



POLICY BRIEF

A publication of the Policy Advocacy Group (PAG) of the Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD)



Valuing Ecosystem Services: Sustainable Financing Options for Bataan National Park

The Bataan National Park (BNP), a protected area of 20,004 hectares (ha), is home to the Province of Bataan's old-growth forests (Fig. 1). While BNP is a protected area, there is an intense pressure on its natural resources due to illegal settlement and resource use. From 2010 to 2015, the park's built-up areas doubled mainly because of migrants establishing settlements

near their farm (DENR 2020). The Protected Area Management Office (PAMO) also observed that the park's environmental degradation is fueled by human activities, such as the development of agricultural plantations, 'kaingin,' and illegal cutting of trees.

To restore the BNP to its pristine state, an intensive conservation

effort is needed. Hence, various sustainable financing options are proposed, including the development of enterprises capitalizing on legally allowed and commercially-viable bioresources, gradual increase in park entrance fees, and payment for ecosystem services (PES) by both on-site and off-site households.

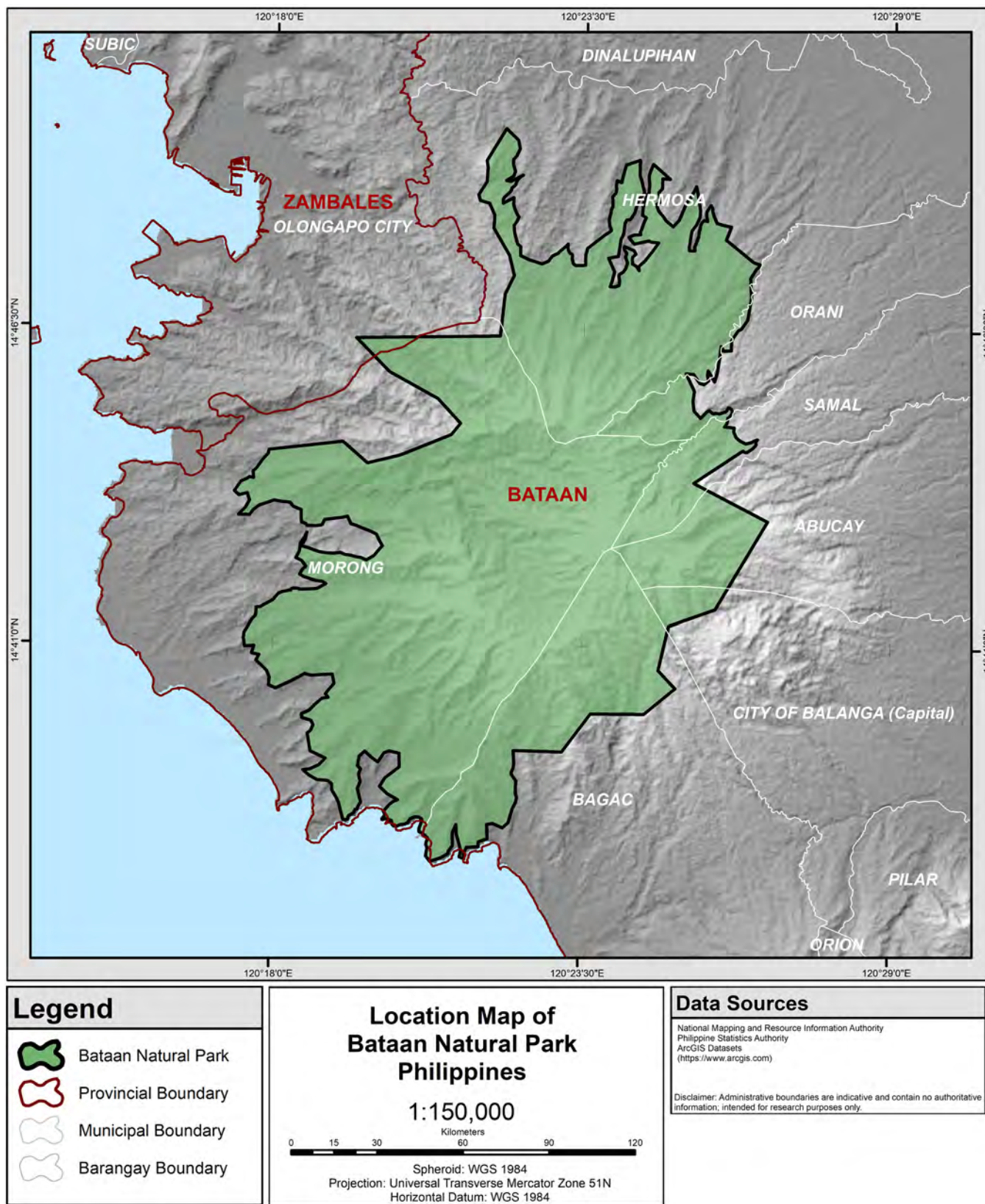


Fig. 1. Location map of BNP.

