

RESEARCH ARTICLE

# Towards Establishment of a Payment for Ecosystem Services (PES) in Protected Areas: The Case of Mounts Banahaw and San Cristobal in Quezon Province, Philippines<sup>1</sup>

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This paper examines the potential of establishing payments for ecosystem services in the Mounts Banahaw and San Cristobal Protected Landscape. The findings show that this process entails more than just determining the willingness to pay of those who are benefiting from the ecosystem services. It also requires the buy-in of potential sellers. More important is clearly defining the product, that is, what the buyers will be paying for and what the sellers will be providing, so that the ecosystem service will be sustained. In addition, identification of some third parties to mediate between buyers and sellers and to serve as fund manager are critical components. Overall, the experiences of Sariaya and Dolores may provide useful insights for other areas considering payment for ecosystem services as a way to sustain ecosystem services.

**Keywords:** ecosystem services, payments for environment services, protected area management, watershed management, willingness to pay

**JEL Classification:** Q01, Q23, Q57, Q58

Payments for watershed services emerged in response to the dwindling funds for environmental protection and conservation and the dangers and costs of forest degradation or loss, such as water shortage and quality deterioration, and the unmet demand of particular sectors for particular forest environmental services. Despite the hype that payment for ecosystem services (PES) has created in the conservation and sustainable financing sector globally, it has not really taken off in the Philippines.

One of the challenges that the government faces is that it does not have enough resources to sustainably finance the protection and conservation of these protected areas (Pagiola et al., 2002a). The establishment of PES has been considered as one of the options that the government can pursue to address this basic concern of financing (Pagiola et al., 2002b). While the literature on PES in other countries is relatively abundant, we cannot say the same for the Philippines.

This study explores the potential of establishing a PES for the Mounts Banahaw and San Cristobal Protected Area and discusses all attendant issues and proposes ways forward. The results of this study contribute to policy on protection and conservation of protected areas and delivery of watershed services. It provides inputs to local and national governments on financing and establishing relevant policies on watershed rehabilitation and protection and contributes to the relatively thin literature on watershed PES experiences in the Philippines.

Republic Act no. 7586, known as “The National Integrated Protected Areas System (NIPAS) Act of 1992,” provides the legal framework for the establishment and management of protected areas in the Philippines. This law defines protected areas as the identified portions of land and/or water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploration. The establishment and management of protected areas are part of the international commitments signed by the Philippine Government, such as the Convention on Biological Diversity, Ramsar Convention, World Heritage Convention, Convention on Migratory Species, and the ASEAN Agreement on the Conservation of Nature and Natural Resources.

## Establishing Payments for Ecosystem Services

Payments for watershed services emerged in response to the dangers and costs of forest degradation or loss, such as water shortage and quality deterioration, and the unmet demand of particular sectors for particular forest environmental services. The main concerns addressed in these initiatives have been maintenance of dry season flows, protection of water quality, and control of sedimentation (Landell-Mills & Porras, 2002). The limited capacity of local and national governments to finance and enforce policies on watershed rehabilitation and protection stimulated local private initiative.

Despite the hype that PES has created in the conservation and sustainable financing sector globally, it has not really taken off in the Philippines or in Southeast Asia. There are numerous reasons being offered on why this has been so in the country, such as the lack of tenure and weak property rights regime in the natural resources sector, the lack of monitoring schemes that can ensure sustainable provision of environmental services, the monopolistic and oligopolistic character of big business, the inertia of government in proactively pursuing PES, the inability of government (or local sellers) to use payments to enhance the very service they were intended for, and the weak negotiating skills of local communities in bargaining for just compensation for protecting their environment, among others. These concerns, however, do not totally discount the potential of payments for watershed services being mainstreamed in the *NIPAS* given the enormous contribution to watershed protection and water supply. What may be developed would be PES-like schemes. Specifically, watersheds are not necessarily privatized, payments may not necessarily be in cash, participation may not always be voluntary, and government bodies can act as buyer, seller, or broker or sometimes perform dual roles in a scheme.

Payments for watershed services will not always mean cash payments. In fact, what will be encouraged would be an increase in participation of local stakeholders in conservation and protected area (PA) management, with corresponding rewards or payments to be made for their effort. Despite that, this will still be pursued as a sustainable financing scheme. Successful PES or PES-like schemes would mean lower costs for PA managers as more of their work is taken over

by local stakeholders who get compensated by doing so. Furthermore, successful PES schemes can lessen threats from local sources as more local people directly and materially benefit from conservation. The schemes are intended to sustainably finance conservation.

Markets for watershed services are usually local in scope with most transactions occurring at the watershed level. Markets for watershed protection usually do not involve trading commodities such as water quantity or quality, but rather financing land uses that are generating watershed benefits. Demand for water services mostly originates from downstream water users, including farmers, hydroelectric producers, and domestic water users in urban areas (FAO, 2000). Given the local nature of demand and the presence of a limited number of well-organized beneficiaries (e.g., water or hydroelectric utilities, irrigation commissions), it is relatively easy to mobilize downstream beneficiaries and involve them in PES schemes. However, watershed-based services are usually funded through user fees to finance improved management of the protected area upstream. Use of hydrological models to link conservation practices with the generation of water quality and quantity services has been found useful in ensuring that the PES system is providing the services for which beneficiaries are paying.

