2017 (SN Power n.d.). The company is registered as a renewable energy project under UN's Clean Development Mechanism which allows it to earn certified emission credits, with each credit unit equivalent to 1 ton of carbon dioxide reduced.

There are two kinds of benefits derived by Bokod from the power plant: (1) the statutory benefits in terms of tax payments mandated under existing government laws, and (2) the voluntary social development and livelihood assistance. Aside from business taxes, the power plant pays the national wealth tax equivalent to one percent of its gross revenue. The Implementing Rules and Regulations (IRR) of the EPIRA allocate this revenue following a sharing scheme among the province, municipality, and barangay/village hosting the project. Allocation by use shows that these mandated benefits goes to (1) electrification fund, (2) development and livelihood fund, and (3) reforestation, watershed management, health, and/or environmental enhancement fund.

## Socio-economic and environmental effects

In his essay *The Future of Payments for Environmental Services*, Ferraro (2011) narrated that credible and concrete evidences of improvement of environmental and social conditions from PES are still lacking. This section shows the effects of the PES schemes in revenue generation, livelihood opportunities, and environment.

#### Run-of-river hydropower generation

Both the municipality of Bakun and Sablan admitted that the presence of the hydropower company as their partner significantly boosted their tax revenues (*see* Table 2 on next page).

In addition to the mandatory taxes paid by the hydropower companies, Sablan accessed the Energy Regulations 1-94 (ER1-94) funds as well as enjoyed negotiated benefits. ER1-94 of the

#### 14 ABANSI

Devenue item	Average amount (in Php)*	
Revenue item	Bakun	Sablan
Power generation share of municipality	5,666,038.77	4,376,362.92
Power generation share of host community	2,833,019.39	1,343,244.48
Real property taxes	2,614,890.44	775,901.92
Business taxes	837,146.56	975,268.89
National wealth taxes	_	2,512,037
Total	11,951,095.16	9,982,815.21

 TABLE 2
 Three-year average revenues generated by the local government and the host communities

\* Average for 2013–2015

Source: Municipal Treasurer's Office, Municipalities of Bakun and Sablan

Department of Energy (DoE) provides that a certain percentage of electricity sales be allocated to host communities for (1) electrification, (2) development and livelihood, and (3) reforestation, watershed management, health and environment enhancement programs. Likewise, during the construction of the plants, access roads were developed which serve as farm-to-market roads. As the local partner of the host communities, residents are employed to operate and maintain the plant thus contributing to job creation. Farmers are also allowed to tap at strategic points in the company's pipes for irrigation purposes. Moreover, livelihood projects such as cutflower production and eco-markets are introduced in the communities with accompanying microfinance packages.

Non-financial benefits perceived as the hydropower company's gesture of goodwill in response to the urgent needs of the communities include (1) support to education such as subsidizing college and high school scholars, construction of school buildings, and refurbishing computer rooms; (2) capability-building, such as training for cooperatives and emergency response; and (3) strengthening of property rights given that the company paid owners for lands where the company's pipes pass through. Van Noordwijk et al. (2012) argue

that in many developing country contexts, community scale factors strongly influence land users' decisions, whereas unclear land rights complicate the use of market-based instruments. Results of the focus group discussions with the residents of the community showed that they recognize improvements in social organizations, in quality of life and social image, empowerment, and gender participation. The study of PES in developing countries of Pattanayak, Wunder, and Ferraro (2010) though, found only one study with social impact and this came in the form of increased off-farm labor.

There is no concrete analysis of the environmental effects of the company's hydropower generation activities. However, as part of voluntary self-regulation, the hydropower company collects water samples at the intake point and tail race twice a year and have the samples tested for major pollutants. For the years 2013 to 2015, there is no significant difference in the quality of water at the intake and tail race points and values for parameters at both points are within the standards set by the DENR. This is quite different from the experiences of three hydropower projects at the Jiulong River in Southeast China where water quality deterioration was observed in the host communities (Wang and Chen 2010). It is worth noting that the hydropower company is a consistent awardee of DENR's Partnership for Environmental Protection Program. Monitoring of the environment of host communities takes the form of visual inspection of land use, changes in forest cover, and amount of environmental service produced.

