# Gender-responsive Toolkit on Ecotourism Planning and Management

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GREAT Women Project Management Office
Philippine Commission on Women (PCW)

Protected Areas and Wildlife Bureau
Department of Environment and Natural Resources (DENR)

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# Message

Tourism is one of the major sectors that drive our economy. In the tourism industry, it is mainly the women who are in the forefront of tourism – related activities. Undoubtedly, the heavy influx of tourists also brings about environmental degradation; hence the term ecotourism was coined to ensure that tourism activities will not have adverse effects on the natural environment. Although ecotourism is becoming widely – known, women's roles and participation in various ecotourism activities are still understated and not considered in ecotourism planning and management.

The Philippine Commission on Women (PCW) through the Gender Responsive Economic Actions for the Transformation of Women (GREAT) Project, partnered with the Protected Areas and Wildlife Bureau of the Department of Environment and Natural Resources in the development of this Tool Kit which aims to provide information to LGUs and protected area managers in preparing and developing their ecotourism management plans and ensuring that ecotourism strategies are gender responsive.

The PCW commends the Protected Areas and Wildlife Bureau for developing this tool kit and I would like to thank the Department of Foreign Affairs, Trade and Development (DFATD) of Canada for their untiring support to the GREAT Women Project. As we work together as partners in the dissemination and utilization of this Tool Kit, we look forward to seeing more women participating and benefiting from ecotourism activities

Remedios I. Rikken

REMEDIOS I. RIKKEN
Chairperson
Philippine Commission on Women

# Message

The Government of Canada considers support for women's economic empowerment as a critical component of its development assistance program in the Philippines. Given our focus on achieving sustainable and inclusive growth in the Philippines, we are pleased with the release of the "Communication Guide for Women's Economic Empowerment (WEE)" under the Gender-Responsive Economic Actions for the Transformation (GREAT) of Women Project.

The guide is a welcome addition to the growing literature and evidence supporting the fact that investing in women's economic empowerment sets a direct path towards gender equality, poverty eradication and inclusive economic growth. But more than this, the Guide is a practical tool for communicating women's economic empowerment principles, processes, and analysis that would help local government units, particularly their enterprise development desks in assisting women's groups, micro entrepreneurs, and other interested parties in helping women access and benefit from economic opportunities. For those LGUs which have shown interest in replicating the WEE approaches of the GREAT Women project, this guide is also for you.

Congratulations go to the Philippine Commission on Women and the project team for their painstaking dedication in ensuring that all the useful and relevant lessons learned in implementing the GREAT Women project are captured in this publication for sharing and wider application.

We are confident that this publication will continue to build capacity and expertise at the local and national levels among those with the responsibility to ensure that women participate equally with men in accessing productive resources and opportunities.

In closing, the Government of Canada, through its official development assistance program, remains committed to supporting gender equality and women's empowerment in the Philippines.

Mabuhay!

LUKE MYERS
Head of Development Cooperation
Embassy of Canada, Manila

# Message

The Philippines is endowed with a rich diversity of its natural assets. Spread throughout the country is an enormous wealth of cultural and natural heritage, giving the Philippines a competitive advantage in the region, and providing a major precondition for the development of ecotourism.

Ecotourism is a business development initiative that aims to protect nature and reinforces people's positive practices and attitudes towards biodiversity conservation. It can be used as a tool for economic growth in some of our less developed rural areas. It can prove to be one of the most viable income generating opportunities for people bordering our expansive forests and protected areas.

Through the GREAT Women Project, we came up with a gender responsive and user-friendly Ecotourism Toolkit that will help us implement an ecotourism program that integrates biodiversity conservation in the planning and that would attract investments for this important sub-sector of the national economy. We are convinced that by mobilizing both women and men in committing to support the development of ecotourism, we are making another strategic step towards the country's economic prosperity.

THERESA MUNDITA S. LIM
Director, Protected Areas and Wildlife Bureau
Department of Environment and Natural Resources

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# Introduction

## RATIONALE

Traditionally, development is defined in economic terms and focuses on concerns like market growth, modernization, infrastructure improvement, trade, and employment, among others. Alternatively, development refers to the sustained capacity of an individual to achieve a better life. This means an individual is able to live longer and enjoy good health, has access to basic education, and can participate in political activities and governance. Development provides opportunities to broaden one's capacity to do and capacity to be.

The Gender and Development (GAD) Approach focuses on the relations between men and women. It considers the unequal relations of power, which prevents equitable development and women's full participation. GAD is a development perspective recognizing that women are active agents of development and not just passive recipients of development assistance. In a way, GAD promotes a positive bias for women since they are generally more excluded or disadvantaged in social and economic resources as well as decision-making.

Gender issues refer to all problems arising from stereotypes of males and females in relation to appropriate gender roles, behaviors, and activities. Some common gender issues include women not being able to go to school because they are only seen as future mothers, and women not promoted to top ranks because of the common notion that men better fit such leadership positions.

Sex and gender are two different concepts. Sex refers to the biological differences between males and females, and is based on the genitalia and reproductive organs; hence, it is fixed. In contrast, gender refers to the differentiated social roles, behaviors, capacities, and intellectual, emotional, and social characteristics attributed by a given culture to women and men. It is a

variable concept since its construction varies across cultures and over time. Gender is acquired through socialization.