A survey of 61 watershed-based payment schemes conducted by Landell-Mills and Porras (2002) found that these markets are more institutionalized and rely on a cooperative relationship between demand and supply rather than on competition among service providers and beneficiaries. This survey also found an increased willingness on the part of beneficiaries to pay for services, as awareness of the importance of conservation in upper watersheds for the maintenance of water services is growing. The improved management of the upper watershed for the maintenance of water services is a strategy implemented in several countries in Latin America and the Caribbean, including Brazil, Colombia, Costa Rica, the Dominican Republic, Ecuador, Honduras, and Panama (World Bank & World Wildlife Fund Alliance for Forest Conservation and Sustainable Use, 2003). In most cases, the approach favored is the establishment of protected areas rather than the creation of PES systems to improve management practices among land users. However, watershed-based PES schemes are increasingly used and have been put in place in several countries, including the United States,

Mexico, Colombia, Ecuador, Costa Rica, Honduras, and Brazil.

One commonly cited example is the system established by the city of New York, USA, to protect its drinking water sources (Landell-Mills & Porras, 2002). In the late 1990s, the city of New York increased water fees by nine percent to invest in the protection of the Catskill/Delaware and Croton Watersheds. This was done primarily through a land acquisition program and conservation easements that expanded the protected area within the watershed. In addition, farmers and forest producers received compensation under new programs to remove environmentally sensitive lands from production or to improve forest and land management practices. Another well-known example is the *Fondo Nacional del Agua* (FONAG) in Ecuador. FONAG collects contributions from water users, including the water utility of the city of Quito and a hydroelectric power utility, to fund conservation practices in the upper watershed that provides drinking water for the city of Quito (Echevarria, 2002). Also in Ecuador, the municipality of San Pedro de Pimampiro developed a pilot project aiming to protect drinking water sources by paying land users in the upper basin to improve forest management in the watershed. In the Cauca Valley in Colombia, farmer associations initiated a PES system to address concerns regarding the sustainable supply of water for irrigation. Since its inception, this scheme has led to the adoption of conservation measures in over one million hectares of land. The system annually raises USD 600,000 in revenues from water user fees (Landell-Mills, 2002). Similarly, farmers in the Guabas River watershed in Colombia have negotiated an agreement with upstream land users to improve land use practices in order to maintain dry-season water flows. The system is financed through additional charges for water use. In the states of Paraná and Minas Gerais in Brazil, municipalities receive five percent of the state sales tax to finance upper watershed conservation programs to protect drinking water sources. This program has led to the conservation of one million hectares of land in the state of Paraná and over one million hectares in Minas Gerais. Also in Brazil, São Paulo's water utility has agreed to contribute one percent of its revenues to fund conservation and forest restoration activities in the Corumbatai watershed.

### The Study Framework

PES is a method of internalizing the positive externalities associated with a given ecosystem or a specific resource use (Pagiola, 2004). Wunder (2005) defines PES as a “voluntary transaction where a well-defined environmental service (ES) (or a land-use likely to secure that service) is being ‘bought’ by a [minimum of one] ES buyer from a [minimum of one] ES provider if and only if the ES provider secures ES provision conditionally.”

Figure 1 shows the basic structural design for PES. This model is simple and flexible and can fit various socioeconomic and environmental conditions. The principle behind PES is that resource users and communities who provide ecosystem services should be compensated for the costs of their provision and that those who benefit from these services should pay for them. The PES approach provides a strong incentive to environmental protection and conservation.

However, real-world application has many challenges: (1) lack of knowledge concerning the links

between ecosystem management, service provision, and economic activity; (2) the absence of enabling policies and institutions to capture willingness to pay (WTP), resulting in limited effective demand for ecosystem services; and (3) limited capacity to design and implement PES schemes, especially in developing countries.

In the case of watersheds, management usually involves upstream land users and downstream water users. Upstream land users (in protected areas, mostly illegal settlers or indigenous population) may be paid for not using the land in ways that will affect water quality and quantity for drinking water, irrigation, maintenance of dry-season flows, and control of sedimentation, among others, downstream. Specifically, upstream land users can put a stop to deforestation and instead undertake afforestation and reduce soil erosion on agricultural lands or cease slash-and-burn agriculture.

Figure 2 explains why creating markets for PES can work. Briefly, there are two economic agents, that is, buyers and sellers, who will each have the incentives

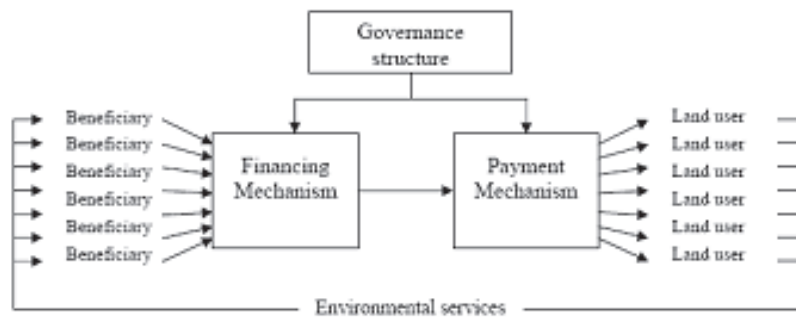


Figure 1. General structure of PES mechanisms. Adopted from Pagiola et al. (2003).

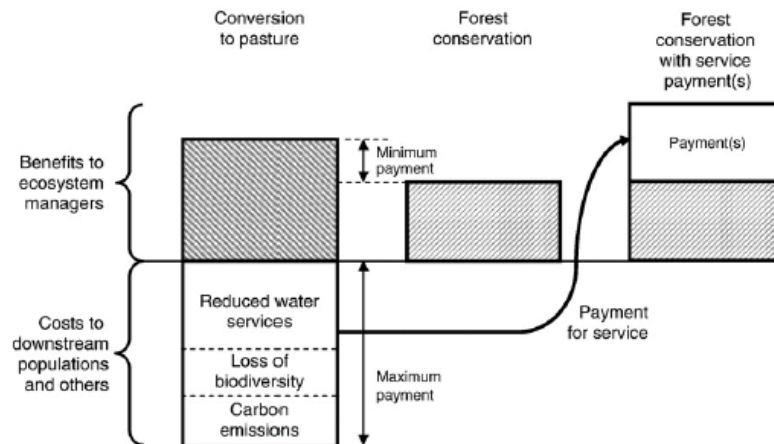


Figure 2. The logic of payments for ecosystem services. Adopted from Pagiola and Platais (2007).

to interact. The potential gains by the buyers should exceed the costs to the sellers for the market to be realized.

