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# Fiscal Gap and Financing Protected Areas in the Philippines

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WorldFish

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Alexander D. Anda, Jr.

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| | |
|---|---|
| ARMM | Autonomous Region in Muslim Mindanao |
| CENRO | Community Environment and Natural Resources Office |
| CO | Capital Outlay |
| DENR | Department of Environment and Natural Resources |
| DENR R1to R13 | DENR Regional Office No. |
| GRBS | Games Refuge and Bird Sanctuary |
| ha | hectare/s |
| IUCN | International Union for Conservation of Nature |
| LGUs | Local Government Units |
| MOOE | Maintenance and Other Operating Expenses |
| MSFR | Mangrove Swamp Forest Reserve |
| N.P. | National Park |
| NBA | Natural Biotic Area |
| NGOs | Non-Governmental Organizations |
| NIPAS | National Integrated Protected Areas System |
| NM | Natural Monument |
| NP | Natural Park |
| PA | Protected Area |
| PAMB | Protected Area Management Board |
| PAO | Protected Area Office |
| PAs | Protected Areas |
| PASu | Protected Area Superintendent |
| PAWB | Protected Areas and Wildlife Bureau |
| PAWS | Protected Areas and Wildlife Service |
| PAWCZM | Protected Areas, Wildlife and Coastal Zone Management |
| PENRO | Provincial Environment and Natural Resources Office |
| PLS | Protected Landscape/Seascape |
| POs | Peoples' Organization |
| PS | Personnel Service |
| RED | Regional Executive Director |
| RR | Resource Reserve |
| RTD | Regional Technical Director |
| WA | Wilderness Areas |
| WCPA | World Commission on Protected Areas |
| WFR | Watershed Forest Reserve |

# FISCAL GAP AND FINANCING PROTECTED AREAS IN THE PHILIPPINES

Alexander D. Anda, Jr.
and Marlon M. Atienza

## EXECUTIVE SUMMARY

This study is part of the cross-country analysis of the fiscal and resource gap of protected areas in the South East Asian region. It focused on the protected areas in the Philippines that are under the jurisdiction of the Department of Environment and Natural Resources (DENR). Using mail and field interviews of the Protected Area Superintendent (PASu) or senior DENR officials, the study looked into the extent of internal and external threats to protected areas (PA) in 16 regions of the country as represented by the population of settlements outside PAs, inhabitants within PAs, number of visitors, and length of roads and trails. The management responses to these threats, indicated by the number of staff filled up by the DENR and the budget allocated by the national government, were also examined.

As small areas received more budget and staff per hectare than big areas, we grouped the PA respondents into four clusters or sizes: small, medium, large, and very large. The average and highest values for staff per 1000 ha and expense per hectare were obtained per cluster. If we are to bring the below-average PAs to cluster average, and the above-average PAs to the highest cluster value, we computed that, in 2009, the DENR had a shortfall of 411 staff and USD2.34 million in expenses for the 79 benchmarked PAs.

However, increasing staff and budget is saddled by contemporary problems like restriction in hiring of new staff, depletion of current DENR staff, and insufficient fees or revenue collections. To remedy this predicament, it is recommended that the DENR pursue the enactment of PA mandates or enabling laws for each PA to include the organization and staffing pattern that it will use as well as for DENR or PAs to pursue the following, among others: a) contract out management or to co-manage the PA with interested local government units; b) pursue a continuing capacity building program for PASu, PA staff, and PA Management Board (PAMB) members; c) establish a transparent and adequate collection system and other management systems; d) upgrade the general entrance fee and other charges set in 1995 using the cost recovery and 'willingness-to-pay' principles; and e) allocate budget to individual PAs instead of lump sum appropriation to the regional office.

## 1.0 INTRODUCTION

### 1.1 Description of the Problem

Protected areas (PA) in the Philippines are defined by law as identified portions of land and water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploitation. As of 2009, PAs cover no less than 238 terrestrial and marine sites across the country, representing distinct bio-geographical regions. However, only about 110 sites are proclaimed or officially included in the National Integrated Protected Areas System (NIPAS) pursuant to Republic Act No. 7586, otherwise known as the 'NIPAS Act of 1992'. More than half of the total PA sites, under the initial components, remain to be assessed according to predetermined suitability criteria until these potential sites are either proclaimed under NIPAS or disestablished by law. This is a gargantuan task that may take two more decades to complete due to inadequate budgetary allocation from the government.

The conservation objectives in all designated PAs of NIPAS are to maintain essential ecological processes and life-support systems, to preserve genetic diversity, to ensure sustainable use of resources found therein, and to maintain their natural conditions to the greatest extent possible. It is expected that NIPAS shall encompass outstandingly remarkable areas and biologically important public lands that are

habitants of rare and endangered species of plants and animals, biogeographic zones, and related ecosystems.

In pursuit of these objectives, and in consideration of the natural features and allowable human activities in proclaimed PAs, these PAs are categorized by law into: a) strict nature reserve, b) natural park, c) natural monument, d) wildlife sanctuary, e) protected landscapes and seascapes, f) resource reserve, g) natural biotic areas, and h) other categories as established by law, conventions or international agreements (Table 1).

**Table 1.** Summary of Philippine PAs, 2009

| NIPAS Category | Number of Sites | Area (hectares) |
|---|---|---|
| Strict Nature Reserve | 0 | 0 |
| Natural Park | 28 | 1,173,573 |
| Natural Monument | 4 | 23,741 |
| Wildlife Sanctuary | 9 | 294,502 |
| Protected Landscape/ Seascape | 56 | 1,774,781 |
| Resource Reserve | 7 | 170,083 |
| Natural Biotic Area | 4 | 11,457 |
| Others | 2 | 89,157 |
| Under NIPAS assessment process (initial components) | 128 | 1,880,629 |
| **Total All PAs** | **238** | **5,417,924*** |

*Note: Some PA areas remain undetermined, especially those with marine/seascape components.

Since the establishment of the NIPAS, the management of these PAs in the 16 regions of the country have faced birthing pains such as lack of financial resources and personnel to carry out the conservation tasks. Each PA continues to experience different levels of habitat degradation, incompatible land degradation, and overharvesting or utilization of natural resources, which are also aggravated by the growing population (2.04% annual growth estimate). All of these exert persistent but varying degrees of internal and external pressures on the PAs.

However, there has been no clear, specific, and purposeful assessment of the resource gaps and other problems besetting individual PAs. While the profile and characteristics of individual PAs are unique, benchmarking could be helpful in comparing PAs to one another. Without this information, it would be difficult for the government to prioritize and distribute its limited resources for the task of conservation. Hence, this situation persists and has not been adequately addressed in a more responsive manner.

## 1.2 Research Objectives

The overall objective of this study is to determine the resource gaps in the management of PAs in the Philippines. The specific objectives include the following:

a) Provision of a detailed and comprehensive description of the various PAs in the Philippines;

b) Analysis of the internal and external pressures brought upon PAs, using a common set of indicators;

c) Analysis of the management response (resource allocation) across the various PAs of the Philippines;

d) Assessment of the extent of the resource gap experienced by PAs;

e) Analysis of the existing fiscal structure, including an assessment of the characteristics of the existing user fee structures; and

f) Assessment of the various options aimed at addressing the identified resource gap.

## 1.3 Review of Literature

There is a dearth of literature on resource gap and financing of PAs in the Philippines. Anda (2006) studied the Philippines' Integrated Protected Areas Fund (IPAF) and examined the institutional and operational issues attendant to its establishment and operation. He noted that only a third of the PAs in 2006 were earning IPAF revenues. Two-thirds did not generate any revenue while all PAs depended on the yearly budget allocated by the national government.

Bruner *et al.* (2004) evaluated the cost of effectively managing all existing PAs in developing countries as well as the cost of expansion into new high priority areas. They found that recent studies converge on a funding shortfall of USD1 billion to USD1.7 billion per year to manage all existing areas. The costs of establishing and managing an expanded PA system would total at least USD4 billion per year over the next decade, an amount that far exceeds current spending but is well within the reach of the international community. These findings indicate the need for rapid action to mobilize significant new resources for the developing world's PAs.

The IUCN-The World Conservation Union (2000) published "Financing Protected Areas: Guidelines for Protected Area Managers", which demonstrates the importance of developing a financial strategy, discusses the mechanisms for generating revenue flows from both public and private sources, and gives an overview of potential grant-based sources of financing. A related paper entitled "Guidelines for Financing Protected Areas in East Asia" (IUCN-World Commission on Protected Areas 2001) enumerates various financial mechanisms, process of assessing the feasibility of funding options, and recommends steps in developing a financial plan. Flores *et. al* (2008) provided guidelines and lessons to optimize both the financial planning processes of PAs and the products resulting from these processes. On the other hand, Bovarnick (2008) proposed a financial scorecard to investigate and record significant aspects of a PA financing system, its accounts and its underlying structural foundations, to show both its current health and status, and to indicate if the system is holistically moving over the long-term towards an improved financial situation.

Haeruman (2001) proposed a new paradigm for national park financing in Indonesia through a mechanism that assigns costs to those who accrue benefits, works toward conservation goals within individual parks, and considers the overall objectives of the park system. He also enumerated several alternative-financing mechanisms similar to that of IUCN- World Commission on Protected Areas guidelines.

James (1999) noted a disparity on budgetary resources between developing and developed countries (i.e., USD157/ $km^2$ vs. USD2,058/$km^2$), where the developing countries' budgets to meet their stated conservation objectives are less by 92%. He also noted that the global distribution of staffing is much more comparable than for operating budgets; developing countries have a staffing ratio of 27.6 per 1,000 $km^2$ while developed regions have 26.9 per 1,000 $km^2$. James (1999) also looked into the World Conservation Monitoring Centre (WCMC) findings with regard to the regional cost of PA conservation and found that developing countries have unmet financial needs of USD2.6 billion annually. This corresponds to an additional USD350/$km^2$ in expenditures, which would increase the mean developing country PA budget from USD157/$km^2$ to USD507/$km^2$. Clearly, an additional amount would be required to achieve adequacy in the PA budgets of developing countries. One solution offered is to allow the PA agencies to retain the revenues raised from different sources and achieve financial autonomy. This requires institutional change at various levels, including the corporate culture and the attitude of resource users.

James *et al.* (1999) confirmed that countries with high biodiversity tend to spend less on their PA systems. They also noted that PA conservation costs vary considerably by region, and these are positively related to economic development levels, population pressure and degree of PA fragmentation. They also concluded that many of the developing countries appear to have well-staffed PA agencies despite their relatively meager budgets. This suggests that, despite the lack of funds, developing countries do make a valuable contribution to global protection, which could be greatly enhanced by donor funding to develop existing institutional capacity.

# 2.0 RESEARCH METHODS

## 2.1 Description of Specific Tasks

### *Part 1 Description of PAs and legislative instruments*

a) Description of the legislative framework enabling the creation of PAs. This description included PAs under national jurisdiction as well as those of other jurisdiction, where appropriate. It also included a description of the key characteristics which, in legislative documents, differentiate these PAs.

b) Description of the institutional framework pertaining to the management of PAs at both the national and local levels, where appropriate.

c) Listing of all PAs in the country along with a short description of each PA. At a minimum, this description included:

   i. Year of establishment of each PA;

   ii. Area (hectares) of each PA, then aggregated at the level of state or province, and then aggregated at the country level;

   iii. Percent of PA relative to state (province) area and national area;

   iv. Number of hectares of PA per 1,000 of state (province) population and national population; and

   v. Number of hectares of PA per USD1 million of state and national GDP.

### *Part 2 Indicators of internal and external pressure*

a) Preparation of a survey format which was distributed to all PAs to identify and quantify the types and extent of internal and external pressures experienced by the PAs.

b) Calculation and analysis of indicators to assess the nature and extent of the internal and external pressures. Indicators included the following:

*External pressure:*

i. Population within a 5 km radius of the PA;
ii. Population within a 5 km radius of the PA per hectare of PA;
iii. Number of hotel rooms within a 500 m radius of the PA; and
iv. Number of hotel rooms within a 500 m radius of the PA per hectare of PA.

*Internal pressure:*

i. Inhabitants within PAs
ii. Percent of the PA close to the public;
iii. Total number of visitors to each PA;
iv. Total number of visitors to the PA per hectare of PA;
v. Total number of visitors who stayed one or more nights within the PA;
vi. Number of kilometers of driving roads per 1,000 ha of PA; and
vii. Number of kilometers of hiking trails per 1,000 ha of PA.

### *Part 3 Resource gap analysis*

a) Preparation of a survey format which was distributed to all PAs to identify and quantify the types and extent of resources made available to each PA.

b) Calculation and analysis of indicators to assess the nature and extent of the existing resource allocation. Indicators included the following:
   i. Total number of PA staff;
   ii. Number of PA staff per 1,000 ha of PA;
   iii. Number of PA staff per 1,000 visitors to the PA;
   iv. Number of PA staff per 1,000 population within 5 km radius of the PA;

v. Total number of enforcement staff;
vi. Number of enforcement per 1,000 visitors;
vii. Number of enforcement staff per 1,000 ha of PA;
viii. Number of enforcement staff per 1,000 visitors to the PA;
ix. Number of enforcement staff per 1,000 population within 5 km radius of the PA;
x. Total annual operating expenses;
xi. Operating expenses per 1,000 ha of PA; and
xii. Operating expenses per 1,000 visitors.

c) Based on the best practice in the region and internationally, the research team assessed the extent of the gap faced by PAs in terms of both staffing and operational budget.