POTENTIAL FINANCING SOURCES

The forest ecosystems of protected areas provide a wealth of ecosystem services, such as provisioning, regulating, cultural, and supporting that benefit stakeholders and surrounding communities. Tapping people's values for these services may supply protected areas with much-needed funds to conserve their resources. Nevertheless, it requires an equitable sharing arrangement for the benefits derived from the forest ecosystems to ensure participation of all stakeholders in the efforts towards sustainable management of the resource.

Bioresources Utilization

The Expanded National Integrated Protected Areas System Act of 2018 prohibits hunting wildlife and strictly regulates the collection of flora species. However, in BNP, non-timber forest products, such as rattan (*Calamus* sp.) and 'hinggiw' (*Ichnocarpus frutescens*) are discreetly gathered for small-scale trade or for use of national park occupants. The protected area occupants can upscale their production of raw materials or even finished products to supply to businesses selling rattan baskets and furniture without compromising environmental conservation through proper monitoring and transparency in resource utilization.

They also collect and utilize wild medicinal plants such as 'sambong' (*Blumea balsamifera*), 'kalinag' (*Cinnamomum mercadoi*),

'dita' (*Alstonia scholaris*), and 'gugo' (*Entada phaseoloides*). There is a nationwide market for sambong tablets, which is proven to be an effective treatment for urinary tract infection. Production of dried sambong leaves is, therefore, a feasible income-generating activity. Dried sambong leaves can be sold at P300 per kilogram (kg) and supplied to pharmaceutical companies manufacturing sambong tablets. PAMO can partner with these businesses and government agencies toward capacitating local farmers in sambong production.

Wild honey collection is also prevalent inside the natural park. The trade of wild honey is currently small-scale and scattered across the protected area. These small-scale productions can be consolidated and, with proper quality control, marketed commercially outside Bataan.

Venturing in enterprises that capitalize legally-allowed

and commercially promising bioresources, together with proper monitoring of resource utilization, is a promising source of sustainable livelihood for protected area occupants. Revenues may also be shared with the BNP management to fund some of its operations.

Ecotourism Development

BNP has a bounty of natural sceneries that can be developed into tourist destinations. The two most frequently visited ecotourism sites in the park are Ambon-ambon and Lumutan Falls (Figs. 2 and 3), and Tala River. Ambon-ambon and Lumutan Falls are treated as one ecotourism site and are located in Brgy. Banawang in Bagac (Figs. 4 and 5), while Tala River is located in Brgy. Tala in Orani (Fig. 6).

Ambon-ambon and Lumutan Falls are both managed by the Binukawan Bicol Marketing Cooperative (BBMC), while the barangay's local government oversees the Tala River.



Fig. 2. A shot of the Lumutan Falls in the BNP. (BBMC 2015)



Fig. 3. Forest cover at the Ambon-ambon and Lumutan Falls. (BBMC 2021)



Fig. 4. Ambon-ambon Falls in Bagac, Bataan.
(BBMC 2018)

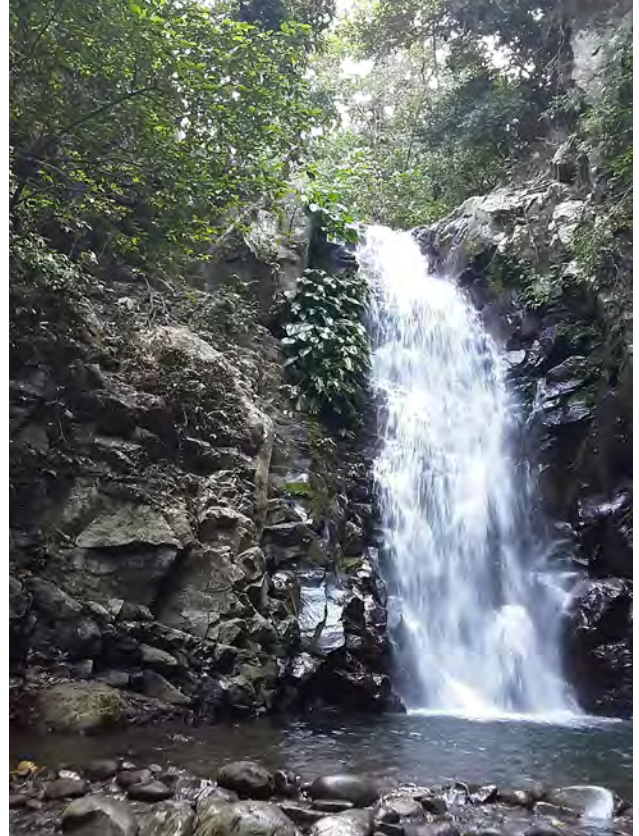


Fig. 5. Lumutan Falls in Bagac, Bataan.
(BBMC 2021)



Fig. 6. Tala River in Brgy. Tala, Orani, Bataan. (UPLB Project Team 2020)

In 2018, 5,457 individuals visited the Ambon-ambon and Lumutan Falls, while 11,765 people went to Tala River, most of whom were locals. Tala River is popular among many locals and tourists for its clear, shallow waters and its 700-step trail that leads to the site.

The value of the recreational services in these sites was determined through travel cost method. In its current condition, the falls and the river provide annual recreational benefits amounting to P3,658,099 and P15,448,033, respectively. Both values greatly exceed the annual cost of maintaining the sites, which is approximately P100,000 for each site.