This PES program being launched is creating markets for watershed services that are local in scope with most transactions occurring at the watershed level. These markets usually do not involve trading commodities such as water quantity or quality but rather financing land uses that are generating watershed benefits. Given the local nature of demand and the presence of a limited number of well-organized beneficiaries, it may be relatively easy to involve downstream beneficiaries in PES schemes. Schemes for payments of watershed services include self-organized private deals, public payment schemes, and trading schemes.

Compared to government subsidies, PES can lead to more sustainable outcomes by generating a continuous flow of payments. Also, PES schemes are likely to be more cost-efficient than the combination of regulatory approaches and subsidies, which require significant government resources to manage. Enforcing conservation measures, land use regulations, or specific agricultural or forest management practices on poor communities that depend on resource exploitation for their livelihood has often failed. These regulatory approaches hurt resource users by banning activities that are essential for their livelihoods and pushing them toward illegal survival patterns.

PES schemes usually rely on flexible structures that can be self-supporting in the long run, thus likely to be sustainable. Also, successfully implemented PES schemes can lower costs for PA managers as more of their work is taken over by local stakeholders. Effective PES schemes can lessen local threats as more resource users directly and materially benefit from conservation. The PES schemes are expected to result in sustainable financing for conservation, in addition to traditional modes of raising revenues for protected areas.

In setting up payment schemes for watershed services, the following are the necessary elements: (1) identification of potential buyer(s) and seller(s) of watershed protection services; (2) use of hydrological links/studies to establish watershed boundaries for the PES scheme, when feasible; (3) stakeholder consultations and some capacity building among local stakeholders who are identified as part of the

PES; (4) clearly defining the role of local and national government bodies; (5) economic valuation studies to establish the appropriate “price” for the payment scheme, using the most appropriate valuation method for each local area to be studied; (6) negotiating in behalf of the sellers; (7) drafting appropriate legal instruments and agreements; and (8) setting up a system for monitoring scheme to ensure sustainability and continuity.

## **Identification of the Buyers and Sellers**

### ***The Buyers***

Two types of buyers can be identified from these forms of PES: (1) direct users whether households or private firms in “user-financed PES” and (2) the government on behalf of final beneficiaries in “government-financed PES.” In a “user-financed” PES program, the buyers are the actual users of an ecosystem service. This form will be efficient as the actors with the most information about the value of the service are directly involved, have a clear incentive to ensure that the mechanism is functioning well and can observe directly whether the service is being delivered, and have the ability to renegotiate (or terminate) the agreement if needed (Pagiola & Platais, 2007).

In “government-financed” PES programs, the buyers are a third party acting on behalf of service users. This is typically a government agency, particularly local government units (LGUs) in Mts. Banahaw and Kalatungan with the Protected Area Superintendents (PASUs) mobilizing communities on the ground to serve as sellers. These relatively nominal contributions of LGUs are over and above the regular environment-related activities of the municipalities and cities.

There are, however, associated concerns with this form because the buyers are not the direct users or beneficiaries of the ecosystem service; they have no firsthand information on its value and generally cannot observe directly whether it is being provided. They also do not have a direct incentive to ensure that the program is working efficiently and may be subject to some political pressures. Thus, this form may be less likely to be efficient. However, because of potential economies of scale that may lower transaction costs, it is possible for government-financed PES programs to be more cost-effective than user-financed PES.



### ***Defining the Watershed Service and Identifying Potential Buyers and Sellers***

A prerequisite to environmental payments and evaluation of resource management financing potentials is clearly identifying and defining the goods and services from watershed ecosystems. Watershed ecosystems provide essential goods and services that result in direct and indirect economic benefits. Among these goods or services are supply of freshwater for various consumptive and nonconsumptive uses; regulation of the flow of sediments and nutrients, which affects the quality of accessible water; and support for ways of life that have cultural value and involve land use practices consistent with continued provision of services (Tognetti et al., 2006). Consumptive uses include *freshwater* for drinking and other domestic, agricultural, commercial, and industrial uses. Nonconsumptive uses include *hydropower generation* and *cooling water*.

The *flow regulation* and *filtration* service, on the other hand, include the control of mean surface runoff, peak or flood flows, base or dry-season flow, erosion and sediment load, and recharge of groundwater and soil moisture (FAO, 2002). Among the benefits from this regulation and filtration service are (a) water storage in soils, wetlands, and floodplains; (b) control of erosion and sedimentation; (c) maintenance of river channels, wetlands, riparian habitats, fisheries, and other wildlife habitat; (d) maintenance of mangroves, estuaries, and coastal zone processes; (e) control of the level of groundwater; and (f) maintenance of water quality (Tognetti et al., 2006).

Supporting services include (a) maintenance of natural flow and disturbance regimes as drivers of ecosystem processes, which also supports ecosystem resilience; resilience, which in turn provides some measure of insurance against the uncertain effects of a change in conditions, for which thresholds are generally uncertain; (b) support for cultural values, which may include aesthetic qualities that support tourism and recreational uses, and support for ways of life.