***Part 4 Financing of protected areas***

a) Detailed description of the existing fee structure and fee levels used by the PAs.

b) Assessment of the internal sources of revenues generated by each PA from both entrance fees and various types of user fees.

c) Assessment of key issues and recommendations.

## 2.2 Limitation of the Study

This study does not compare PAs in terms of their effectiveness or efficiency. It mainly compared PAs against national benchmarks using data from the survey.

# 3.0 METHODOLOGY

## 3.1 Scope of the Study and Site Selection

This study covers all PAs that are under DENR's jurisdiction, including all those officially proclaimed under the NIPAS law as of 2009 and the remaining 118 PAs under the initial component of NIPAS. From the total list of 238 PAs (Table 1), excluded from the study are those under the jurisdiction of the Autonomous Region of Muslim Mindanao (ARMM) and other government agencies like the Philippine Tourism Authority (PTA), National Power Corporation (NPC), and the National Parks Development Council (NPDC). The 222 PAs covered in this study are summarized and described in Table 2. Of the 222 PAs sent interview questionnaires through mail, 89 responded before the deadline but only 81 PAs will be included in the analysis. Eight were excluded because of missing data on land area and staff, or were solely marine PAs.

**Table 2.** Summary of PAs included in the study

| NIPAS Category | Number of sites for mail interview | Number of samples for field interview |
|---|---|---|
| Natural Monument (NM) | 4 | 1 |
| Natural Park (NP) | 26 | 3 |
| Resource Reserve (RR) | 7 | 1 |
| Wildlife Sanctuary (WS) | 7 | 1 |
| Protected Landscape/ Seascape (PLS) | 55 | 6 |
| Natural Biotic Area (NBA) | 4 | 1 |
| Others | 2 | 1 |
| Under NIPAS assessment (initial component) | 118 | 11 |
| **Total** | **222** | **25** |
| **PAs that responded** | **89** | **23** |
| **PAs included in analysis** | **81** | |

## 3.2 Approach

### 3.2.1 Consultation with DENR

Before the project began, formal letters were sent to the DENR and the Protected Areas and Wildlife Bureau (PAWB) offices to introduce the project and to officially request approval and assistance in the conduct of the study. An initial briefing and consultation was undertaken with senior officials of DENR and PAWB about the study. Comments and suggestions were taken into consideration in modifying the study.

### 3.2.2 Secondary data collection

Prior to the survey, secondary data were collected from relevant agencies and offices such as the DENR-PAWB and the National Census and Statistics Board.

### 3.2.3 Primary data collection

Two kinds of questionnaires were prepared: one short version for mail interview and another version for field interview. All PAs were targeted for mail interview and 25 PA-respondents were further selected for face-to-face/field interview. Mail interview forms addressed to every PA in the 16 DENR regions of the country were sent to their Regional Executive Director (RED) through the Regional Technical Director for Protected Areas, Wildlife and Coastal Zone Management Service (RTD-PAWCZMS). In turn, the RTD-PAWCZMS sent these forms to the Protected Area Superintendent (PASu) of each PA under their supervision. Subsequent follow-ups thru phone or email were also made at the regional level, and selectively at PASu level, especially to clarify and/or complete some answers.

The selection of PAs for face-to-face/field interview was based on the proportional representation and distribution of the PAs according to category, and these were selected through random sampling. Two hundred twenty-two (222) PAs were sent questionnaires for mail interview and 25 PAs for field interview. Of these, 89 and 23 PAs responded, respectively. Respondents were assured anonymity and were told that only aggregate findings of the study would be published.

### 3.2.4 Data analysis

All data collected were collated and tabulated, and comparative analysis was undertaken. Pressure and response indicators were normalized by dividing these indicators with appropriate units of measure. For instance, to normalize the number of staff, the PA staff was divided by the total area of PA and multiplied by 1000 ha to get the staff per 1000 ha.

### 3.2.5 Validation and presentation of findings

The initial results of the study were sent to PAWB, DENR regions and survey respondents though e-mail for comments or suggestions. However, no response was received.

With the invitation of the PAWB Director, the study was presented in two fora:

a) the PAWB Senior Staff Meeting on 29 November 2011 at Sulo Hotel, Quezon City; and

b) the 3rd National Protected Area Management Board Summit on 28 June 2012 at Torre Venezia Suites, Quezon City.

# 4.0 RESULTS AND DISCUSSION

## 4.1 Description of Philippine PAs and their Legislative Framework

### 4.1.1 Legislative framework and jurisdiction of PAs

The NIPAS Act of 1992, which took effect on 5 August 1992, served as the main national law on PA management in the Philippines. Following the framework outlined in NIPAS Act, specific laws or mandate creating or establishing a particular PA have also been promulgated such as Republic Act (RA) 8978 (Mt. Kitanglad Range Protected Area Act), RA 8991 (Batanes Protected Area Act), RA 9106 (Sagay Marine Reserve Law), RA 9125 (Northern Sierra Madre Natural Park Act), RA 9303 (Mt. Hamiguitan Range Wildlife Sanctuary Act), RA 9304 (Mt. Malindang Range Natural Park Act), RA 9486 (Central Cebu Protected Landscape Act), RA9494 (Mimbilisan Protected Landscape Act), and RA10067 (Tubbataha Reefs Natural Park Act). PAs not created by a specific law were established through Presidential Proclamations issued in pursuance of the NIPAS Act. Most PAs (93%) under NIPAS are under the national-level DENR jurisdiction, while the rest are under specialized government agencies (Table 3).

**Table 3.** Regional distribution and jurisdiction of all Philippine PAs

| Region | Number of PAs per agency with administrative jurisdiction | | | | | Total |
|---|---|---|---|---|---|---|
| | DENR | National Parks Development Council | National Power Corp. | Philippine Tourism Authority | Public Estate Authority | |
| 1 (Ilocos) | 14 | | | 1 | | **15** |
| 2 (Cagayan Valley) | 15 | | | | | **15** |
| 3 (Central Luzon) | 23 | | 1 | | | **24** |
| 5 (Bicol) | 25 | | | | | **25** |
| 6 (Western Visayas) | 14 | | | | | **14** |
| 7 (Central Visayas) | 19 | | | | | **19** |
| 8 (Eastern Visayas) | 11 | | | | | **11** |
| 9 (Zamboanga Peninsula) | 13 | | | | | **13** |
| 10 (Northern Mindanao) | 12 | | | | | **12** |
| 11 (Davao) | 9 | | | | | **9** |
| 12 (SOSSCKSARGEN) | 5 | | | | | **5** |
| 13 (Caraga) | 11 | | | | | **11** |
| 4A (CALABARZON) | 20 | | | 1 | | **21** |
| 4B (MIMAROPA) | 23 | | | | | **23** |
| ARMM | 11 | | | | | **11** |
| CAR (Cordilleras) | 7 | | | | | **7** |
| NCR (National Capital) | 1 | 1 | | | 1 | **3** |
| **Total** | **233** | **1** | **1** | **2** | **1** | **238** |

### 4.1.2 Institutional and management framework

At the national level, the NIPAS is placed under the control and supervision of the DENR. At the regional level, the DENR Protected Area and Wildlife Division/Service (which is under the supervision of the Regional Technical Director) in the regions where PAs have been established is tasked to 'manage protected areas and promote the permanent preservation, to the greatest extent possible, of their natural conditions'.[1]

At the local level, the site-specific management and/or policy making body of each PA is lodged in its Protected Area Management Board (PAMB), which consists of the following: a) the Regional Executive Director under whose jurisdiction the PA is located, and who also acts as chairman of the Board; b) one

[1] Section 10 of RA 7586

representative from the autonomous regional government, if applicable; c) the Provincial Development Officer; d) one representative from the municipal government; e) one representative from each barangay covering the PA; f) one representative from each tribal community, if applicable; g) at least three representatives from non-government organizations (NGOs) or local community organizations; and h) if necessary, one representative from other departments or national government agencies involved in PA management.[2] The PASu serves as the PA's chief operating officer and is 'primarily accountable to the PAMB and the DENR for the implementation of the Management Plan and operations of the protected area'.[3]

It is worth noting that there are PAs under the DENR that are under co-management with local government units (LGUs) or which the DENR contracted out the management to LGUs, such as those observed in Caramoan National Park, Calauit Safari Park, and Great and Little Sta. Cruz Islands Protected Landscape and Seascape. In these exceptional cases, the LGU takes an active role in PA management and development, including investment in infrastructure and staff to boost local ecotourism.

### 4.1.3 Listing of PAs under DENR administrative jurisdiction

The DENR represents the national government and the state in administering and managing PAs across the country. With the exception of ARMM, the DENR has regional offices in 16 regions and is technically supported by a central staff bureau, the PAWB, in its function as NIPAS administrator and supervisor. The ARMM PAs are a peculiar case as they fall under the administrative jurisdiction of DENR, not ARMM. As such, there is no clear DENR regional office which has authority over the ARMM PAs. For the purpose of this study, the 11 ARMM PAs were excluded and only 222 PAs were considered for the study.

Table 4 lists PAs under DENR administrative jurisdiction by NIPAS category per region and administrative jurisdiction. Protected Landscape/Seascape (PLS) is the most common PA type in the country (24%), with the exception of PAs under process for NIPAS inclusion which account for more than half (54%) of the Philippine PAs. This is followed by Natural Park (NP) (12%), Wildlife Sanctuary (WS) (4%), Resource Reserve (RR) (3%), Natural Biotic Area (NBA) (2%), and Natural Monument (NM) (2%).

**Table 4.** PAs under DENR jurisdiction by NIPAS category per region

| Region | Administrative jurisdiction | NIPAS Category | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NBA | NM | NP | PLS | RR | WS | Others | Under process | |
| CAR (Cordilerras) | DENR CAR | | | | | 1 | | | 6 | **7** |
| 1 (Ilocos) | DENR Region 1 | | 1 | 1 | 6 | | | | 6 | **14** |
| 2 (Northern Luzon) | DENR Region 2 | | 1 | 1 | 5 | 1 | | | 7 | **15** |
| 3 (Central Luzon) | DENR Region 3 | | | | 5 | 1 | | | 17 | **23** |
| NCR (National Capital) | PAWB | | | | | | | 1 | | **1** |
| 4A (CALABARZON) | DENR Region 4A | | | | 7 | | | | 12 | **19** |
| | PAWB | | | | 1 | | | | | **1** |
| 4B (MIMAROPA) | DENR Region 4B | | | 4 | 2 | | 3 | 1 | 13 | **23** |
| 5 (Bicol Region) | DENR Region 5 | 2 | | 5 | 1 | | 2 | | 15 | **25** |
| 6 (Western Visayas) | DENR Region 6 | | | 4 | | 2 | | | 8 | **14** |
| 7 (Central Visayas) | DENR Region 7 | | 1 | 1 | 7 | | | | 10 | **19** |
| 8 Eastern Visayas) | DENR Region 8 | | | 3 | 4 | | | | 4 | **11** |
| 9 (Zamboanga Peninsula) | DENR Region 9 | 2 | | 1 | 7 | 1 | 1 | | 1 | **13** |
| 10 (Central Mindanao) | DENR Region 10 | | 1 | 5 | 3 | | | | 3 | **12** |
| 11 (Davao) | DENR Region 11 | | | 1 | 5 | | 1 | | 2 | **9** |
| 12 (SOCCSKSARGEN) | DENR Region 12 | | | | 2 | | | | 3 | **5** |
| 13 (Caraga) | DENR Region 13 | | | | 1 | 1 | 1 | | 8 | **11** |
| ARMM | To be determined | | | | | | | | 11 | **11** |
| **Total** | | **4** | **4** | **26** | **56** | **7** | **8** | **2** | **126** | **233** |
| **Distribution (%)** | | **2** | **2** | **11** | **24** | **3** | **3** | **1** | **54** | **100** |

[2] Section 11 of RA 7586.
[3] Sec. 11.7 of DENR DAO No.2008-26

Table 5 indicates the regional distribution of PA land area, including their relative ratio to the total land area, population, and 2009 budget allocation by region. At the national level, PAs take up 18% of the total land area and about 67 ha per population of 1000. Based on the 2009 national budget allocation, PA management and operation received an average amount of PhP75.95 (USD1.60) per hectare, excluding the ARMM area which has a separate lump sum allocation. It must be noted that only the land area of the PAs were considered; water/marine areas were not included to be consistent in data treatment.