Survey results revealed that visitors from both sites prefer improvements in the sites' accessibility, safety, and sanitation (waste management and restrooms). On average,

visitors of Ambon-ambon and Lumutan Falls are willing to pay an additional P132 per visit for the improvements, while visitors of Tala River are willing to pay P109 per visit, as a surcharge to the current entrance fee. This is an increase from the current entrance fee rates for the Ambon-ambon and Lumutan Eco-trail (Fig. 7), which ranges from P30 to 50 as locals receive a special discounted rate, while visitors from other areas pay P50 each. Meanwhile, the standard entrance fee for Tala River is P10.

Gradually increasing the entrance fees can finance developments and improve the maintenance of these sites. Promoting these ecotourism sites to visitors from outside the province can further improve revenue generation. Ecotourism can also be used as an avenue for creating awareness about the BNP and its conservation.

Conservation Program through Payment for Ecosystem Services

Households within BNP and its surrounding areas directly and indirectly benefit from its forests' ecosystem services. These services include flood regulation, forest cover, provision of sustainable livelihood opportunities, and biodiversity. Values associated with these ecosystem services were measured through the Choice Experiment. The Choice experiment involved a presentation to off-site and on-site households of a hypothetical scenario wherein a BNP conservation program can lead to different combinations of levels of these services. In this hypothetical scenario, the conservation program will be financed through a surcharge to the household's monthly electric bill.



Fig. 7. Ambon-ambon and Lumutan eco-trail. (Binukawan Bicol Marketing Cooperative 2017)

The Choice experiment revealed that on-site and off-site households have a preference for the conservation of BNP. They are willing to pay P33.30 for high levels of ecosystem services through a surcharge to their monthly electric bill. An annual charge of P399.60 from each of the residents' electric bills will yield approximately P69 million (M). This value exceeds the total annual income generated from extracting flora and fauna species inside the park. However, a BNP conservation program that leads only to medium levels of these ecosystem services benefits was not appealing to households. Households were not willing to pay and preferred the status quo instead. Thus, government agencies should implement conservation programs rigorously to ensure that high levels of biodiversity, flood mitigation, sustainable livelihood provision, and forest cover targets are delivered.

On-site and off-site households associate the highest values for improvements in the conservation program components that were public good in nature, specifically forest cover and flood mitigation. Respondents were also willing to trade off improvements in flood mitigation for improvements in forest cover. This means that conservation programs should target high levels of improvements focused on expanding the forest area and strengthening flood regulation services.

RECOMMENDATIONS/WAYS FORWARD

The BNP has seen environmental degradation, but it is not yet too late to restore and conserve it. Thus, the following efforts are proposed to initiate a financially sustainable conservation program.

Enterprise Development and Business Planning

Protected area occupants can be organized into groups that can make sustainable businesses out of legally-allowed bioresources. Existing policies that allow sustainable use of bioresources for holders of tenure instruments, such as the Protected Area Community-based Resource Management Agreement and the National Greening Program contracts are available for tenured occupants. Government agencies can partner with the private sector to develop the products' business aspect from these areas. Development of a detailed management and harvesting plan following the principle of sustained-yield, transparency in resource extraction, and proper monitoring is essential to prevent overuse and damage to the environment.

Institutionalize PES

Given the significant values of non-marketed benefits that forest ecosystems provide, it is feasible to fund the conservation program through developing payment

for ecosystem services. The academe, national government agencies, and non-government organizations can conduct action research to support PES implementation.

Valuation of other ecosystem services, such as water provision, should be done. BNP has abundant water resources with values that may also be tapped for the protected area's sustainable financing.

Capacitate Protected Area Occupants

Human activities have been identified as a major cause of BNP's environmental degradation. However, treating occupants as culprits or ignoring their existence will not solve the ecological problems arising from their dependence on the park's natural resources. Providing protected area occupants with forest protection functions and sustainable livelihood opportunities will replace destructive activities. Thus, it will mutually benefit both the protected area management and occupants. Further, the establishment of a conservation program with a livelihood component will empower them as responsible partners in forest conservation.

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EDITOR'S NOTE

This policy brief is based on results of the PCAARRD-funded project “Valuing Bioresources and Recreational Services for Access and Benefit Sharing and Payment for Ecosystem Services: The Case of Bataan National Park.” The project was implemented by the Interdisciplinary Studies Center for Integrated Natural Resources and Environment Management of the University of the Philippines Los Baños (UPLB) in partnership with the Protected Area Management Office of BNP, Department of Environment and Natural Resources—Region III, and the Biodiversity Management Bureau. The (UPLB) project team was composed of Dr. Juan M. Pulhin, Dr. Canesio D. Predo, Dr. Asa Jose U. Sajise, Dr. Catherine C. De Luna and Ms. Arielle R. Fajardo.

POLICY BRIEF is a quarterly publication of the Policy Action Group (PAG) of DOST-PCAARRD that highlights the Council’s stance on policy issues on S&T in agriculture, aquatic, and natural resources.

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