It is important to note that the above services are interdependent and that there is a trade-off between provision of freshwater for direct uses and the regulatory and supporting services that ensure continued provision. Thus, an acceptable or optimal balance between these trade-offs should be taken into account in development planning.

In identifying the beneficiaries and providers of environmental service in the chosen PAs, a clear definition of environmental services has to be established together with the relevant stakeholders. A reconnaissance survey and focus group discussion (FGD) have to be conducted at each site to identify the services and beneficiaries and the service providers.

### ***Hydrological Studies***

In cases where financing for watershed management is borne by the local government and some nongovernment organizations, it appears that the long-term solution is to have beneficiaries of watershed management contribute their fair share to the costs of watershed management. This requires understanding and appreciation of the hydrological impacts of land use decisions as they affect the economic utility of downstream users.

This part of the study can make use of available results of other studies that help establish the link between the services that buyers will be paying for (institutional and physical management structures) and the benefits that will be generated (Ranjan, 2019; Ureta et al., 2020). This component can contribute to the baselines for environmental monitoring and provide a clear and “consensual scientific evidence” that links land uses to the provision of watershed services.

### ***Valuing Watershed Services***

No single valuation technique can provide an estimate of the total economic value of watershed environments. And no particular approach is more valid than another. Estimation of meaningful economic values for all individuals that might potentially benefit from water quality improvements remains a considerable methodological challenge. To capture the “total economic value” of a given improvement in a watershed system, both use and nonuse values must be estimated. The methods available for valuation of watershed services differ in terms of both data requirements and underlying assumptions about economic and environmental linkages. The estimation potentials of the various techniques tend to be limited to different aspects of the total environmental service packages tied to watershed systems. To determine the total economic value of any given watershed, several methods have to be applied within the specific protected area or watershed of interest. That is, several valuation techniques have to be utilized to establish an

estimate for a water-user fee to be used to support the preservation of nonmarket watershed benefits.

### ***Assessing Needs of Potential Service Providers and Establishing Relevant PES Institutions***

For communities involved in PES schemes, the creation of new markets for watershed protection services while promising will entail a lot of groundwork. PES schemes may not work effectively if poor communities, which are most dependent on the land for their livelihoods, are excluded from the system. It is important to integrate these populations and extend the benefits of PES schemes to them. Several strategies may be advanced to maximize benefits to poor communities and minimize the chance of the PES schemes further marginalizing. Among the relevant concerns are the need to clarify and strengthen land tenure, create or strengthen cooperative institutions to reduce transaction costs, define cost-effective and flexible payments mechanisms, provide flexibility in eligible land uses, facilitate access to start-up financing, and invest in community capacity building (Mayrand & Paquin, 2004).

The granting of privileges under the NIPAS Act to long-term residents is premised on the assumption that long-term residents would already have incentives to conserve if only they have tenure. In over two decades since the passage of the law, however, there have been no massive displacements in protected areas. Education of occupants in NIPAS has been consistent on the parts of both the government and civil society organizations. The communities may no longer feel threatened even without a Protected Area Community-Based Resource Management Agreement (PACBRMA). The urgency of securing one may no longer be there and may no longer be a key concern for communities in protected areas.

Capacities to provide services are also highly variable and engaging whole communities in a contract when even the choosing of who among them performs the services or gets paid creates dissension in the organization. Furthermore, the quandary between tenured migrant status, which presumably applies to persons or families, and a PACBRMA, which is a community instrument, can be avoided.

It would be useful to explore new and negotiated agreements that are based on needs under the management plan rather than assumed community aspirations that may no longer exist. Such agreements can take into consideration the site priorities, the

capacities of qualified tenured migrants, and their appropriate groupings and empower both the PASU and the community leaders in crafting agreements based on site needs.

For this project, at least one of the three PES sites with a PACBRMA is considered in order to assess the benefits of using this instrument as a negotiating platform. This yields important policy recommendations to make the PACBRMA process customizable to accommodate PES arrangements. The rest considers any existing grouping or association that has the best chance of delivering the services paid for, including but not limited to irrigation associations, auto or *barangay* groups, *Bantay Gubat* groups, or informants' networks.

This component of the PES establishment includes a rapid assessment of the management needs and provider identification including capacities, followed by a matching of these needs and capacities and a strategic assessment of the negotiation process to be undertaken. The process can be validated with the providers, and the negotiations would be facilitated.

Outputs can include the agreements themselves and recommended guidelines for the PASU in hammering out such agreements and for the rest of the bureaucracy to recognize them.

### ***Setting up of the Financing, Payment, and Monitoring Structures***

This component of the project recognizes that a PES scheme is seen not only as a sustainable financing issue but as a governance issue as well. The agreements between the major players in the financing scheme, that is, DENR, the Protected Area and Management Board (PAMB), communities (sellers), and buyers of ecosystem services, should capture the issues of financing and governance in the short run and the long term, based on negotiations of the following:

- Locating where are the “no compromise zones” and what activities are allowed in these areas. This is based on the premise that PAs were basically set-up conservation areas, with strict protection and multiple use zones identified.
- Type of financing scheme: includes the types of fees from buyers and what activities are to be financed or paid.
- Payment scheme: who collects and the flow of funds.

- Monitoring structure: who monitors and audits the fund and the manner and frequency of reporting to ensure transparency in the use of the funds, as well as the progress in conservation activities.
- Administrative cost: who shoulders the administrative cost and, if included within the PES payment, how much is the reasonable amount to cover for the administering the scheme.