**Table 5.** Regional distribution of PAs by area and population

| Region | Total land area (ha)* | Area of PAs (ha) | % of total land area | 2007 population (1000)** | PA area (ha) per 1000 population | 2009 budget*** (in PhP million) | 2009 budget/ha (PhP) |
|---|---|---|---|---|---|---|---|
| CAR | 1,829,368 | 141,427 | 8% | 1,219 | 116 | 12.47 | 88.14 |
| 1 | 1,284,019 | 24,759 | 2% | 4,546 | 5 | 9.66 | 390.16 |
| 2 | 2,687,517 | 998,521 | 37% | 3,286 | 304 | 11.10 | 11.12 |
| 3 | 2,147,036 | 283,247 | 13% | 9,179 | 31 | 13.91 | 49.10 |
| NCR | 63,600 | 504 | 1% | 11,553 | 0.04 | 20.43 | 40,527.78 |
| 5 | 1,622,861 | 58,508 | 4% | 11,507 | 12 | 14.29 | 244.21 |
| 4A | 2,745,601 | 134,888 | 5% | 2,349 | 674 | 33.13 | 245.60 |
| 4B | 1,763,249 | 1,583,500 | 90% | 5,110 | 11 | 51.30 | 32.40 |
| 6 | 2,022,311 | 218,475 | 11% | 5,925 | 37 | 31.81 | 145.60 |
| 7 | 1,489,077 | 95,097 | 6% | 4,989 | 19 | 38.52 | 405.02 |
| 8 | 2,143,169 | 453,163 | 21% | 3,913 | 116 | 9.03 | 19.93 |
| 9 | 1,599,734 | 293,966 | 18% | 2,368 | 124 | 7.24 | 24.62 |
| 10 | 1,714,803 | 103,258 | 6% | 3,090 | 33 | 26.10 | 252.78 |
| 11 | 1,967,183 | 91,753 | 5% | 2,793 | 33 | 29.80 | 324.80 |
| 12 | 1,874,946 | 383,120 | 20% | 3,040 | 126 | 8.40 | 21.93 |
| 13 | 1,884,697 | 369,440 | 20% | 1,995 | 185 | 6.16 | 16.67 |
| ARMM | 1,160,829 | 184,298 | 16% | 4,121 | 45 | no data | |
| **Philippines** | **30,000,000** | **5,417,924** | **18%** | **80,984** | **67** | **323.33** | **75.95** |

*Source: National Mapping and Resource Information Authority
**Source: GRDP-Gross Regional Domestic Product data taken from National Statistical Coordination Board website
***Source: 2009 Government Appropriation Act

## 4.2 Pressures and Management Responses

### 4.2.1 External pressures

The external pressures are indicated by: a) the population within 5 km from the boundary of the PA and b) the presence of hotels within a 500 m radius from the PA. In terms of external threat occasioned by the population of settlements within 5 km from the PAs, NCR and Region 2 ranked first and second, respectively, in terms of the highest average population per hectare (Table 6). However, it is surprising to note that the NCR received the highest budgetary allocation per hectare (PhP40,527.78/ha), while Region 2 received the lowest budgetary appropriation per hectare (PhP11.12/ha) (Table 5). Only 7 out of 81 (8%) PAs have hotels within a 500 m radius. Whether or not these impose or alleviate threats to PAs remains to be seen.

Using IUCN categories, Category II (National Parks) has the densest population of settlements per hectare of PAs (791/ha) followed by Category V (Protected Landscape/Seascape) (517/ha) (Table 7). Category V also offers the most number of visitors that can be accommodated within 500 m from the PAs (1,635 visitors per 1000 ha). PAs under Category II appear to be the most threatened by their surrounding population and would generally require more staff and budget to address these external threats.

**Table 6.** Population within 5 km and visitors that can be accommodated by hotels within a 500 m radius from PAs, by region

| Region | Land area of PAs (n=81) | Average population of settlements | Average population/ha of PAs | No. of visitors that can be accommodated by hotels outside of PAs | Average no. of visitors that can be accommodated/ 1000 ha of PAs |
|---|---|---|---|---|---|
| 1 | 12,342 | 4,985 | 21.25 | - | |
| 2 | 354,724 | 23,819 | 1,217.89 | 125 | 15 |
| 3 | 121,665 | 9,738 | 277.91 | - | |
| 5 | 37,798 | 104,196 | 33.82 | - | |
| 6 | 24,575 | 8,600 | 27.35 | - | |
| 7 | 30,656 | 16,990 | 22.85 | 20 | 19 |
| 8 | 333,767 | 104,820 | 94.10 | - | |
| 9 | 6,006 | 29,433 | 429.05 | - | |
| 10 | 112,161 | 17,208 | 539.61 | - | |
| 11 | 201 | 53,931 | 268.71 | - | |
| 12 | 101,982 | 45,752 | 0.45 | 500 | 5 |
| 13 | 142,586 | 35,951 | 3.66 | - | |
| 4A | 1,580 | 25,156 | 650.85 | 50 | 336 |
| 4B | 171,163 | 30,796 | 125.06 | - | |
| CAR | 58,354 | 661,785 | 126.11 | 20 | 15 |
| NCR | 23 | 196,572 | 8,546.61 | 142 | 6,174 |
| **Philippines** | **1,509,582** | **73,028** | **382.67** | **857** | **940** |

**Table 7.** Population within 5 km and visitors that can be accommodated by hotels within a 500m radius from PAs, by IUCN category

| IUCN Category | PA land area (n=81) | Population of settlements within 5 km | Ave. pop. of settlements/ ha of PAs | No. of visitors that can be accommodated by hotels outside of PAs | Visitors that can be accommodated/ 1000 ha of PAs |
|---|---|---|---|---|---|
| Ib (Wilderness Area) | 430 | - | - | - | - |
| II (National Park) | 461,010 | 1,214,414 | 791 | - | - |
| III (Natural Monument) | 52,715 | 16,117 | 1 | - | - |
| IV (Habitat/Species Management Area) | 183,778 | 3,668,115 | 70 | 90 | 13 |
| V (Protected Landscape/Seascape) | 689,523 | 903,121 | 517 | 767 | 1,635 |
| VI (Managed Resource Protected Area) | 122,126 | 40,502 | 150 | - | - |
| **Philippines** | **1,509,582** | **5,842,269** | **383** | **857** | **940** |

### 4.2.2 Internal pressures

The indicators of internal pressures are the: a) number of inhabitants within the PAs, b) number of PA visitors, and c) number of kilometers of driving roads and hiking trails inside the PAs. The average number of PA inhabitants ranges from 30 to 96,502 persons, and the mean is estimated at 7,618 persons per PA. This presents a real challenge in PA management as the population pressure within PAs increases with time, unless effective interventions are put in place. As to population density, the national average of inhabitants per 1000 hectares is 1,093 persons. PAs also received an average of 4,152 visitors per year or 10.77 visitors per hectare, after excluding an apparent outlier (Table 8).

**Table 8.** PA inhabitants and visitors of PAs, by region

| Region | Average no. of inhabitants | Average no. of inhabitants/1000 ha | Average no. of visitors | Average visitors/ha |
|---|---|---|---|---|
| 1 | 126 | 106 | 2,038 | 2.06 |
| 2 | 1,892 | 32 | 654 | 43.41 |
| 3 | 1,150 | 14 | 1,850 | 0.02 |
| 5 | 1,817 | 367 | 432 | 4.31 |
| 6 | 4,000 | 164 | 261 | 0.01 |
| 7 | 789 | 4,608 | 28,393 | 55.04 |
| 8 | 12,278 | 174 | 4,262 | 0.01 |
| 9 | 449 | 4,344 | 344 | 0.62 |
| 10 | 196 | 834 | 295 | 0.02 |
| 11 | | - | 1,142 | 5.69 |
| 12 | 96,502 | 946 | 17,746 | 0.17 |
| 13 | 9,701 | 314 | 157 | 0.08 |
| 4A | 30 | 201 | 635 | 16.79 |
| 4B | 2,441 | 519 | 2,512 | 0.19 |
| CAR | 30,704 | 1,527 | 1,442 | 4.10 |
| NCR | | - | (386,344)* | (16,797.57 )* |
| **Philippines** | **7,618** | **1,093** | **4,152** | **10.77** |

*Outlier: Ninoy Aquino Parks, Wildlife and Nature Center (NCR)

Roads and trails present are a threat to PAs as they increase PA accessibility making them more vulnerable to incompatible human activities. Table 9 tabulates the average number of roads and trails within PAs and their densities per 1000 hectares by region.

**Table 9.** Roads and trails within PAs, by region

| Region | Average km of road | Average km of roads/1000 ha | Hiking trail (km) | Km of trails/1000 ha |
|---|---|---|---|---|
| 1 | 5.23 | 9.15 | 7.23 | 21.61 |
| 2 | 3.53 | 15.77 | 9.00 | 1.76 |
| 3 | 28.67 | 0.39 | 20.17 | 18.81 |
| 5 | 7.01 | 2.54 | 29.00 | 57.11 |
| 6 | 60.00 | 2.46 | 19.25 | 2.11 |
| 7 | 18.05 | 4.78 | 5.80 | 39.12 |
| 8 | 23.71 | 1.44 | 1.00 | 2.75 |
| 9 | 3.50 | 13.98 | 6.38 | 46.84 |
| 10 | 14.42 | 16.91 | 12.54 | 94.17 |
| 11 | 44.00 | 219.23 | | |
| 12 | 687.04 | 6.74 | 206.11 | 2.02 |
| 13 | 64.00 | 1.28 | 108.50 | 2.22 |
| 4A | 1.75 | 6.26 | 4.90 | 18.34 |
| 4B | 23.51 | 10.71 | 10.19 | 17.50 |
| CAR | 33.20 | 12.99 | 49.00 | 16.89 |
| NCR | 2.00 | 86.96 | 1.90 | 82.61 |
| **Philippines** | **28.46** | **13.18** | **24.04** | **28.50** |

### 4.2.3 Staffing

***Regular staffing of PAs***

In some PAs, a number of regular staff assigned by the DENR, especially the PASu, are not necessarily engaged in a full-time capacity; many have several designations or other duties aside from PA

management of one site. Some PASus are handling more than one PA or two different assignments. Thus, the estimated average number of staff has to reflect the proportional time these regular assigned staff devote to a particular PA, and these are tabulated in Table 10. Two outliers were detected in the average staff per 1000 ha and these PAs were excluded from the computation changing average staff per 1000 ha from 43.42 to 7.46. Figure 1 and Figure 2 show the scatter plot with and without outliers, respectively.

**Table 10.** Average regular staff by region

| Region | Average no. of staff/PA | Average staff/1000 ha | Average staff/1000 visitors | Average no. of inhabitants/1000 ha | Average staff/1000 population |
|---|---|---|---|---|---|
| 1 | 1.76 | 7.43 | 3.11 | 106 | 0.54 |
| 2 | 1.47 | 11.08 | 1.78 | 32 | 0.15 |
| 3 | 3.60 | 0.07 | 24.83 | 14 | 0.33 |
| 5 | 3.42 | 19.66 | 23.16 | 367 | 0.76 |
| 6 | 6.90 | 2.40 | 24.90 | 164 | 0.97 |
| 7 | 2.31 | 4.03 | 0.11 | 4,608 | 0.36 |
| 8 | 10.53 | 1.97 | 7.27 | 174 | 0.07 |
| 9 | 0.59 | 7.28 | 4.90 | 4,344 | 0.09 |
| 10 | 4.44 | [95.73]* 0.58 | 26.91 | 834 | 1.90 |
| 11 | 2.40 | 11.96 | 2.10 | - | 0.04 |
| 12 | 3.00 | 0.03 | 0.17 | 946 | 0.07 |
| 13 | 2.60 | 0.22 | 15.25 | 314 | 0.18 |
| 4A | 1.37 | 29.25 | 5.21 | 201 | 0.16 |
| 4B | 5.96 | 3.73 | 13.06 | 519 | 0.25 |
| CAR | 3.20 | 4.42 | 44.82 | 1,527 | 0.14 |
| NCR | 52.00 | [2,260.87]* | 0.13 | - | 0.26 |
| **Philippines** | **3.85** | **7.46** | **13.84** | **1,093** | **0.50** |

*Outliers excluded are Ninoy Aquino Parks and Nature Center (NCR) and Baliangao PLS (Region 10). Figure in parenthesis indicates the average number of staff (at the regional level) with the outliers included. Figure after the asterisk is the new average without the outlier.

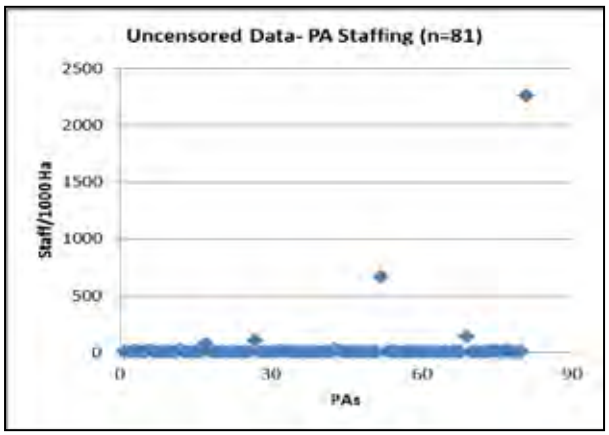


**Figure 1.** PA staff per 1000 ha for 81 PAs with outliers

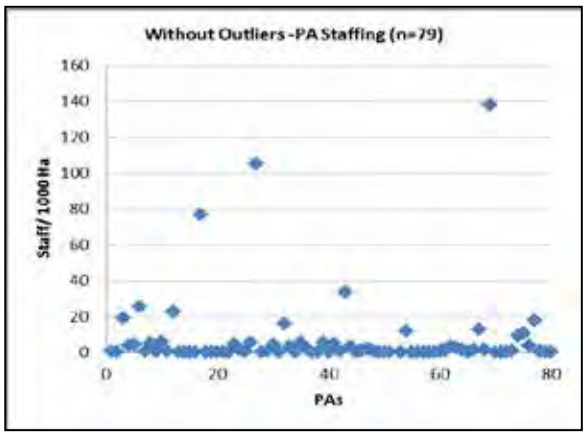


**Figure 2.** PA staff per 1000 ha for 79 PAs with two outliers removed

To determine any relationships between internal and external pressures and the management response indicators like staffing and operating expenses, scatter diagrams (without the outliers) were drawn (Figures 3 and 4). It was found that both the *population outside PAs* and the *number of PA inhabitants* have a

direct and positive relationship with *number of PA staff*. This means that the higher the population inside and outside PAs, the higher the number of PA regular staff.