#### Reservoir/dam-based hydropower generation

All mandatory taxes have substantially supplemented the revenues of the municipality of Bokod and Benguet Province (*see* Table 3 on next page). Bokod claimed that the total cash benefits and assistance from the power company was substantial and constitutes the biggest source of funds for the community.

The funds derived from the power plant are then integrated in their annual budget appropriation for community development. For

Year	Benguet Province (20%)	Municipality of Bokod (45%)	Barangay Ambuklao (35%)
2013	7,467,530.54	16,801,943.72	13,068,178.45
2014	9,314,909.12	20,958,545.51	16,301,090.95
2015	6,971,951.86	15,686,891.68	12,200,915.75
2016	3,078,363.52	6,926,317.92	5,387,136.16
2017	784,009.23	1,764,020.76	1,372,016.15

TABLE 3 Shares from sales of electricity as mandated by the EPIRA Law

Source: Municipal Accounting Office, Municipality of Bokod

the most part, it is the LGU's prerogative to utilize the payments from the hydropower company to finance basic community services such as health and education, as well as for community development projects prioritized by their local legislative council. Priority development projects identified by the LGUs are categorized either as support services for environment protection and management, economic development and social services.

The voluntary benefits or negotiated benefits are provided by the hydropower company through its Corporate Social Responsibility (CSR) fund which finances strategic development projects in Ambuklao's host communities. The fund focuses on supporting selfsustainable and long-term projects in the areas of environmental management, eco-tourism, healthcare, education and social infrastructure. Other benefits are in the form of carefully prioritized infrastructure projects such as roads and bridges while others are in the form of social development, livelihood assistance, and reforestation. Aside from projects identified by the company's CSR program, other projects are funded in response to the requests of the LGU and/or people's organizations (POs). Under its regular CSR program (CSR 1.0), the company developed strategic partnership with the host communities and implemented projects to create value for these communities and minimize risk for the company. The following are examples of projects carried out in the host communities:

- Trainings for capability building of host LGUs
- Technical cooperation with National Power Corporation on fireline and firebreaks
- Partnership with DENR on adopt-an-estero project
- Binga Forest Nursery
- APARK (Aboitiz Passion for Agroforestry and Reforestation to Keep)
- Target = 9M trees by 2020
- Tree planting activities (August 2015 to October 2017): 31,484 seedlings in 32.67 hectares
- NEXUS Demonstration Farms Project (food-energy-water synergy and trade-offs)

The company also collaborates with the Baguio Regreening Movement in the latter's many projects. Watershed management programs are currently being implemented to help protect the forests and other areas within the impact area of the plant. For the last three years, water rescue training for barangay emergency volunteers has been conducted in its host communities.

It is clear from the above discussion that the payments for watershed protection are not earmarked from the share of the host communities and therefore the link between the user and provider is weak. There is no separation of the fund from the regular finances of the host municipalities and barangays, therefore more interventions have yet to be done in financing natural resource protection and management. To ensure the long-term positive impacts of PES, Kroneberg and Hubacek (2013) suggest a decentralization of revenues and capacity building to ensure further development opportunities. A privately-led scheme can contribute significantly to ensuring that PES funds are held in trust and use is decided upon by the stewards of the water resource.

# Exploring a private-led PES scheme in the Mt. Pulag Subwatershed

#### Beyond the host community

The existing PES scheme in Ambuklao, Bokod is government-led and guided by EPIRA. However, it should be noted that several tributaries emanating from communities other than the host such as Eddet and Bashoy in Kabayan and Ekip in Bokod drain into the Agno River which in turn feeds the downstream hydroelectric power plant in Ambuklao. These three communities are engaged in livelihood and other activities that create both positive and negative externalities to the operation of the downstream hydropower plant.

The three communities have shifted from the traditional gardening of sweet potatoes to the commercial farming of vegetables such as carrots and cabbages. Since most of these gardens are in steep slopes, the land use activities significantly affect the quality of water that drains into the Agno River. If incentives are not acceptable, potential service providers are likely to ignore them in their private decision-making, leading to environmentally sub-optimal land use decisions (Milan et al. 2017). For Eddet, Bashoy, and Ekip, there is no incentive to practice good land stewardship especially if this will impede on their pursuit of livelihood. Vegetable terracing is practiced in both communities and has substantially contributed to the income of families and clans. The visit to the sites showed that vegetable terracing has moved quickly even on the steeper slopes of the mountains. However, the vegetable terraces have no hedges, resulting in massive run-off and soil erosion. When not properly maintained, terraced farming can lead to catastrophic effects like mudslides, creation of deep gulleys and increased soil erosion particularly in sandy soils and extremely steep terrains (Zheng et al. 2007). Terracing also leads to reduced soil quality due to leaching of important nutrients from the soil especially when top soil is eroded. Fertile soils are a non-renewable resource, they take thousands of years to be formed (FAO 2009; Kosoy, Martinez, and Muradian 2007).