## Data and Methodology

In order to ascertain the target stakeholder's participation in PES, it is important to know their willingness to participate by estimating their WTP. The study conducted a WTP valuation through the contingent valuation method (CVM). CVM is a widely accepted valuation technique that approximates the consumer surplus of a potential demand by eliciting the respondents' WTP for a given scenario.

### *Focus Group Discussion*

Prior to the survey, an FGD was conducted to gauge the awareness and perceptions of key stakeholders on the natural capital assets of their community and the environmental and economic issues and threats. The result was used as basis to ascertain the target ecosystem service to be maintained or/and improved. The result of this FGD provided the context for the hypothetical market in the valuation survey. The result also determined what interventions that can be supported by the PES scheme can be implemented.

In this study, surveys were conducted for 336 households in Sariaya, Quezon, and 169 households in Dolores, Quezon. Respondents were drawn through simple random sampling from the list of water concessionaires provided by the water districts of each municipality.

### *Survey Design*

A survey questionnaire was used to elicit the responses and WTP of the stakeholders. The questionnaire was administered through a one-on-one interview by trained enumerators with the household head. A household head was defined as an adult member of the family who contributes to the household income and who can decide on financial matters on behalf of the whole family.

The questionnaire was split into four sections. The first section elicited baseline information from the respondents in terms of their awareness of ecosystem services, ecosystem interconnectivity, and management. The second section of the questionnaire presents the current issues, problems, and threats to the ecosystem and natural resources as mentioned by key stakeholders from the FGD.

After the explanation on issues, the enumerator presented the concepts of ecosystem services, what is a PES and its framework, and the overview of a proposed conservation programs to be implemented at the upstream communities. These are all done using multicolored images. The enumerators also presented the potential benefits of the program and how the benefits will affect the respondents' well-being. Under the PES program, the expectation is that water-related ecosystem services, particularly water supply and water quality, will be improved. This will be done by supporting upland farmers to shift and implement sustainable agricultural practices of upland farmers, reforestation of several hectares of land adjacent to the strict protection zones, upgrading equipment and enforcement capacity of forest rangers, and more effective guidance of the PAMB. The suggested conservation activities were based on literatures particularly about the benefits of keeping the land covers vegetated and forested. Keeping the land cover vegetated improves the water quality since the vegetation traps sediments and nutrients keeping them within the area of the vegetation (Clay et al., 2020; Sahle et al., 2019; Shackelford et al., 2019; Ureta et al., 2020). These nutrients contribute to the growth of the crops or other plants within the area. Furthermore, enhancement of the vegetation also improves the water recharge capacity of the area since the water uptake by the vegetation is eventually released and infiltrates the ground, hence improving the water quality (Canqiang et al., 2012; Clay et al., 2020; Li et al., 2018; Sahle et al., 2019; Ureta et al., 2020).

The explanation of the specific details of the PES from the second section builds the contingent valuation (CV) scenario in the third section of the questionnaire. The CV scenario details the proposed activities to be implemented by the upland farmers, who are the target sellers in the PES framework. Furthermore, since the farmers are also instrumental in assisting forest rangers in implementing conservation programs, the activities also include reforestation efforts and enhancement of



enforcement capacity for sustainably managing the watershed. The primary objective of implementing the conservation programs is to improve water-related ecosystem services by increasing the water supply and improving its water quality.

The CV scenario also included the limitations, framework, and assumptions made in the study. Specifically, that the policy will be implemented only if majority of the respondents are willing to participate and that the study elicits their preference on the issue considering that they will have to pay and contribute to support the program. The scenario also mentioned that their financial support will be collected monthly for a period of five years and the policy will be reevaluated after to assess whether to continue or discontinue the program. Furthermore, it was also explicitly mentioned that the amount will be collected as an addition to their current water bill but it will be exclusively used only for the watershed conservation program objectives and not for other purposes. The water bill was used as the payment vehicle for the study as it is the common resource that directly links the ecosystems being valued and is also consistent in the proposed framework for PES.

To elicit respondents' WTP, the study used a referendum format wherein they have to vote yes or no on agreeing to support the policy that is presented to them considering that it will cost a certain bid amount.

Bid amounts vary per questionnaire ranging from an additional PhP 10, 30, 60, 100, and 150 per month for Dolores to PhP 10, 50, 100, 150, and 200 for Sariaya. The maximum bid amounts used in both study sites were determined by estimating the choke prices when the pretesting of the questionnaire was done as a preliminary activity. Therefore, the referendum elicits the respondents' decision to support the improvement of water-related ecosystem services, water supply, and water quality, in the Mts. Banahaw–San Cristobal Protected Landscape (MBCSPL).

Finally, the fourth section was intended to capture the demographic and socioeconomic profile of the household as part of the factors that affect their decision. The survey questionnaires were translated into Filipino for convenience and easier understanding of the questions.

## Results and Discussion

### *Economic and Environmental Issues and Threats*

FGDs were conducted prior to and after the survey to further enhance the evidences that would link the connectivity of the ecosystem services and the stakeholders' welfare. Prior to the survey, participants were asked to come up with a community map of their ecosystems or natural resources, economic uses, and threats (Figure 3). It was in this activity that