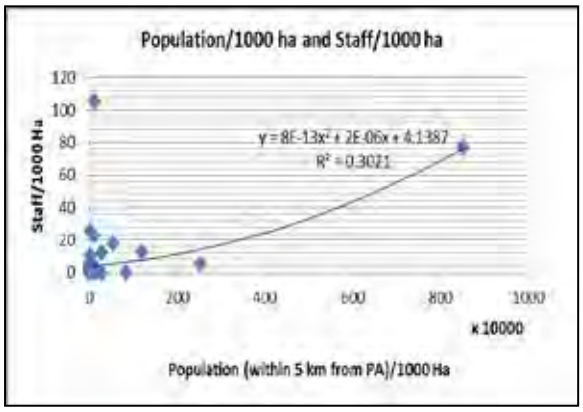


**Figure 3.** Relationship between population outside PA and number of regular PA staff

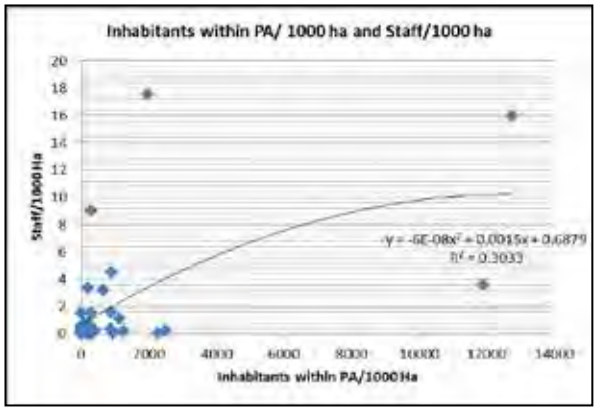


**Figure 4.** Relationship between number of PA inhabitants and number of regular PA staff

Likewise, *number of PA visitors* and *length of PA roads* affect PA regular staffing positively, but only up to a certain degree after which the relationship becomes negative (Figures 5 and 6).

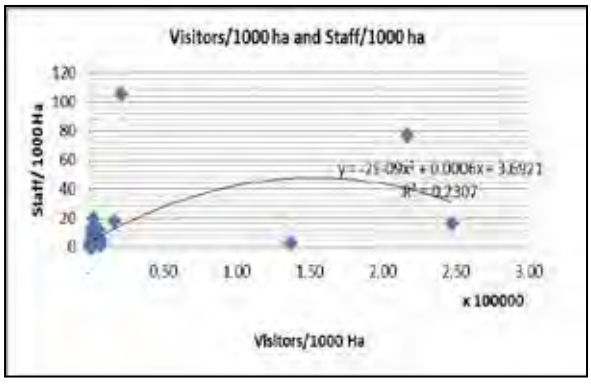


**Figure 5.** Relationship between number of PA visitors and number of regular PA staff

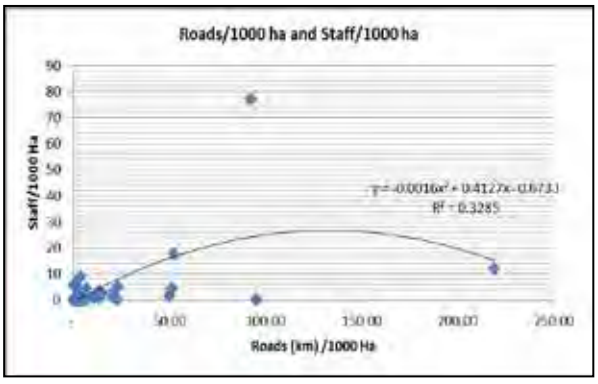


**Figure 6.** Relationship between length of PA roads and number of regular PA staff

***PA enforcement staff***

Enforcement staff are usually a combination of regular and contractual staff who are authorized to apprehend and implement the PA rules and regulations. Table 11 summarizes the average number of enforcement staff by region. The same two outliers were detected in the average enforcement staff per 1000 hectares, and these PAs were excluded.

It was found that the *population outside PAs* and the *number of PA inhabitants* are positively correlated with *number of PA enforcement staff* (Figures 7 and 8). Likewise, the *number of PA visitors* and the *number of PA enforcement staff* is also positively related (Figure 9). On the other hand, like its relationship with *number of PA regular staff*, *length of PA roads* and *number of PA enforcement staff* are positively related but only up to a certain degree (Figure 10).

**Table 11.** Average number of enforcement staff, by region

| Region | Average no. of enforcement staff/PA | Average enforcement staff/1000 ha | Average enforcement staff/1000 visitors | Average enforcement staff/1000 pop |
|---|---|---|---|---|
| 1 | 2.83 | 17.83 | 2.73 | 1.39 |
| 2 | 2.67 | 25.78 | 3.24 | 0.19 |
| 3 | 3.33 | 0.06 | 20.83 | 0.30 |
| 5 | 3.67 | 19.67 | 23.16 | 0.76 |
| 6 | 13.00 | 0.53 | 24.90 | 1.86 |
| 7 | 6.29 | 64.47 | 0.66 | 0.45 |
| 8 | 7.00 | 3.26 | 4.69 | 0.05 |
| 9 | 0.80 | 6.60 | 3.81 | 0.04 |
| 10 | 4.00 | [95.68 ]*0.51 | 27.78 | 1.55 |
| 11 | 3.00 | 14.95 | 2.63 | 0.06 |
| 12 | 3.00 | 0.03 | 0.17 | 0.07 |
| 13 | 4.00 | 0.93 | 19.01 | 0.41 |
| 4A | 4.00 | 29.71 | 62.85 | 0.05 |
| 4B | 5.63 | 8.00 | 32.08 | 0.54 |
| CAR | 3.50 | 5.53 | 56.35 | 0.18 |
| NCR | 33.00 | [1,434.78]* | 0.09 | 0.17 |
| **Philippines** | **4.36** | **16.97** | **20.82** | **0.67** |

*Outliers excluded are also Ninoy Aquino Parks and Nature Center (NCR) and Baliangao PLS (Region 10). Figure in parenthesis indicates the average number of staff (at the regional level) with the outliers included. Figure after the asterisk is the new average without the outlier.

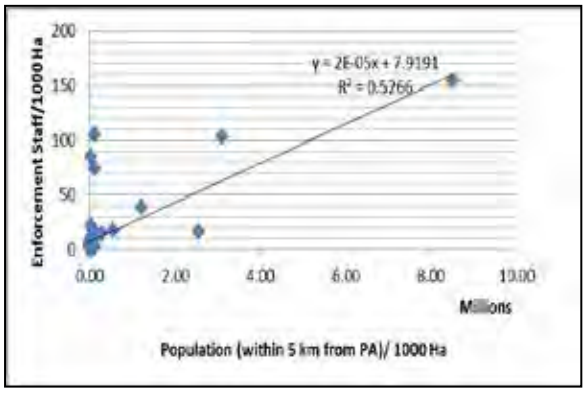


**Figure 7.** Relationship between population outside PA and number of PA enforcement staff

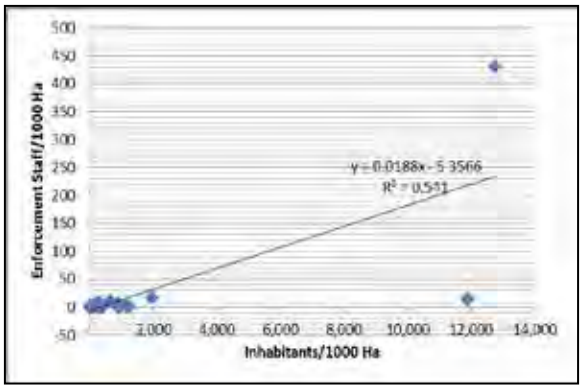


**Figure 8.** Relationship between number of PA inhabitants and number of PA enforcement staff

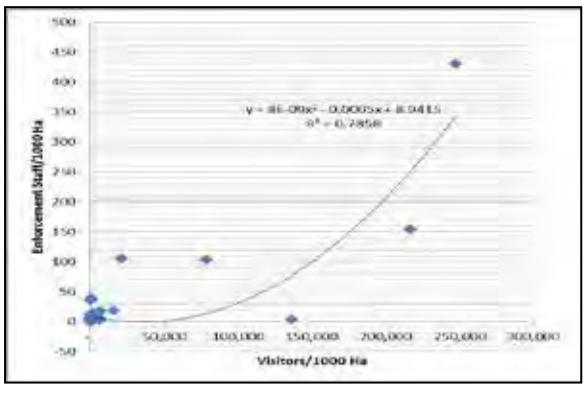


**Figure 9.** Relationship between number of PA visitors and number of PA enforcement staff

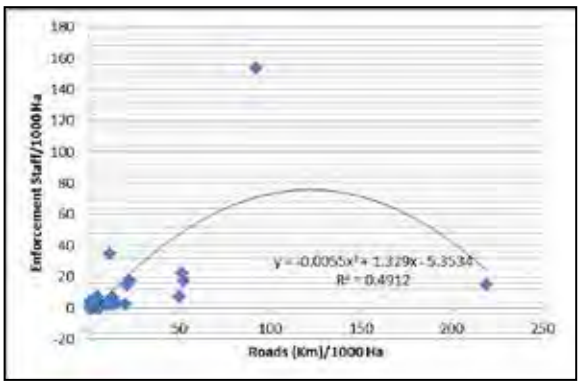


**Figure 10.** Relationship between length of PA roads and number of PA enforcement staff

### 4.2.4 Operating expenses

The 2009 operating expenses include personnel services and other operating expenditures incurred in the direct management of PAs. The national government shouldered most of the PA operating expenses in 2009 (94.5%). The average expenses are shown in Table 12, after exclusion of outliers.

**Table 12.** PA management expenditure by region, 2009

| Region | Average 2009 expenses (PhP) | Average expenses/ha (PhP) | Average expenses/ha (USD) | Average expenses/1000 visitors (PhP) | Average expenses/1000 visitors (USD) |
|---|---|---|---|---|---|
| 1 | 209,456 | 1,175 | 24.76 | 534,286 | 11,941 |
| 2 | 221,542 | 1,309 | 27.60 | 543,830 | 12,154 |
| 3 | 263,150 | 7 | 0.14 | 3,390,896 | 75,784 |
| 5 | 526,108 | 10,075 | 212.35 | 1,843,658 | 41,204 |
| 6 | 1,429,000 | 667 | 14.07 | 5,034,483 | 112,516 |
| 7 | 259,108 | 1,128 | 23.78 | 12,123 | 271 |
| 8 | 2,347,027 | 373 | 7.86 | 1,625,528 | 36,329 |
| 9 | 207,533 | 1,883 | 39.69 | 2,134,957 | 47,714 |
| 10 | 984,478 | [43,909]*116.54 | [925.49]*2.46 | 7,240,459 | 161,818 |
| 11 | 313,200 | 1,561 | 32.89 | 274,256 | 6,129 |
| 12 | 8,590,800 | 84 | 1.78 | 484,098 | 10,819 |
| 13 | 834,455 | 61 | 1.30 | 5,344,216 | 119,439 |
| 4A | 442,147 | 12,152 | 256.12 | 1,014,943 | 22,683 |
| 4B | 719,687 | 531 | 11.18 | 2,556,409 | 57,134 |
| CAR | 435,030 | 153 | 3.23 | 2,080,737 | 46,503 |
| NCR | 18,889,000 | [821,261]* | [17,309.87]* | 48,892 | 1,093 |
| **Philippines** | **875,103** | **2,213** | **46.65** | **2,227,377** | **49,780** |

Notes: 1) *Outliers excluded are Ninoy Aquino Parks and Nature Center (NCR) and Baliangao PLS (Region 10). Figure in parenthesis indicates the average expenses (at the regional level) with the outliers included. Figure after the asterisk is the new average without the outlier.
2) USD 1.0 = PhP 47.44 (2009)

It was found that *number of PA visitors*, *length of PA roads*, *population outside PA*, and *number of PA inhabitants* are positively correlated with *operating expenses*. The relationship of *length of PA roads* and *population outside PA* with *operating expenses* (Figures 12 and 13) is weaker compared to that of *number of PA visitors and inhabitants* with *operating expenses* (Figures 11and 14). In other words, PA management tends to incur more expenses as inhabitants and visitors increase than if the outside population increase or road networks expand.