The payment scheme discussed earlier is implemented in the municipality of Bokod with significant focus on Ambuklao, the host barangay. Kabayan does not receive any mandated benefits in view of the definition of host communities as provided for in EPIRA. Ekip, on the other hand, is located in Bokod, a host municipality, but it is not a host barangay. Nevertheless, Ekip might be benefitting from the share of the municipality of Bokod from the mandated payments because this payment goes to the general fund which the municipality allocates to all barangays. According to Bhatta, Helmuth, Rucevska, and Baral (2014), the PES scheme in Nepal has given rise to the ongoing debate and conflict about whether the profit made by the local government should be distributed in its totality to upstream communities. The conflict has yet to be resolved despite local government propositions for an increased benefit sharing mechanism.

Part of the share of the province might have also helped Eddet and Bashoy, but records on this are not available. Data on the allocation for development projects in economic services, social services, and environmental protection and management in the communities of Ekip, Eddet, and Bashoy (*see* Table 4 on next page) provide a glimpse of the priorities based on the amount of dedicated fund. Comparison shows that among the programs, projects, and activities prioritized by the LGUs, environmental services receive the lowest budget allocation.

The land use activities in Eddet, Bashoy, and Ekip significantly affect the quality of water that drains into the Agno River. Therefore, a PES scheme anchored on voluntary payments is imperative for Eddet and Bashoy in Kabayan as well. The public good characteristics of watershed services provide little incentive for landholders to consider the downstream effects of their land-use decisions, therefore a link should be facilitated between the buyer and provider of watershed services. Lin and Nakamura (2012) stated that one unique and critical governance characteristic of the PES approach is recognized, namely the existence of intermediary organizations or brokers that integrate the economic incentives of both payees and payers in order to facilitate their transactions through contractual agreements. During the community consultations, the following indigenous peoples' organizations (IPOs) are existing, have sufficient track records, have

#### 20 ABANSI

Programs,	Year, amount (in Php), and percentage of allocation				
activities	2016	2017	2018		
Barangay Ekip, Municipality of Bokod					
Economic services	14,920,000 (38%)	31,144,000 (32%)	33,940,000 (32%)		
Social services	18,520,000 (47%)	53,768,500 (55%)	54,880,000 (51%)		
Environmental protection and management	5,550,000 (14%)	12,140,000 (13%)	19,280,000 (17%)		
Barangay Eddet and Bashoy, Municipality of Kabayan					
Economic services	186,350,000 (68%)	85,980,000 (59%)	86,640,000 (62%)		
Social services	83,915,000 (31%)	53,835,000 (37%)	45,185,000 (11.4%)		
Environmental protection and management	4,320,000 (3%)	6,520,000 (4%)	7,820,000 (5.6%)		

 TABLE 4
 Three-year allocation for priority projects in the communities of the subwatershed

Source: Annual Investment Programs 2016, 2017, and 2018, Municipalities of Bokod and Kabayan, Province of Benguet

entered into partnerships with national and local programs and can be considered as potential intermediaries (*see* Table 5 on next page).

It is obvious, though, from the consultations that despite its desire, the community is not yet ready to enter into a PES scheme. There seems to be a lack of understanding of the spirit of PES as manifested by the community's intention to seek funds from the power plant for purchases of equipment, furniture, and other expenses that have no link to the effective provision of hydrological service. Even some of the PAMB members could not fully grasp how a PES scheme will work in the area.