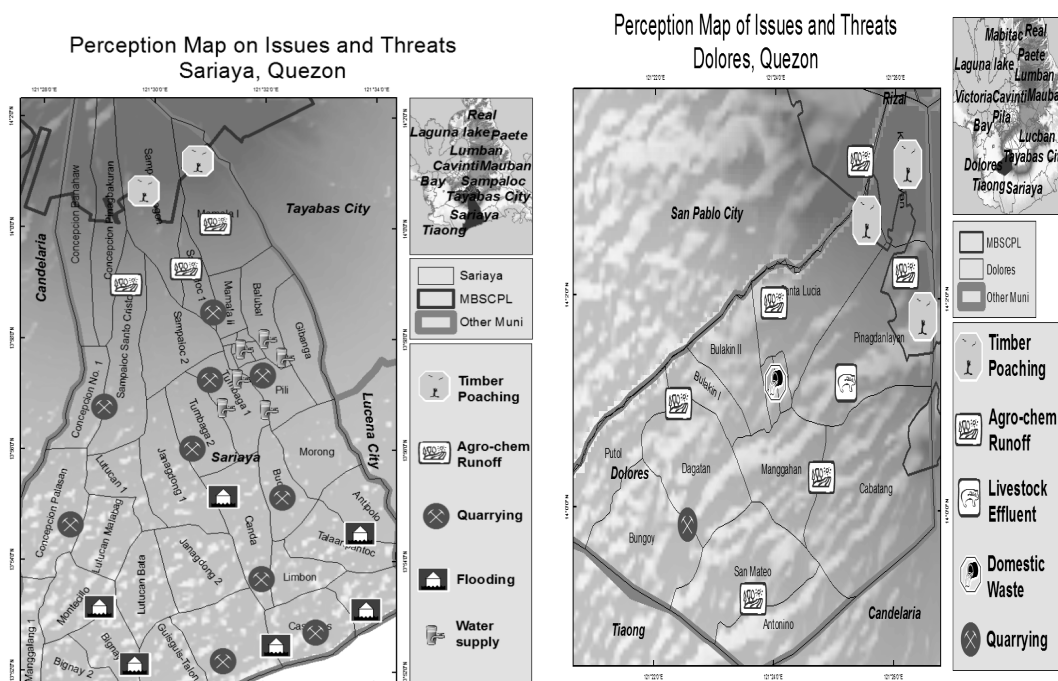


Figure 3. Perception map of threats and issues, in Sariaya and Dolores, Quezon. Source: Rosales et al. (2013).

respondents were able to understand that different economic activities negatively affect other natural resources, which in turn would have an impact on the community. However, even with these realizations, participants also acknowledge the fact that it will not be easy to simply convert their economic activities into a sustainable livelihood framework.

Conversion to sustainable livelihood and conservation activities would entail vast opportunity costs. For instance, the average earning for a hectare of land per cropping season due to high-value crops is around half a million; this would significantly decline suppose they convert to a sustainable livelihood primarily because of the transitional costs and further restrictions to adhere to sustainability standards. Therefore, an attractive alternative that compensates that value would be needed to convince them to shift. However, in case the program will push through, anecdotal claims from the participants said that they would be willing to let go of this income in exchange for assistance in establishing agroforestry farms and a monthly allowance amounting to at least PhP 11,000 per person.

**Results of the Contingent Valuation Survey**

Taking off from the Protected Area Sustainable Financing project of DENR, results of the WTP valuation showed that households are willing to pay an

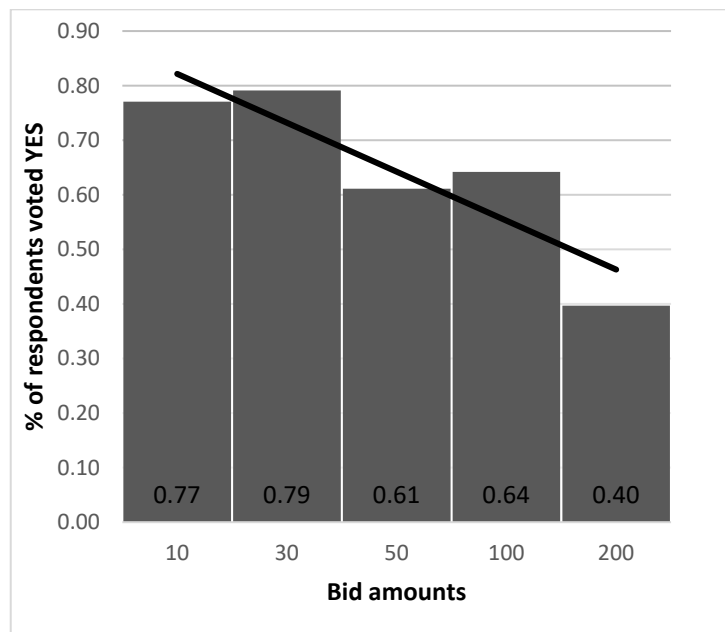
average of PhP 82.06 or within the range of PhP 56.60 to PhP 107.52 for the municipality of Sariaya, Quezon, and PhP 52.48 or within the range of PhP 47.11 to PhP 57.85 for the municipality of Dolores, Quezon (Rosales et al., 2014). This was estimated through Turnbull’s nonparametric estimation of WTP (Turnbull, 1976; Watanabe, 2010).

**The Case of Sariaya, Quezon**

Results of the survey for Sariaya showed an average household income of PhP 16,561.21 and an average household expense of PhP 11,926.52. The average water consumption per household is around PhP 98.68 while the average electricity consumption per household is PhP 1,141.67.

In terms of awareness, knowledge, and perception, residents in Sariaya claim that they are aware that the water that they get comes from MBSCPL. Furthermore, they agree that there should be a comanagement between upland and lowland stakeholders. Due to the respondents’ experience in difficulty in the availability of water, majority of the respondents are both willing to participate and willing to pay for the conservation activities.