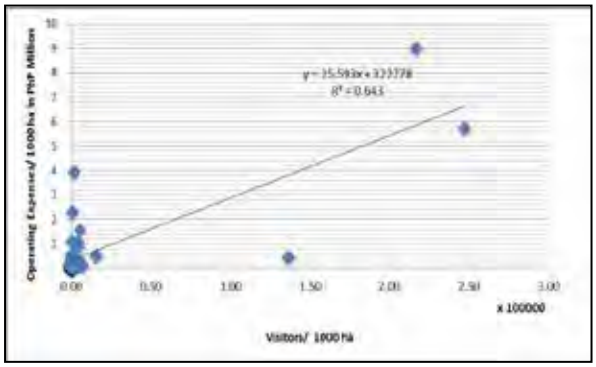


**Figure 11**. Relationship between number of PA visitors and PA 2009 operating expenses

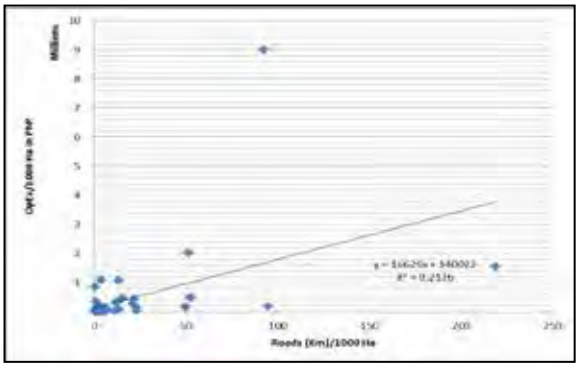

**Figure 12.** Relationship between length of PA roads and PA 2009 operating expenses

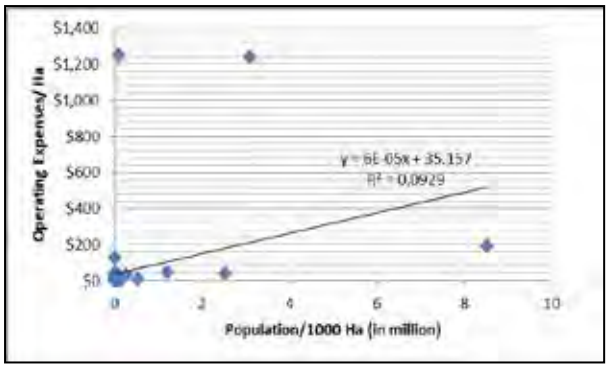


**Figure 13.** Relationship between population outside PAs and 2009 PA operating expenses

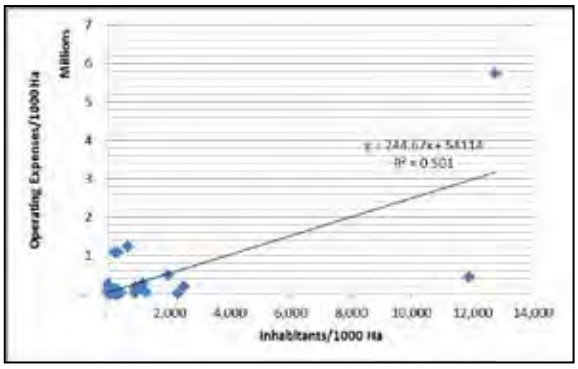


**Figure 14.** Relationship between number of PA inhabitants and 2009 PA operating expenses

## 4.3 Benchmarking and Resource Gap Analysis by Clustering

Due to large disparity in the average staff and expenses between areas of small and large PAs, PAs were grouped into four clusters according to size: small, medium, large, and very large (Table 13). The clustering of PAs was observed in fine-tuning benchmarks, and in gap analysis of PAs, more particularly in terms of staff per 1,000 ha and operating expenses per hectare. Outliers observed in previous benchmarks at the regional and country levels were excluded.

The rule that was observed in this resource gap analysis was to bring the value to cluster average, if the original value is lower than average; or to bring the value to the highest cluster value, if the original value is above average. The difference between the original value and the enhanced value is the resource gap.

**Table 13.** Clustering of PAs according to size

| Cluster no. | Descriptive cluster title | Cluster range (ha) | Count of PAs in cluster | Cumulative no. of PAs | Average area (ha) | Total area (ha) |
|---|---|---|---|---|---|---|
| **1** | Small | 1 to1,000 | 35 | 35 | 237 | 8,281 |
| **2** | Medium | > 1,000 to 15,000 | 26 | 61 | 4,555 | 118,438 |
| **3** | Large | > 15,000 to 70,000 | 12 | 73 | 34,187 | 410,240 |
| **4** | Very Large | > 70,000 to 333,300 | 6 | 79 | 162,100 | 972,599 |
| | Overall | 1 to 333,3000 | 79 | | 19,108 | 1,509,557 |

### 4.3.1 Staff per 1000 ha

Using the rule to determine the staff gap of PAs per cluster as described in the section above, pertinent parameters and results of the computation are summarized in Table 14. For the 79 surveyed PAs, no less than 412 staff are needed to bring its staff to cluster average or to attain the highest cluster number of staff. The benchmark staff is estimated at 670 staff for the 79 PAs. Computations of the staff gap for each PA are shown in Appendix A.

At the national level, an extrapolation of the staff gap per 1000 hectare will indicate a shortfall of 1,478 staff for the entire 238 PAs of the country.

**Table 14.** Staff gap per cluster

| Cluster no. | Descriptive cluster title | Total area (1000 ha) | Sum of staff currently filled | Sum of staff/1000 ha | Average staff/1000 ha | Highest no. of staff/1000 ha | Sum of staff gap/ 1000 ha | Total staff gap |
|---|---|---|---|---|---|---|---|---|
| **1** | Small | 8 | 35 | 551 | 15.76 | 137.93 | 1,100 | 155 |
| **2** | Medium | 118 | 100 | 36 | 1.37 | 9.04 | 54 | 191 |
| **3** | Large | 410 | 65 | 2 | 0.18 | 0.53 | 1 | 48 |
| **4** | Very Large | 973 | 58 | 0 | 0.06 | 0.10 | 0 | 18 |
| | Overall | **1,510** | **259** | **590** | | | **1,155** | **412** |
| | | | | | | **Existing Staff** | | **259** |
| | | | | | | **Benchmark Staff** | | **670** |

### 4.3.2 Operational expense per hectare

The total expense gap for the 79 benchmarked PAs is estimated at USD2.35 million. The breakdown per cluster is summarized in Table 15 and the expense gap computation per PA is shown in Appendix B.

When the operating expense gap per hectare is extrapolated at the national level, we calculated a shortfall of USD 8.4 million for the 238 PAs of the Philippines.

**Table 15.** Operational expense gap per cluster

| Cluster no. | Descriptive cluster title | 2009 expenses/ ha (Php) | USD-adjusted 2009 expenses | USD-adjusted 2009 expenses/ ha | Average USD-adjusted 2009 expenses/ ha | Highest USD-adjusted expenses/ ha | Sum of expense gap/ha (USD) | Total expense gap (USD) |
|---|---|---|---|---|---|---|---|---|
| **1** | Small | 170,239 | 165,381 | 3,588.17 | 102.52 | 1,249.66 | 6,883 | 896,562 |
| **2** | Medium | 4,011 | 259,511 | 84.54 | 3.25 | 22.87 | 177 | 570,828 |
| **3** | Large | 493 | 292,148 | 10.39 | 0.87 | 2.78 | 8 | 246,784 |
| **4** | Very Large | 120 | 369,158 | 2.54 | 0.42 | 1.78 | 3 | 631,005 |
| | Overall | 174,864 | 1,086,198 | 3,685.64 | | | 7,070 | **2,345,179** |
| | | | | | | **Existing Operating Expense (USD)** | | **1,086,198** |
| | | | | | | **Benchmark Operating Expense (USD)** | | **3,431,377** |

Note: USD 1.0 = PhP 47.44 (2009)

## 4.4 Financing Protected Areas

### 4.4.1 Existing fee structure

In the absence of approved PAMB resolutions on fees and charges prescribed for particular PAs, the existing fee structure and fee levels that can be imposed are to be based on DAO 95-5[4], which generally sets the entrance fee of PhP2.50 (USD0.05) for each visitor of PAs. Children below 5 years old, senior citizens, and handicapped persons are exempted from paying entrance fees.

[4] DENR Administrative Order 5, Series of 1995, "Regulating and Prescribing Fees for Use of Facilities Inside National Parks and Other Protected Areas"

If this amount has not been amended by a PAMB resolution since it was set in 1995, it is considered very low based on current prices. In fact, the fee collected would not even be sufficient to recover the expenses for fee collection itself. Guidelines for determining fees for access to and sustainable use of resources in PAs were set in 2000 under DAO 2000-51[5]. Unfortunately, many PAs have not pursued this approach until PAMB resolutions are approved.

DAO 95-5 also determines the entrance fee for particular PAs such as Ninoy Aquino Parks and Wildlife Nature Center (PhP5.00 for adults and PhP3.00 for students); and Calauit Game Reserve and Wildlife Sanctuary, El Nido Marine Reserve, St. Paul Subterranean River National Park, and Mt. Pulag National Park (PhP300.00 for each national visitor, USD10.00 for each foreigner, and PhP50.00 for each local visitor).

Based on survey results, some PAs have a different set of entrance fees which are presumably based on approved PAMB resolutions (Table 16).

**Table 16.** Entrance fee structure of other PAs based on the survey

| Protected area | Entrance fee (PhP) per visitor category | | | |
|---|---|---|---|---|
| | Adult | Child/student | Senior citizens | Type of visitor |
| Allah Watershed Forest Reserve | 20 | 10 | 16 | Any |
| Caramoan National Park | 300 | 300 | 300 | Any |
| Apo Island Protected Landscape and Seascape | 100 | 100 | 100 | International & National |
| | 25 | 10 | 5 | Local |
| Olango Island Wildlife Sanctuary | 100 | 50 | 50 | International |
| | 20 | 10 | 10 | National & Local |
| Great and Little Sta. Cruz Islands Protected Landscape & Seascape | 30 | 30 | 30 | Any |

### 4.4.2 Internal sources of revenues

About 48% (39 out of 81) of the surveyed PAs did not earn any fees and concessions, while two regions did not register any earnings from fees. The total annual fees collected ranges from PhP780.00 to PhP10,750,000.00 and the average annual earnings from fees and concessions is posted at PhP316,499.00 (USD6,670.63). The total fee collection that can be used in the park is fixed by law at 75% of the revenue. This is deposited to the IPAF[6] sub-fund, which is earmarked for use of the PA that generates the revenue. The remaining 25% is contributed to a central IPAF, which may be used by other PAs within the NIPAS, subject to the qualifications and requirements under the revised NIPAS regulations[7]. Fees and charges account for only 11% of the total fund/revenue sources (Figure 15).

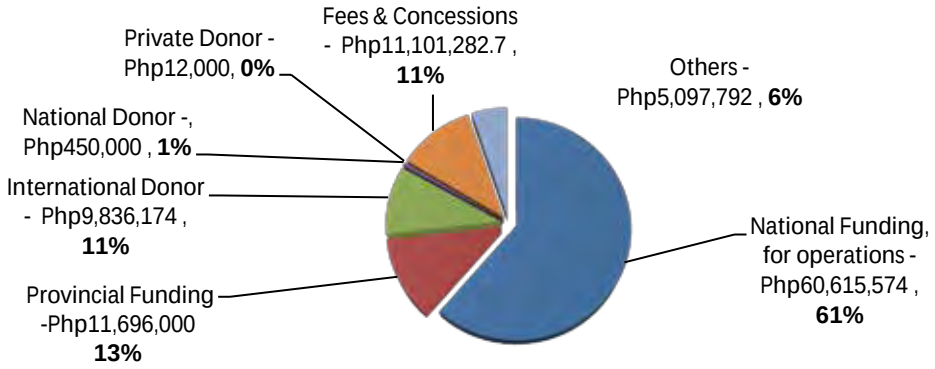


**Figure 15.** PA fund sources

[5] DENR Administrative Order 2000-51. 2000. "Guidelines and Principles for Determining Fees for Access to and Sustainable Use of Resources in Protected Areas"

[6] The Integrated Protected Area Fund is a trust fund created under the NIPAS law.

[7] See DENR Administrative Order No. 2008-26 "Revised Implementing Regulations of Republic Acts No. 7586 or the National Protected Areas System (NIPAS) Act of 1992"

The primary source of other revenue of PAs is the national budget allocated by the national government (61%), while provincial governments and international donors contribute 13% and 11%, respectively (Figure 15). Table 17 summarizes the regional revenue generated by PAs in 2009.