Option for an expanded voluntary payment scheme

This section investigates the willingness and readiness of a hydropower company to engage in a PES scheme beyond the host communities. In their study of two government-driven PES initiatives for watershed

Barangay	IPOs	Partners
Ekip	Karao Tribal Multipurpose Cooperative, Inc. (KTMPCI)	NGP
	Karao Ekip Tribe Regreening Movement (KETRM)	NGP
	Karao Ekip Tribe Regreening Movement (KETRM)	NIA
	Ambalgan Irrigators Association	NIA
Eddet	Kebajan Federation of Farmers' Association	NGP, CHARMP2
	Greenphil Farmers Association	NGP
	Chontog Talukip Irrigators Association	NGP
Bashoy	Bashoy Multipurpose Farmers Cooperative	

TABLE 5 Indigenous peoples' organizations (IPOs) active in the study site

Sources: PENRO Benguet 2018; J. Todiano, personal communication, May 10, 2018

in China and Vietnam, Kolinjivadi and Sunderland (2012) posed questions on the ideal role of government in an evolving sociopolitical context and highlighted the lack of voluntary participation in government administered PES schemes. Wang and Chen (2010) emphasized the importance of involving the active participation of the private sector in harnessing watershed services in hydropower development. By searching for ways by which the company can be a partner in a PES format beyond a government-led design, the scope is widened in terms of internalizing the externalities and at the same time sustaining both the natural environment and local livelihood (Huberman 2009; Georgieva, Pagiola, and Deeks 2003).

Recognizing the transboundary characteristics of bodies of water, the hydropower company expressed willingness to pay for the environmental services of the subwatershed and is willing to enter into a PES scheme with communities outside of the host municipality with CSR 2.0 program as the entry point. The company has upgraded its corporate social responsibility program to CSR 2.0 which looks beyond the host communities towards the whole watershed. The team's discussion with the company benefited from the work of Villamor, Noordwijk, Agra, and Catacutan (2007), which focuses on buyers' perspectives on environmental services. This research showed that most companies are compelled to pay for ES by the mandate of law or regulatory compliance, but others view ES from a business perspective and are therefore motivated by the business case in ES markets as well as by some ethical values. The company's willingness to enter into a PES scheme is guided by a strong commitment to its corporate philosophy and core values.

Some initial requirements were suggested by the company for a successful partnership under CSR 2.0. These are as follows:

- (1) Clear tenurial status given possible plurality of tenurial instruments in the area.
- (2) Existence of people's organizations in the area that will act as intermediaries and who will formulate a set of alternative preliminary transaction options that could lead to greatest benefit for the community.
- (3) Data on rates of soil erosion and mapping of water use. There must be an indication of the current state of soil erosion and the target reduction from the PES scheme. The company emphasized a performance-based scheme where rewards are based on results of assessment of a pre-selected indicator, in this case, soil erosion rate. It is expected that there will be discussions on provisions for conditionality of payments if supply of ES does not meet the level indicated in the agreement.

Regarding the payment mechanism and amount of ES, the company shared that CSR 2.0 is guided by the principles of creativity, scalability, and responsiveness allowing for the amount of payment to be based on the merits of the proposal from the community. This payment scheme is consistent with many cases where the payment is not based on actual valuation of ES but rather on an understanding between users and buyers. Although economic valuation of ecosystem services is at the core of PES, the complicated nature of ecosystem functions and the differing interpretations and appreciation of benefits from the ecosystem by stakeholders posed a significant challenge in obtaining credible operational valuations of ecosystem services (Costanza et al. 1997; De Groot et al. 2010; Ninan and Inoue

2013). Consequently, decision makers, especially those in developing countries, hardly mainstream values in ecosystem management and governance (Liu et al. 2010).

Results of the FGD with the power plant officials on May 22, 2018 revealed an increased willingness on their part to participate in a PES scheme for the Bokod and Kabayan communities. This is consistent with the findings of Landell-Mills and Porras (2002) of increased willingness on the part of beneficiaries to pay for services, as awareness is growing on the importance of conservation in upper watersheds for the maintenance of water services. More importantly, if PES users accrue large benefits, such as in the case of hydropower operators that benefit from the wise management of land and water resources in the upstream areas, they will have an incentive to participate in a PES program (Arias et al. 2011). Cost of preventive maintenance and/or avoidance cost is less with reduced sedimentation. Likewise, this can lead to substantial averted expenditure by preventing future damage due to sedimentation from occurring. During the tour of the power plant, one of the technical staff of the Operations Department shared that increased sedimentation is already observed in both Bokod and Itogon areas and this implies increased cost of filtration.