Figure 4 shows that the proportion of respondents who agreed to contribute to the ecosystem conservation activities of MBSCPL is high. This is evident from the results since, among the respondents that were



**Figure 4.** Nonparametric estimation of mean WTP for the sampled residents of Sariaya, Quezon.

presented the maximum bid amount of PhP 200, 40% of them still indicated that they are willing to pay. This could stem from the residents' experiences regarding the difficulty in the availability of water in the area. The residents' primary reason for supporting the program stems from their eagerness to have a more reliable source of water and their wanting to preserve the ecosystem services. On the other hand, among those who were not willing to pay, the primary reason was either because they lack the funds to support or because they do not think the project will be effective and they do not trust the management. While there is skepticism among the respondents on the effectivity of the program and its management, the overall estimated mean WTP still amounted to PhP 82.06 with a range from PhP 56.60 up to PhP 107.52.

### *The Case of Dolores, Quezon*

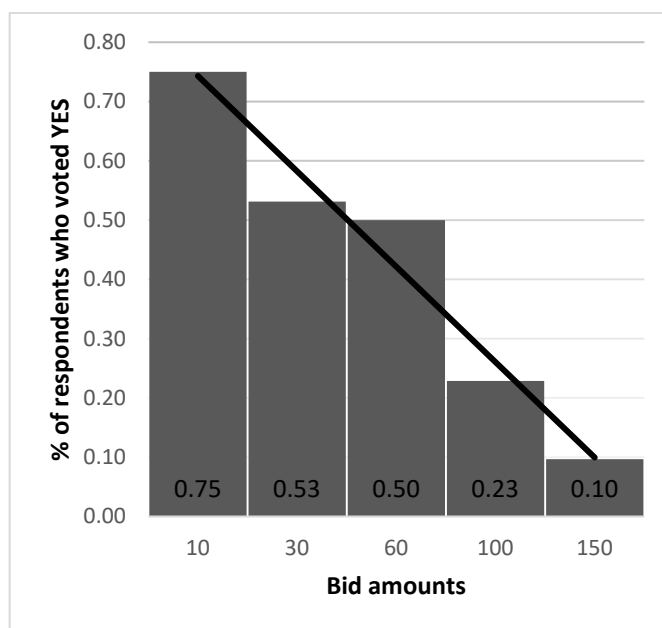
Results of the survey for Dolores showed that the average monthly income per household is around PhP 17,030.34 while the average expenses per month is around PhP 11,249.46. Furthermore, the average water consumption per household is around PhP 275.00 or equivalent to PhP 89.75 consumption per member. The average electricity consumption per household is around PhP 988.00 or an equivalent of PhP 307.50 per household member.

In terms of perception and awareness, respondents have knowledge of ecosystem services and are aware that the ecosystem services that they get come from the MBSCPL. Furthermore, respondents also agreed that there should be a collaboration between lowland and upland communities in managing the area since both benefit from it. All respondents were willing to participate in the conservation activity, but only 42% of the respondents were willing to pay.

In the case of households in Dolores, Figure 5 shows that the concentration of respondents who agreed to pay is focused in the PhP-30-to-PhP-60 bid amount range. Specific estimation of the amount resulted in a mean WTP of PhP 52.48 with a range from PhP 47.11 to PhP 57.85. Among the 42% who were willing to pay to support the program, majority of their reasons were because they care for the ecosystem and want to preserve it and because they benefit from the ecosystem. On the other hand, among those who were not willing to pay to support the program, 75% said that they primarily do not have the funds the support it. However, they will be willing to support in other ways possible.

### *Integrated Estimation of Values for MBSCPL*

A pooled analysis of all respondents from Dolores and Sariaya was carried out to countercheck the



*Figure 5.* Nonparametric estimation of mean WTP for the sampled residents of Dolores, Quezon.

consistency of the values. The pooled analysis gave a mean WTP of PhP 61 or a minimum of PhP 49 and a high of PhP 73. Furthermore, since the results were presented to the PAMB, the feedback comments from stakeholders agreed that the values are feasible. Overall, it would be safe to assume that the households within the communities are willing to contribute an amount ranging from a minimum of PhP 30.00 up to as high as PhP 160.00.

Assuming that all households will adhere to the program and pay the estimated mean WTP on their corresponding municipalities, the revenue that can be generated from the municipality of Dolores could reach an amount of PhP 375,544 per month. On the other hand, the revenue from the municipality of Sariaya could reach an amount of PhP 3,054,090 monthly.

The results of the WTP study are also consistent with other studies conducted for watershed management that use water and/or watershed management as the subject such as with Calderon et al. (2013) and Ureta et al. (2016).

While households are willing to pay for the improvement of the water-related ecosystem services, it should be under a certain tangible condition such as they should be able to see the planned activities and the actual implementation. Hence, it is imperative that the supposed sellers are able to present a specific set of activities as part of a community plan for watershed management.

### ***The Sellers' Plan of Action***

In response to the WTP condition of the buyers, potential sellers listed possible activities to be implemented through a community development plan. These activities include converting a portion of their agricultural lands to agroforestry or a tree-based farming system, building nurseries for reforestation and agroforestry seedlings, active participation in reforestation in the protected area, patrolling, and enforcement of laws within the protected area.

Using an activity-based costing method, the overall associated costs for implementing the program were estimated to determine the potential total investment needed. The results amounted to a total of PhP 331,000 per hectare per year to cover for nursery, reforestation, and agroforestry conversion, while an additional PhP 90,000 per hectare per year was allocated to engage farmers in the enforcement activities and patrolling the protected area. Despite these estimates, the total

still does not include the potential loss in incomes of farmers as they transition to tree-based farming practices and other related activities. The estimated costs only included materials, equipment, and labor.