**Table 17.** Internal revenue generated by surveyed PAs per region, 2009

| Region | Total fees and concessions collected (PhP) [A] | Total fees used in the park (PhP) [B] | Total of other sources of revenue (PhP) [C] | Total revenue from PA in 2009 (PhP) [D=A+C] | USD-adjusted total revenue from PA |
|---|---|---|---|---|---|
| 1 | 1,088,952 | 799,454 | 2,429,477 | 3,518,429 | 74,159 |
| 2 | 161,260 | 117,000 | 1,628,291 | 1,789,551 | 37,719 |
| 3 | 207,055 | 155,291 | 835,001 | 1,042,056 | 21,964 |
| 5 | 78,677 | 7,355 | 2,083,450 | 2,162,127 | 45,572 |
| 6 | 30,400 | - | 2,858,000 | 2,888,400 | 60,879 |
| 7 | 5,955,160 | 4,537,540 | 1,984,757 | 7,939,917 | 167,351 |
| 8 | - | - | 5,613,081 | 5,613,081 | 118,308 |
| 9 | 2,875 | 1,406 | 945,200 | 948,075 | 19,983 |
| 10 | 216,582 | 12,000 | 16,012,764 | 16,229,345 | 342,069 |
| 11 | 7,700 | - | 313,200 | 320,900 | 6,764 |
| 12 | - | - | 8,590,800 | 8,590,800 | 181,070 |
| 13 | 32,130 | 25,420 | 2,779,415 | 2,811,545 | 59,260 |
| 4A | 1,425,100 | 1,041,825 | 3,687,733 | 5,112,833 | 107,764 |
| 4B | 1,102,530 | 779,040 | 11,576,870 | 12,679,400 | 267,246 |
| CAR | 11,515,742 | 765,742 | 2,175,149 | 13,690,891 | 288,566 |
| NCR | 3,812,279 | 2,859,209 | 24,194,352 | 28,006,631 | 590,302 |
| **Philippines** | **25,636,441** | **11,101,283** | **87,707,539** | **113,343,981** | **2,388,975** |

Note: USD 1.0 = PhP 47.44 (2009)

### 4.4.3 Key issues

Among the key issues related to the resource gap are:

a) ***Depleted DENR staff.*** The current staffing strategy of PAs is mostly based on temporary assignment of existing regular staff from the DENR field office to a specific PA. However, the field offices of the DENR like Community Environment and Natural Resources Offices (CENRO) and Provincial Environment and Natural Resources Office (PENRO) are already depleted of qualified staff due to the current policy of the government that forbids new hiring and promotion[8]. As a result, the remaining low-grade staff (i.e., forest rangers, scalers, tree markers, and laborers) are compelled to take on additional duties in some PAs, although these responsibilities are over and above their pay grade. As many have several concurrent assignments and designations, insufficient time is actually devoted to the specific PAs. Moreover, many of the temporarily assigned staff and officers of the DENR do not have the proper education and training for effective PA management.

b) ***Current policy constriction on PA staff appointment.*** The NIPAS law and its implementing rules and regulation is long on PAMB composition but short on PASu and PA staff organization, which is critical in the execution of plans and programs of the PA. The current strategy to appoint PENR Officers or CENR Officers or officials of DENR in concurrent capacity as PASu may not properly address the staff gap as the designated staff is too thinly spread to be effective. To compound this problem, DENR is currently not

[8] Executive Order No. 366 (EO 366)

allowed to hire new staff due to EO 366. The NIPAS law offers no opportunity for any kind of staff appointment.

c) ***Insufficient fees and internal revenues.*** Fees and other charges collected by PAs account for less than a fourth of the total revenue. The low revenue collection is due to a variety of factors. The current general entrance fee of PhP2.50 (USD0.05) per visitor is too low at today's price, and collecting this undervalued fee only operates as an additional cost or burden to the meager staff of the PA. In fact, the PA's financial condition would be better off not collecting this fee at all, because the cost of collection is greater than the revenue collected, resulting only in negative net revenue. In the long run, underpricing of resources like this contributes to the deterioration of the whole NIPA system. Most PAs are also not positioned to generate revenue.

Non-earning and low-earning PAs do not have an adequate and transparent revenue collection system, as well as other management systems such as sufficient qualified people and resources to collect and use revenue. In addition, non-earning PAs and earning PAs who have not experienced using their collected fees are not motivated to generate revenue due to the perceived tedious requirement of IPAF system and long approval process needed to use the collections for the operation of their PA (also in Anda, 2006).

Some PAs do not receive budgetary allocation for their operating expenses. As a result, they do not perform as a PA in accordance with the NIPAS law.

# 5.0 CONCLUSION AND RECOMMENDATIONS

## 5.1 Conclusion

There is no doubt that the resources, both in terms of staff and budget, currently used by PAs in general are insufficient to meet their conservation objectives and administrative requirements. This study has determined that based on the clustering of 79 PAs by size, a sum of 412 staff and USD 2.35 million is needed in order to bring below-average PAs to cluster average, and above-average PAs to the highest cluster level.

At the national level and using national benchmarks, it is estimated that we have a shortfall of 1,478 staff and USD8.4 million in operating expense for all 238 Philippine PAs. These are low estimates considering the relatively low average of Philippine PAs in terms of staffing and operating expenses compared to many of its Asian neighbors. However, these estimates, which were attained by clustering PAs by size, are a good starting point for realistic and pragmatic improvements in upgrading the PAs in terms of national averages. The next stage could be to level up Philippine PAs using Southeast Asian and international benchmarks.

## 5.2 Policy Recommendations

To address resource gap under current predicament and improve the operation and financing sustainability of PAs, the DENR may opt to pursue any or all of the following recommendations:

a) Pursue the enactment of PA mandate or enabling law pursuant to NIPAS Act to include, among others, the organization and staffing pattern that will be used for the PA. This is critical so that a PA can hire its personnel, direct the Department of Budget and Management to allot budgetary resources, and skip the restrictions imposed by EO 366. PAs that lack this provision in their charter or enabling law cannot cure it in the subsequent implementing rules and regulations, which is just a product of the enabling law.

b) Finish the assessment of the remaining initial components of NIPAS once and for all, and appropriate sufficient budget to accomplish this within a specified timeframe, say 2012, to coincide with the 20th anniversary of the NIPAS law. Prolonging this assessment will only add confusion to the management of the PA sites, which can make these conservation lands vulnerable to exploitation and squatting.

c) Contract out management or co-manage the PA with interested LGUs. As public corporations, LGUs can raise capital and hire qualified people. NGOs and academic institutions can also qualify. It is, however, essential that DENR consistently maintains strong monitoring and active supervision of the PA 'manager' or 'co-manager' to ensure that the plans and programs are prepared, approved, and implemented, and that IPAF revenues are collected. Performance bonds and penalties may encourage good compliance.

d) Pursue a continuing capacity-building program for PASu, PA staff, and PAMB members. This will augment the skills and knowledge of low-grade staff to take on more responsibilities, as well as improve PAMB members' policy decision.

e) Establish a transparent and adequate collection system as well as other management systems per PA (also in Anda, 2006). Without a functional revenue collection system, no fee collection can be expected and PA resources are exploited and being used for free to the point of degradation and ruin.

f) Upgrade the general entrance fee and other charges set in 1995 using the cost recovery and 'willingness-to-pay' principles, as stated in DAO 2000-51. Many PAMBs and PASus do not have the capacity and competence to determine the PA fee and charges, and waiting for them to undertake this may no longer be wise as foregone revenues are piling up.

g) Allocate budget to individual PAs, instead of lump sum appropriation to the regional office. This will prevent the shuffling of funds resulting in diminished funds and reduced usage by individual PAs. It could also be a defining document for each PA to become either a paper park or a true park.

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**Appendix A.** Computation of staff gap

| Cluster no. | Name of protected area | Total area (ha) | Total area (thousand ha) | No. of full-time staff currently filled | Number of full time staff/1000 ha | Average no. of full time staff/1000 ha in cluster | Highest no. of full time staff/1000 ha in cluster | Full-time staff gap/1000 ha | Full-time staff gap (gap/1000 ha x total area in 1000 ha) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Agoo-Damortis Protected Landscape and Seascape (ADPLS) | 210 | 0.21 | 4.00 | 19.05 | 15.76 | 137.93 | 118.88 | 24.97 |
| 1 | Alabat Watershed Forest Reserve | 688 | 0.69 | 1.00 | 1.45 | 15.76 | 137.93 | 14.30 | 9.84 |
| 1 | Alburquerque-Loay-Loboc Protected Landscape/Seascape | 93 | 0.09 | 0.30 | 3.22 | 15.76 | 137.93 | 12.53 | 1.17 |
| 1 | Aliguay Island Protected Landscape/Seascape | 62 | 0.06 | 0.30 | 4.84 | 15.76 | 137.93 | 10.92 | 0.68 |
| 1 | Apo Island Protected Landscape and Seascape | 63 | 0.06 | 1.00 | 15.96 | 15.76 | 137.93 | 121.97 | 7.64 |
| 1 | Apo Reef Natural Park | 29 | 0.03 | 4.00 | 137.93 | 15.76 | 137.93 | - | - |
| 1 | Bacolod-Kauswagan Protected Landscape and Seascape | 200 | 0.20 | 0.05 | 0.25 | 15.76 | 137.93 | 15.51 | 3.10 |
| 1 | Bangan Hill National Park | 13 | 0.01 | 1.00 | 76.92 | 15.76 | 137.93 | 61.01 | 0.79 |
| 1 | Bigbiga Protected Landscape | 136 | 0.14 | 0.60 | 4.41 | 15.76 | 137.93 | 11.34 | 1.54 |
| 1 | Buenavista Protected Landscape | 284 | 0.28 | 0.33 | 1.17 | 15.76 | 137.93 | 14.58 | 4.14 |
| 1 | Calauag Watershed Forest Reserve | 328 | 0.33 | 0.05 | 0.15 | 15.76 | 137.93 | 15.60 | 5.12 |
| 1 | Caramoan National Park | 347 | 0.35 | 2.00 | 5.76 | 15.76 | 137.93 | 9.99 | 3.47 |
| 1 | Cassamata Hill National Park | 57 | 0.06 | 1.00 | 17.54 | 15.76 | 137.93 | 120.39 | 6.86 |
| 1 | Cuatro Islas Protected Landscape/Seascape | 103 | 0.10 | 0.60 | 5.83 | 15.76 | 137.93 | 9.93 | 1.02 |
| 1 | Island of Alibijaban | 430 | 0.43 | 1.00 | 2.33 | 15.76 | 137.93 | 13.43 | 5.77 |
| 1 | Jose Rizal Memorial Protected Landscape | 439 | 0.44 | 0.50 | 1.14 | 15.76 | 137.93 | 14.62 | 6.42 |
| 1 | Kuapnit Balinsasayao Natural Park | 364 | 0.36 | 0.00 | 0.00 | 15.76 | 137.93 | 15.76 | 5.73 |

*Appendix A continued*

| Cluster no. | Name of protected area | Total area (ha) | Total area (thousand ha) | No. of full-time staff currently filled | Number of full time staff/1000 ha | Average no. of full time staff/1000 ha in cluster | Highest no. of full time staff/1000 ha in cluster | Full-time staff gap/1000 ha | Full-time staff gap (gap/1000 ha x total area in 1000 ha) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Lagonoy Natural Biotic Area | 445 | 0.45 | 2.00 | 4.49 | 15.76 | 137.93 | 11.26 | 5.01 |
| 1 | Lake Malimanga Bird and Fish Sanctuary | 9 | 0.01 | 0.00 | 0.01 | 15.76 | 137.93 | 15.74 | 0.14 |
| 1 | Libmanan Caves | 19 | 0.02 | 2.00 | 105.26 | 15.76 | 137.93 | 32.67 | 0.62 |
| 1 | Libunao Protected Landscape | 47 | 0.05 | 1.20 | 25.53 | 15.76 | 137.93 | 112.40 | 5.28 |
| 1 | Lopez Watershed Forest Reserve | 418 | 0.42 | 0.65 | 1.56 | 15.76 | 137.93 | 14.20 | 5.94 |
| 1 | Maulawin Spring Protected Landscape | 149 | 0.15 | 0.50 | 3.36 | 15.76 | 137.93 | 12.40 | 1.85 |
| 1 | Mulanay Watershed Forest Reserve | 26 | 0.03 | 0.33 | 12.82 | 15.76 | 137.93 | 2.93 | 0.08 |
| 1 | Murcielagos Island Protected Landscape and Seascape | 15 | 0.02 | 0.50 | 33.33 | 15.76 | 137.93 | 104.60 | 1.57 |
| 1 | Paoay Lake National Park | 340 | 0.34 | 2.00 | 5.88 | 15.76 | 137.93 | 9.87 | 3.36 |
| 1 | Pujada Bay Protected Landscape/Seascape | 201 | 0.20 | 2.40 | 11.96 | 15.76 | 137.93 | 3.80 | 0.76 |
| 1 | Rasa Island Wildlife Sanctuary | 943 | 0.94 | 1.00 | 1.06 | 15.76 | 137.93 | 14.69 | 13.86 |
| 1 | Selinog Island Protected Landscape and Seascape | 70 | 0.07 | 0.25 | 3.57 | 15.76 | 137.93 | 12.18 | 0.85 |
| 1 | Sta. Lucia Protected Landscape | 174 | 0.17 | 0.90 | 5.17 | 15.76 | 137.93 | 10.58 | 1.84 |
| 1 | Surigao Watershed Resource Reserve | 967 | 0.97 | 0.60 | 0.62 | 15.76 | 137.93 | 15.13 | 14.64 |
| 1 | Taklong Island National Marine Reserve | 187 | 0.19 | 0.80 | 4.27 | 15.76 | 137.93 | 11.49 | 2.15 |
| 1 | Tanap Watershed Forest Reserve | 40 | 0.04 | 0.90 | 22.50 | 15.76 | 137.93 | 115.43 | 4.62 |
| 1 | Tibiang-Damagandong Watershed | 280 | 0.28 | 0.45 | 1.61 | 15.76 | 137.93 | 14.15 | 3.96 |
| 1 | Torrijos Watershed Forest Reserve | 105 | 0.11 | 1.10 | 10.48 | 15.76 | 137.93 | 5.28 | 0.55 |