## Conclusions

This research project was conceptualized to ensure an effective and sustainable management of Mt. Pulag through a Payments for Ecosystem Services scheme. The project aims to analyze the potential of developing a private-led PES scheme in the protected area. Given that PES schemes are site-specific, the project delimits the site to the Eddet–Bashoy–Ekip Subwatershed, with the optimism that the process can be replicated in other communities in Mt. Pulag.

The potential of developing a private-led PES scheme in the subwatershed is high. The willingness to pay for watershed services by the downstream hydropower company was expressed in their readiness to enter into a PES scheme. The critical elements of PES in terms of the defined service, end-user or buyer of the service, supplier of the service and conditionality or payment mechanism are all satisfied in the preliminary analysis. It is worth mentioning that a power company has gone beyond payments mandated by the EPIRA. Under its corporate responsibility program (CSR 1.0), the company has engaged in voluntary payments through various programs in the host communities. It is timely that the company has upgraded its corporate social responsibility program to CSR 2.0 which looks beyond the host communities towards the whole watershed, which makes a PES scheme in the sub-watershed is possible.

As part of the preparations for the development of a PES scheme, some initial requirements for a successful partnership were suggested. These include (1) clear tenure status given possible plurality of tenure instruments in the area, (2) existence of peoples' organizations or other institutions in the area that will act as intermediaries and who will formulate a set of alternative preliminary transaction options that could lead to greatest benefit for the community, and (3) data on rates of soil erosion and mapping of water use. Once these are satisfied and the proposal from the communities have undergone a process of evaluation and approval, the parties will sit together and sign a memorandum of agreement. Details on the conduct of the PES scheme, including the transfer and use of funds, will be discussed by both parties.

# Recommendations

The following recommendations are forwarded to prepare for the PES scheme and concretize the partnership between the hydropower company and the communities via a PES scheme:

 Harmonize tenure arrangements and/or instruments in the area. The issue of tenure status has to be discussed further to eliminate possible plurality of tenure arrangements. Recognition of property rights over the land and other natural resources is directly linked with the community's continued application of sustainable resource utilization and management systems. "Clarifying formal or informal rights over assets such as land and water that deliver ES is needed to provide incentives for the investments required" (FAO 2009 and Gong et al. 2010, cited in Lipper and Neves 2011, 11). Tenure is a prerequisite to foster collective community action and support.

- Identify a suitable people's organization to serve as the intermediary in the PES transactions. The choice of intermediary must be guided by the willingness and readiness of the PO and most importantly by a good track record in partnering with other organizations, providing accountability, delivering expected outputs, and ensuring that conditions of the agreement are fulfilled. The company expressed willingness to accept other institutions as intermediary given that community-based PES mechanisms are often based on effective institutional structures and a capacity for proper negotiation.
- Conduct a readiness and capability-building activity for participants of the PES. The communities must have a good understanding and appreciation of the principle behind PES as a management scheme and their responsibilities as seller of land use services. The activity will also equip the communities in articulating and developing their project proposal for appropriate targeting such as soil erosion reduction, which satisfies the criteria of equity, effectiveness, measurability, accountability, sustainability, and innovation. At the moment, the communities have a proposal on hedgerows in mind but other project proposals can be forwarded as well.
- Intensify research to address both data and research gaps. Data on hydrological attributes (quantity, quality, seasonality) and soil erosion rates are some of the critical data that were not available during the time of the study. Mapping of water use must be revisited and updated. Changes on soil erosion rates before and during the implementation of the PES scheme will provide the basis of continuous payments and incentives. Porras, Grieg-Gran, and Neves (2008) shared that in many PES schemes implemented, there is little evidence of impact especially in water-related investments. They provided

examples where evidence of watershed management impacts are based on actual monitoring, at least of the adoption of practices expected to deliver the expected hydrological benefits, but noted that in many cases the only information available is based on local perceptions.

The communities must take advantage of the enthusiasm of a private entity to participate in a PES scheme. Porras, Grieg-Gran, and Neves (2008) shared that few schemes have been able to secure commitment from direct beneficiaries (with private funds) of improved ES delivery, despite initiatives and incentives from government. The partnership among the communities and the power company can allow for mutual re-enforcement, building resilience and checks in the system that ultimately may make the programs more effective and sustainable.

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