### ***Barriers to Establishing PES in Sariaya and Dolores***

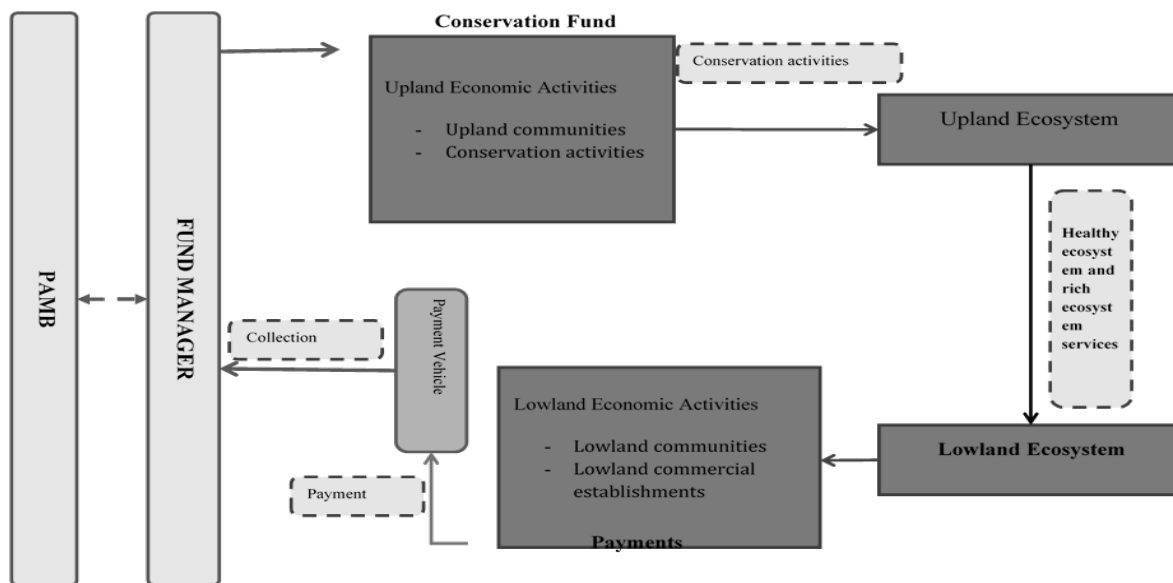
In a post-FGD workshop, when the estimated costs to sellers were presented to the buyers, there was a skeptical reaction to whether the program would be feasible. While the WTP of the buyers is high, it would not be enough to match the high opportunity cost reported by the sellers. Furthermore, a concern for the payment vehicle of the program being the water bill was raised. Due to the current problems experienced by the water districts, rehabilitation plans have already been developed prior to the PES program. Therefore, there are already pending plans to increase the water bills to support the rehabilitation. In this case, it will be a conflict of interest or will be a point of further contention if the PES program uses the water bill as the payment vehicle. Hence, to address this, the study elicited the respondents' preferred payment vehicle for the program. However, even if presented with multiple alternatives, the survey result still shows that stakeholders think that the water bill is still the best option since it is directly relevant to the water-related ecosystem services.

Finally, when the results of the WTP were presented to the municipal council, the councilors were careful to comment and hesitant to accept the results of the study even with high WTP indication from the stakeholders. Since water is a political commodity, it becomes very difficult for politicians to simply augment its price. Hence, even with the rigorous scientific evidences and systematic valuation studies conducted, the success of the collection scheme of the PES is still highly influenced by factors beyond economics. Institutional and sociopolitical dynamics have to be considered and addressed accordingly. Therefore, it is equally important to focus efforts on the negotiation process as well as in the communication of the framework to the entire community.

### **PES: A Way Forward**

PES has a potential to support environmental conservation and protection and in the process maintain the ecosystem and its services through the creation of a market. While it is clear that downstream users





*Figure 6.* PES framework for MBSCPL.

are willing to pay some amounts to improve the provision of water-related ecosystem services, it was also understandable that the stakeholders have some restrictions including in terms of its institutional design. Figure 6 presents a framework for establishing the PES in MBSCPL.

The framework suggests a critical role for PAMB in driving the PES goals. The PAMB is a multisectoral council made up of government and private-sector representatives headed by the PASU. Specifically, the PAMB can serve as the oversight committee to ensure that the PES objectives and activities are implemented properly.

For fund management, the proposed framework suggests the use of an independent entity for several reasons: 1) since the PAMB also oversees the reforestation, conservation, and enforcement efforts in MBSCPL, handling the funds could be seen as a conflict of interest; 2) given the lack of confidence and skepticism of a significant number of stakeholders, an independent fund manager will build confidence in the program; and 3) since the fund managers handle the collection and distribution of the funds, the entity that should take the role must have an audit system in place and can take the logistical responsibilities. PAMB does not have the capacity to handle logistical responsibilities for a strategic program.

The role of the oversight committee and the fund manager are critical to ensure that proper distribution of the funds and appropriate monitoring would be in place

throughout the scheme. These two key elements of the scheme allow for a venue of transparency between all the stakeholders, especially the buyers and the sellers. Transparency within the scheme is a key characteristic to boost the confidence and gather support of even more stakeholders for the PES (Thompson, 2018). Hence, this characteristic, beyond the monetary values and ecosystem service linkages, is a critical factor that needs to be sustained in order for the program to be successfully implemented.

The experience and results from this study may be useful when considering the possibility of expanding the PES program to other towns and communities in the Mounts Banahaw and San Cristobal Protected Landscape. It is apparent from the experience in Sariaya and Dolores that establishing a PES will take some time and a number of iterations. Differences in potential buyers and sellers' WTP and willingness to accept will mean several rounds of negotiations until an agreement will be reached. With this convergence, a PES can be established.

## Endnote

<sup>1</sup>The study and data gathering protocols have been approved by the Ethical Review Board of De La Salle University Manila, through the University Research Coordination Office (URCO).

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