*Appendix A continued*

| Cluster no. | Name of protected area | Total area (ha) | Total area (thousand ha) | No. of full-time staff currently filled | Number of full time staff/1000 ha | Average no. of full time staff/1000 ha in cluster | Highest no. of full time staff/1000 ha in cluster | Full-time staff gap/1000 ha | Full-time staff gap (gap/1000 ha x total area in 1000 ha) |
|---|---|---|---|---|---|---|---|---|---|
| 35 | Subtotal Cluster 1 | 8,281 | 8.28 | 35.32 | 551.44 | 551.44 | 4,827.59 | 1,099.58 | 155.34 |
| 2 | Alijawan-Cansuhay-Anibongan River WFR | 3,630 | 3.63 | 1.00 | 0.28 | 1.37 | 9.04 | 1.10 | 3.98 |
| 2 | Balbalasang Balbalan National Park | 1,338 | 1.34 | 5.00 | 3.74 | 1.37 | 9.04 | 5.31 | 7.10 |
| 2 | Baua Watershed Forest Reserve | 8,955 | 8.96 | 1.00 | 0.11 | 1.37 | 9.04 | 1.26 | 11.29 |
| 2 | Bessang Pass Natural Monument/Landmark | 1,121 | 1.12 | 0.90 | 0.80 | 1.37 | 9.04 | 0.57 | 0.64 |
| 2 | Bicol Natural Park | 5,201 | 5.20 | 8.00 | 1.54 | 1.37 | 9.04 | 7.50 | 39.03 |
| 2 | Cabilao-Sandigan Island Mangrove Swamp Forest Reserve | 1,243 | 1.24 | 3.14 | 2.53 | 1.37 | 9.04 | 6.51 | 8.09 |
| 2 | Calauit Safari Park | 3,760 | 3.76 | 34.00 | 9.04 | 1.37 | 9.04 | - | - |
| 2 | Chocolate Hills Natural Monument | 14,145 | 14.15 | 1.40 | 0.10 | 1.37 | 9.04 | 1.27 | 18.02 |
| 2 | Great and Little Sta. Cruz Islands Protected Landscape & Seascape | 3,425 | 3.43 | 1.00 | 0.29 | 1.37 | 9.04 | 1.08 | 3.70 |
| 2 | Ilocos Norte Metro WFR | 2,065 | 2.07 | 0.90 | 0.44 | 1.37 | 9.04 | 0.94 | 1.94 |
| 2 | Kalbario-Patapat Natural Park | 3,800 | 3.80 | 0.90 | 0.24 | 1.37 | 9.04 | 1.14 | 4.32 |
| 2 | Lidlidda Protected Landscape | 1,157 | 1.16 | 0.90 | 0.78 | 1.37 | 9.04 | 0.60 | 0.69 |
| 2 | Magapit Protected Landscape | 3,404 | 3.40 | 0.20 | 0.06 | 1.37 | 9.04 | 1.31 | 4.47 |
| 2 | Manleluag Spring Protected Landscape | 1,935 | 1.94 | 7.00 | 3.62 | 1.37 | 9.04 | 5.42 | 10.50 |
| 2 | Marcos Hi-way Watershed Forest Reserve | 6,105 | 6.11 | 1.00 | 0.16 | 1.37 | 9.04 | 1.21 | 7.38 |
| 2 | Marinduque Wildlife Sanctuary | 8,828 | 8.83 | 2.00 | 0.23 | 1.37 | 9.04 | 1.15 | 10.12 |

*Appendix A continued*

| Cluster no. | Name of protected area | Total area (ha) | Total area (thousand ha) | No. of full-time staff currently filled | Number of full time staff/1000 ha | Average no. of full time staff/1000 ha in cluster | Highest no. of full time staff/1000 ha in cluster | Full-time staff gap/1000 ha | Full-time staff gap (gap/1000 ha x total area in 1000 ha) |
|---|---|---|---|---|---|---|---|---|---|
| 2 | Mayon Volcano Natural Park | 5,776 | 5.78 | 5.00 | 0.87 | 1.37 | 9.04 | 0.51 | 2.93 |
| 2 | Mt. Inayawan Range Natural Park | 3,986 | 3.99 | 3.00 | 0.75 | 1.37 | 9.04 | 0.62 | 2.47 |
| 2 | Mt. Pulag National Park | 11,550 | 11.55 | 7.00 | 0.61 | 1.37 | 9.04 | 0.77 | 8.86 |
| 2 | Mt. Timolan Protected Landscape | 1,995 | 2.00 | 1.00 | 0.50 | 1.37 | 9.04 | 0.87 | 1.74 |
| 2 | Nothern Luzon Heroes Hill National Park | 1,316 | 1.32 | 0.90 | 0.68 | 1.37 | 9.04 | 0.69 | 0.91 |
| 2 | Olango Island Wildlife Sanctuary | 1,030 | 1.03 | 6.00 | 5.83 | 1.37 | 9.04 | 3.22 | 3.31 |
| 2 | Palaui Island Protected Landscape & Seascape | 3,000 | 3.00 | 1.00 | 0.33 | 1.37 | 9.04 | 1.04 | 3.12 |
| 2 | Rajah Sikatuna Protected Landscape | 10,453 | 10.45 | 3.30 | 0.32 | 1.37 | 9.04 | 1.06 | 11.05 |
| 2 | Timpoong and Hibok-hibok Natural Monument | 2,228 | 2.23 | 4.00 | 1.80 | 1.37 | 9.04 | 7.25 | 16.15 |
| 2 | Wangag Watershed Forest Reserve | 6,992 | 6.99 | 0.50 | 0.07 | 1.37 | 9.04 | 1.30 | 9.10 |
| | Cluster 2 total | 118,438 | 118.44 | 100.04 | 35.70 | 35.70 | 235.11 | 53.69 | 190.91 |
| 3 | Agusan Marsh Wildlife Sanctuary | 19,197 | 19.20 | 7.00 | 0.36 | 0.18 | 0.53 | 0.17 | 3.23 |
| 3 | Alamio, Buyaan, Carac-an, Panikian Rivers and Sipangpang Falls Watershed Forest Reserve | 43,601 | 43.60 | 4.50 | 0.10 | 0.18 | 0.53 | 0.08 | 3.33 |
| 3 | Cabadbaran Watershed | 16,025 | 16.03 | 0.10 | 0.01 | 0.18 | 0.53 | 0.17 | 2.78 |
| 3 | Catanduanes Watershed Forest Reserve | 26,010 | 26.01 | 1.50 | 0.06 | 0.18 | 0.53 | 0.12 | 3.17 |
| 3 | El Nido Managed Resource Protected Area | 36,018 | 36.02 | 8.50 | 0.24 | 0.18 | 0.53 | 0.30 | 10.70 |
| 3 | Lower Agno Watershed Forest Reserve | 39,304 | 39.30 | 2.00 | 0.05 | 0.18 | 0.53 | 0.13 | 5.06 |

*Appendix A continued*

| Cluster no. | Name of protected area | Total area (ha) | Total area (thousand ha) | No. of full-time staff currently filled | Number of full time staff/1000 ha | Average no. of full time staff/1000 ha in cluster | Highest no. of full time staff/1000 ha in cluster | Full-time staff gap/1000 ha | Full-time staff gap (gap/1000 ha x total area in 1000 ha) |
|---|---|---|---|---|---|---|---|---|---|
| 3 | Mt. Kalatungan Range Natural Park | 21,248 | 21.25 | 2.00 | 0.09 | 0.18 | 0.53 | 0.09 | 1.81 |
| 3 | Mt. Kanlaon Natural Park | 24,388 | 24.39 | 13.00 | 0.53 | 0.18 | 0.53 | - | - |
| 3 | Mt. Kitanglad Natural Park | 31,235 | 31.24 | 13.00 | 0.42 | 0.18 | 0.53 | 0.12 | 3.65 |
| 3 | Mt. Malindang Range Natural Park | 53,262 | 53.26 | 8.00 | 0.15 | 0.18 | 0.53 | 0.03 | 1.56 |
| 3 | Siargao Island Protected Landscape and Seascape (SIPLS) | 62,796 | 62.80 | 0.80 | 0.01 | 0.18 | 0.53 | 0.17 | 10.47 |
| 3 | Talavera Watershed Reservation | 37,156 | 37.16 | 4.80 | 0.13 | 0.18 | 0.53 | 0.05 | 1.87 |
| 3 | Cluster 3 Total | 410,240 | 410.24 | 65.20 | 2.15 | 2.15 | 6.40 | 1.41 | 47.63 |
| 4 | Allah Valley Watershed Forest Reserve | 101,982 | 101.98 | 3.00 | 0.03 | 0.06 | 0.10 | 0.03 | 2.75 |
| 4 | Batanes Protected Landscape & Seascape | 213,578 | 213.58 | 1.60 | 0.01 | 0.06 | 0.10 | 0.05 | 10.45 |
| 4 | Mt. Mantalingahan Protected Landscape | 120,457 | 120.46 | 11.50 | 0.10 | 0.06 | 0.10 | - | - |
| 4 | Pantabangan-Carranglan Watershed Reservation | 84,500 | 84.50 | 6.00 | 0.07 | 0.06 | 0.10 | 0.02 | 2.07 |
| 4 | Peñablanca Protected Landscape/Seascape | 118,782 | 118.78 | 5.00 | 0.04 | 0.06 | 0.10 | 0.01 | 1.70 |
| 4 | Samar Island Natural Park | 333,300 | 333.30 | 31.00 | 0.09 | 0.06 | 0.10 | 0.0025 | 0.82 |
| 4 | Cluster 4 Total | 972,599 | 972.60 | 58.10 | 0.34 | 0.34 | 0.57 | 0.12 | 17.79 |
| | **Grand Total** | 1,509,557 | 1,509.56 | 258.66 | 589.63 | 589.63 | 5,069.66 | 1,154.80 | 411.67 |

**Appendix B.** Computation of operating expense (OpEx) gap

| Cluster no. | Name of protected area | Total area (ha) | 2009 total operating expenses | 2009 operating expenses/ ha | Exchange rate-adjusted 2009 OpEx | Exchange rate-adjusted 2009 OpEx/ha | Average exchange rate-adjusted OpEx/ha in cluster | Highest exchange rate-adjusted OpEx/ha in cluster | OpEx gap/ha in cluster | Total gap in OpEx (OpEx gap/ha x total area in ha) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Agoo-Damortis Protected Landscape and Seascape (ADPLS) | 210.00 | 824,477.00 | 3,926 | 17,378 | 83 | 102.52 | 1,249.66 | 20 | 4,151 |
| 1 | Alabat Watershed Forest Reserve | 688.00 | 84,000.00 | 122 | 1,770 | 3 | 102.52 | 1,249.66 | 100 | 68,763 |
| 1 | Alburquerque-Loay-Loboc Protected Landscape/Seascape | 93.12 | 114,000.00 | 1,224 | 2,403 | 26 | 102.52 | 1,249.66 | 77 | 7,144 |
| 1 | Aliguay Island Protected Landscape/Seascape | 62.00 | 111,200.00 | 1,794 | 2,344 | 38 | 102.52 | 1,249.66 | 65 | 4,012 |
| 1 | Apo Island Protected Landscape and Seascape | 62.67 | 360,000.00 | 5,744 | 7,588 | 121 | 102.52 | 1,249.66 | 1,129 | 70,728 |
| 1 | Apo Reef Natural Park | 29.00 | 1,705,533.00 | 58,811 | 35,948 | 1,240 | 102.52 | 1,249.66 | 10 | 292 |
| 1 | Bacolod-Kauswagan Protected Landscape and Seascape | 200.00 | 37,440.00 | 187 | 789 | 4 | 102.52 | 1,249.66 | 99 | 19,715 |
| 1 | Bangan Hill National Park | 13.00 | 117,000.00 | 9,000 | 2,466 | 190 | 102.52 | 1,249.66 | 1,060 | 13,779 |
| 1 | Bigbiga Protected Landscape | 136.00 | 276,000.00 | 2,029 | 5,817 | 43 | 102.52 | 1,249.66 | 60 | 8,125 |
| 1 | Buenavista Protected Landscape | 284.00 | 120,000.00 | 423 | 2,529 | 9 | 102.52 | 1,249.66 | 94 | 26,586 |
| 1 | Calauag Watershed Forest Reserve | 328.00 | 10,800.00 | 33 | 228 | 1 | 102.52 | 1,249.66 | 102 | 33,399 |
| 1 | Caramoan National Park | 347.00 | 297,200.00 | 856 | 6,264 | 18 | 102.52 | 1,249.66 | 84 | 29,310 |
| 1 | Cassamata Hill National Park | 57.00 | 28,000.00 | 491 | 590 | 10 | 102.52 | 1,249.66 | 92 | 5,253 |
| 1 | Cuatro Islas Protected Landscape/Seascape | 103.00 | 113,080.00 | 1,098 | 2,383 | 23 | 102.52 | 1,249.66 | 79 | 8,176 |
| 1 | Island of Alibijaban | 430.00 | 141,200.00 | 328 | 2,976 | 7 | 102.52 | 1,249.66 | 96 | 41,107 |
| 1 | Jose Rizal Memorial Protected Landscape | 439.00 | 120,000.00 | 273 | 2,529 | 6 | 102.52 | 1,249.66 | 97 | 42,477 |
| 1 | Kuapnit Balinsasayao Natural Park | 364.00 | 1.00 | 0 | 0 | 0 | 102.52 | 1,249.66 | 103 | 37,317 |
| 1 | Lagonoy Natural Biotic Area | 445.00 | 17,000.00 | 38 | 358 | 1 | 102.52 | 1,249.66 | 102 | 45,263 |
| 1 | Lake Malimanga Bird and Fish Sanctuary | 9.00 | 1.00 | 0 | 0 | 0 | 102.52 | 1,249.66 | 103 | 923 |

*Appendix B continued*

| Cluster no. | Name of protected area | Total area (ha) | 2009 total operating expenses | 2009 operating expenses/ ha | Exchange rate-adjusted 2009 OpEx | Exchange rate-adjusted 2009 OpEx/ha | Average exchange rate-adjusted OpEx/ha in cluster | Highest exchange rate-adjusted OpEx/ha in cluster | OpEx gap/ha in cluster | Total gap in OpEx (OpEx gap/ha x total area in ha) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Libmanan Caves | 19.00 | 1,126,500.00 | 59,289 | 23,743 | 1,250 | 102.52 | 1,249.66 | - | - |
| 1 | Libunao Protected Landscape | 47.00 | 276,000.00 | 5,872 | 5,817 | 124 | 102.52 | 1,249.66 | 1,126 | 52,916 |
| 1 | Lopez Watershed Forest Reserve | 418.00 | 49,200.00 | 118 | 1,037 | 2 | 102.52 | 1,249.66 | 100 | 41,816 |
| 1 | Maulawin Spring Protected Landscape | 149.00 | 160,000.00 | 1,074 | 3,372 | 23 | 102.52 | 1,249.66 | 80 | 11,903 |
| 1 | Mulanay Watershed Forest Reserve | 26.00 | 59,000.00 | 2,269 | 1,244 | 48 | 102.52 | 1,249.66 | 55 | 1,422 |
| 1 | Murcielagos Island Protected Landscape and Seascape | 15.00 | 126,500.00 | 8,433 | 2,666 | 178 | 102.52 | 1,249.66 | 1,072 | 16,079 |
| 1 | Paoay Lake National Park | 340.00 | 120,000.00 | 353 | 2,529 | 7 | 102.52 | 1,249.66 | 95 | 32,327 |
| 1 | Pujada Bay Protected Landscape/Seascape | 200.70 | 313,200.00 | 1,561 | 6,601 | 33 | 102.52 | 1,249.66 | 70 | 13,974 |
| 1 | Rasa Island Wildlife Sanctuary | 943.00 | 506,000.00 | 537 | 10,665 | 11 | 102.52 | 1,249.66 | 91 | 86,010 |
| 1 | Selinog Island Protected Landscape and Seascape | 70.00 | 31,000.00 | 443 | 653 | 9 | 102.52 | 1,249.66 | 93 | 6,523 |
| 1 | Sta. Lucia Protected Landscape | 174.00 | 26,000.00 | 149 | 548 | 3 | 102.52 | 1,249.66 | 99 | 17,290 |
| 1 | Surigao Watershed Resource Reserve | 967.00 | 142,725.00 | 148 | 3,008 | 3 | 102.52 | 1,249.66 | 99 | 96,128 |
| 1 | Taklong Island National Marine Reserve | 187.45 | 230,000.00 | 1,227 | 4,848 | 26 | 102.52 | 1,249.66 | 77 | 14,369 |
| 1 | Tanap Watershed Forest Reserve | 40.00 | 48,000.00 | 1,200 | 1,012 | 25 | 102.52 | 1,249.66 | 77 | 3,089 |
| 1 | Tibiang-Damagandong Watershed | 280.00 | 49,200.00 | 176 | 1,037 | 4 | 102.52 | 1,249.66 | 99 | 27,668 |
| 1 | Torrijos Watershed Forest Reserve | 105.00 | 106,200.00 | 1,011 | 2,238 | 21 | 102.52 | 1,249.66 | 81 | 8,526 |
| **1** | **Total** | **8,280.94** | **7,846,457.00** | **170,239** | **165,381** | **3,588** | **3,588.17** | **43,737.93** | **6,883** | **896,562** |
| 2 | Alijawan-Cansuhay- Anibongan River WFR | 3,630.00 | 135,000.00 | 37 | 2,845 | 1 | 3.25 | 22.87 | 2 | 8,958 |
| 2 | Balbalasang Balbalan National Park | 1,338.00 | 159,666.00 | 119 | 3,365 | 3 | 3.25 | 22.87 | 1 | 985 |
| 2 | Baua Watershed Forest Reserve | 8,955.00 | 196,000.00 | 22 | 4,131 | 0 | 3.25 | 22.87 | 3 | 24,986 |

*Appendix B continued*

| Cluster no. | Name of protected area | Total area (ha) | 2009 total operating expenses | 2009 operating expenses/ ha | Exchange rate-adjusted 2009 OpEx | Exchange rate-adjusted 2009 OpEx/ha | Average exchange rate-adjusted OpEx/ha in cluster | Highest exchange rate-adjusted OpEx/ha in cluster | OpEx gap/ha in cluster | Total gap in OpEx (OpEx gap/ha x total area in ha) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Bessang Pass Natural Monument/Landmark | 1,121.10 | 91,000.00 | 81 | 1,918 | 2 | 3.25 | 22.87 | 2 | 1,727 |
| 2 | Bicol Natural Park | 5,201.00 | 888,800.00 | 171 | 18,733 | 4 | 3.25 | 22.87 | 19 | 100,219 |
| 2 | Cabilao-Sandigan Island Mangrove Swamp Forest Reserve | 1,242.50 | 565,757.14 | 455 | 11,925 | 10 | 3.25 | 22.87 | 13 | 16,493 |
| 2 | Calauit Safari Park | 3,760.00 | 4,080,000.00 | 1,085 | 85,995 | 23 | 3.25 | 22.87 | - | - |
| 2 | Chocolate Hills Natural Monument | 14,145.00 | 75,000.00 | 5 | 1,581 | 0 | 3.25 | 22.87 | 3 | 44,412 |
| 2 | Great and Little Sta. Cruz Islands Protected Landscape & Seascape | 3,425.00 | 356,500.00 | 104 | 7,514 | 2 | 3.25 | 22.87 | 1 | 3,622 |
| 2 | Ilocos Norte Metro WFR | 2,065.00 | 78,000.00 | 38 | 1,644 | 1 | 3.25 | 22.87 | 2 | 5,070 |
| 2 | Kalbario-Patapat Natural Park | 3,800.00 | 112,000.00 | 29 | 2,361 | 1 | 3.25 | 22.87 | 3 | 9,995 |
| 2 | Lidlidda Protected Landscape | 1,157.43 | 26,000.00 | 22 | 548 | 0 | 3.25 | 22.87 | 3 | 3,215 |
| 2 | Magapit Protected Landscape | 3,404.00 | 30,000.00 | 9 | 632 | 0 | 3.25 | 22.87 | 3 | 10,436 |
| 2 | Manleluag Spring Protected Landscape | 1,935.00 | 360,000.00 | 186 | 7,588 | 4 | 3.25 | 22.87 | 19 | 36,668 |
| 2 | Marcos Hi-way Watershed Forest Reserve | 6,105.00 | 216,000.00 | 35 | 4,553 | 1 | 3.25 | 22.87 | 3 | 15,298 |
| 2 | Marinduque Wildlife Sanctuary | 8,828.00 | 400,000.00 | 45 | 8,431 | 1 | 3.25 | 22.87 | 2 | 20,274 |
| 2 | Mayon Volcano Natural Park | 5,775.75 | 464,000.00 | 80 | 9,780 | 2 | 3.25 | 22.87 | 2 | 9,000 |
| 2 | Mt. Inayawan Range Natural Park | 3,986.00 | 636,000.00 | 160 | 13,405 | 3 | 3.25 | 22.87 | 20 | 77,759 |
| 2 | Mt. Pulag National Park | 11,550.00 | 1,230,683.00 | 107 | 25,939 | 2 | 3.25 | 22.87 | 1 | 11,616 |
| 2 | Mt. Timolan Protected Landscape | 1,995.00 | 500,000.00 | 251 | 10,539 | 5 | 3.25 | 22.87 | 18 | 35,089 |
| 2 | Nothern Luzon Heroes Hill National Park | 1,316.00 | 276,000.00 | 210 | 5,817 | 4 | 3.25 | 22.87 | 18 | 24,281 |
| 2 | Olango Island Wildlife Sanctuary | 1,030.00 | 432,000.00 | 419 | 9,105 | 9 | 3.25 | 22.87 | 14 | 14,452 |
| 2 | Palaui Island Protected Landscape & Seascape | 3,000.00 | 360,000.00 | 120 | 7,588 | 3 | 3.25 | 22.87 | 1 | 2,167 |

*Appendix B continued*

| Cluster no. | Name of protected area | Total area (ha) | 2009 total operating expenses | 2009 operating expenses/ ha | Exchange rate-adjusted 2009 OpEx | Exchange rate-adjusted 2009 OpEx/ha | Average exchange rate-adjusted OpEx/ha in cluster | Highest exchange rate-adjusted OpEx/ha in cluster | OpEx gap/ha in cluster | Total gap in OpEx (OpEx gap/ha x total area in ha) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Rajah Sikatuna Protected Landscape | 10,453.00 | 132,000.00 | 13 | 2,782 | 0 | 3.25 | 22.87 | 3 | 31,206 |
| 2 | Timpoong and Hibok-hibok Natural Monument | 2,228.00 | 436,000.00 | 196 | 9,190 | 4 | 3.25 | 22.87 | 19 | 41,767 |
| 2 | Wangag Watershed Forest Reserve | 6,992.00 | 76,000.00 | 11 | 1,602 | 0 | 3.25 | 22.87 | 3 | 21,133 |
| **2** | **Total** | **118,437.78** | **12,312,406.14** | **4,011** | **259,511** | **85** | **84.54** | **594.65** | **177** | **570,828** |
| 3 | Agusan Marsh Wildlife Sanctuary | 19,197.00 | 2,530,000.00 | 132 | 53,325 | 3 | 0.87 | 2.78 | - | - |
| 3 | Alamio, Buyaan, Carac-an, Panikian Rivers and Sipangpang Falls Watershed Forest Reserve | 43,601.00 | 440,400.00 | 10 | 9,282 | 0 | 0.87 | 2.78 | 1 | 28,476 |
| 3 | Cabadbaran Watershed | 16,025.00 | 19,150.00 | 1 | 404 | 0 | 0.87 | 2.78 | 1 | 13,474 |
| 3 | Catanduanes Watershed Forest Reserve | 26,010.00 | 363,150.00 | 14 | 7,654 | 0 | 0.87 | 2.78 | 1 | 14,871 |
| 3 | El Nido Managed Resource Protected Area | 36,018.00 | 826,920.00 | 23 | 17,429 | 0 | 0.87 | 2.78 | 0 | 13,763 |
| 3 | Lower Agno Watershed Forest Reserve | 39,304.00 | 540,800.00 | 14 | 11,399 | 0 | 0.87 | 2.78 | 1 | 22,639 |
| 3 | Mt. Kalatungan Range Natural Park | 21,248.00 | 1,518,000.00 | 71 | 31,995 | 2 | 0.87 | 2.78 | 1 | 27,027 |
| 3 | Mt. Kanlaon Natural Park | 24,388.00 | 2,628,000.00 | 108 | 55,391 | 2 | 0.87 | 2.78 | 1 | 12,354 |
| 3 | Mt. Kitanglad Natural Park | 31,235.00 | 1,796,208.00 | 58 | 37,859 | 1 | 0.87 | 2.78 | 2 | 48,905 |
| 3 | Mt. Malindang Range Natural Park | 53,262.00 | 1,483,221.25 | 28 | 31,262 | 1 | 0.87 | 2.78 | 0 | 14,863 |
| 3 | Siargao Island Protected Landscape and Seascape (SIPLS) | 62,796.00 | 1,040,000.00 | 17 | 21,920 | 0 | 0.87 | 2.78 | 1 | 32,462 |
| 3 | Talavera Watershed Reservation | 37,156.00 | 675,000.00 | 18 | 14,227 | 0 | 0.87 | 2.78 | 0 | 17,950 |
| **3** | **Total** | **410,240.00** | **13,860,849.25** | **493** | **292,148** | **10** | **10.39** | **33.33** | **8** | **246,784** |
| 4 | Allah Valley Watershed Forest Reserve | 101,982.00 | 8,590,800.00 | 84 | 181,070 | 2 | 0.42 | 1.78 | - | - |

*Appendix B continued*

| Cluster no. | Name of protected area | Total area (ha) | 2009 total operating expenses | 2009 operating expenses/ ha | Exchange rate-adjusted 2009 OpEx | Exchange rate-adjusted 2009 OpEx/ha | Average exchange rate-adjusted OpEx/ha in cluster | Highest exchange rate-adjusted OpEx/ha in cluster | OpEx gap/ha in cluster | Total gap in OpEx (OpEx gap/ha x total area in ha) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Batanes Protected Landscape & Seascape | 213,578.00 | 443,291.00 | 2 | 9,343 | 0 | 0.42 | 1.78 | 0 | 81,013 |
| 4 | Mt. Mantalingahan Protected Landscape | 120,457.00 | 1,109,550.00 | 9 | 23,386 | 0 | 0.42 | 1.78 | 0 | 27,574 |
| 4 | Pantabangan-Carranglan Watershed Reservation | 84,500.00 | 114,450.00 | 1 | 2,412 | 0 | 0.42 | 1.78 | 0 | 33,336 |
| 4 | Peñablanca Protected Landscape/Seascape | 118,781.58 | 328,500.00 | 3 | 6,924 | 0 | 0.42 | 1.78 | 0 | 43,328 |
| 4 | Samar Island Natural Park | 333,300.00 | 6,928,000.00 | 21 | 146,023 | 0 | 0.42 | 1.78 | 1 | 445,754 |
| **4** | **Total** | **972,598.58** | **17,514,591.00** | **120** | **369,158** | **3** | **2.54** | **10.65** | **3** | **631,005** |
| **Grand Total** | | **1,509,557.30** | **51,534,303.39** | **174,864** | **1,086,198** | **3,686** | **3,685.64** | **44,376.56** | **7,070** | **2,345,179** |

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