During social surveys, only men are interviewed since they are the perceived heads of the household. This practice leads to the non-inclusion of women's views and perspectives. Technologies are also often designed with men as users of the prototype thereafter causing possible displacement of women. All these tend to limit the women's capacity to participate in various social/community activities.

Gender issues emanate from gender biases in society. Though causes are cultural, they are usually based on biophysical characteristics. In most cultures, women are considered physically weak. Valued only as child-bearers, most cultures have perpetuated practices and belief systems reinforcing these biophysical assumptions. Furthermore, some institutions practice and reinforce gender biases (e.g., family, religious institutions, school, popular culture, and mass media). However, since gender bias is cultural, given proper intervention and priority, it can be removed.

The GAD approach argues that although women have always been integrated into development processes, the said processes are essentially flawed. Development policies should not isolate women's productive or reproductive roles; they are intertwined in women's lives. Hence, the GAD approach strategy seeks to identify and address both practical and strategic gender needs determined by women and men to improve further their condition. Practical gender needs refer to the concrete needs of human beings in order to survive and advance economically. These include food, clothing, shelter, health care, and income generating opportunities. Meanwhile, strategic gender interests are the relative status of women compared to men. It seeks to bring about greater equality and eliminate sexual discrimination. Examples of these include legal rights, protection from domestic violence, increased decision-making capability, and greater control over one's body.

Successful development does not just "target" women; it should empower them. The solutions forwarded by the GAD approach transform unequal power relations by empowering women. In this context, Empowerment may be defined as a process through which women and men in disadvantaged positions increase their access to knowledge, resources, and decision-making.

Empowerment also raises both women and men's awareness in terms of actively participating in their communities to reach a level of control over their own environment.

## GENDERIZING NATURAL RESOURCE MANAGEMENT

An example of a development process wherein the disadvantages of women over men are evident is in natural resource management (NRM). NRM projects typically include social forestry, ecotourism, and community-based and coastal resource management projects. Such initiatives should identify existing and possible gender issues that may arise when a proposed project or intervention is implemented.

According to the GAD checklist for NRM projects, gender issues in the NRM sector are related to inequalities in the status and condition of women and men in different resource areas. These gender gaps or inequalities are manifested by the following:

- Norms, attitudes, and institutions that limit women's and men's life options;
- Women's limited access to land and natural resources;
- Low participation of women in governance or decision-making processes and in project activities;
- Gender-role stereotyping and women's multiple burdens, and various forms of violence against women and girls;
- Unequal access to resources and services to improve their productive and reproductive work; and
- Limited access to education and health services.

Ideally, NRM projects are designed to contribute to the achievement of gender equality results, such as:

- Greater access to and control by women over agroforestry and coastal management technologies, training credit, markets, and information;
- Increased proportion of women recipients of stewardship contracts;
- Increased proportion of women adopting new technologies or activities that do not deplete the natural resources;
- Increased leadership capacity of women involved in farmers' or fishers' associations

organized by the project;
- Greater economic options for women farmers; and
- A development agency's improved capacity to plan, design, implement, and monitor programs and projects that address gender issues and concerns of women farmers or fishers.

## ECOTOURISM AS AN NRM PROJECT

Ecotourism falls under NRM and is a subset of sustainable tourism. In recent years, many have realized that while the tourism industry contributes greatly to the world's gross national product, it also negatively affects the local host communities and the environment. Hence, "ecotourism" became a buzzword in the sustainable development agenda. Alongside emerging challenges in NRM like biodiversity loss and deforestation, sustainability in tourism industry has also become increasingly imminent.

Ecotourism as defined under the National Ecotourism Strategy and Action Plan is a sustainable form of tourism in the natural and cultural heritage area where community participation, protection and management of natural resources, culture and indigenous knowledge and practices, environmental education and ethics as well as economic benefits are fostered and pursued for the enrichment of host communities and satisfaction of visitors.

Ecotourism management and development anchors on these internationally accepted principles:

- Conservation and sustainable use of biodiversity;
- Ownership by the local communities providing them business opportunities to sustain their well-being;
- Gender responsiveness and adherence to inclusive growth that considers women, children, indigenous peoples and informal sector activities;
- Promotion of learning experience and conservation awareness;
- Responsible action on the part of tourists and the tourism industry; and
- Delivery to appropriate number of participants and businesses that observe and follow ecotourism and conservation concepts, ensuring appropriate development and visitor control.

## ECOTOURISM AND WOMEN

When looking at the lens of ecotourism and women, the most pressing problem that often arises is the notion that tourism (in general) is equated with prostitution. As such, instead of elevating the social status of women, tourism becomes an instrument for further exploitation of women. This marginalization of women should be addressed and dealt with accordingly.

Pleno (2006), a local researcher, studied the Cambuhat Village and River Tour in the municipality of Buenavista and the newly established Community Life Tours of Maribojoc in the municipality of San Miguel, both in the province of Bohol, Philippines. He found that ecotourism projects promoted sociopolitical empowerment among women. There was also significant relationship between women's empowerment and environmental awareness. Moreover, ecotourism was perceived to have raised the level of women's participation in promoting environmental conservation.

Overall, ecotourism should be used as a tool to empower women economically and socially. In its pursuit, women should develop the values of self-reliance and self-confidence.

# Mainstreaming Gender-responsiveness in Ecotourism Planning and Management

To infuse **GENDER RESPONSIVENESS** in the ecotourism management planning process, the following guidelines should be observed:

**Guide No. 1**

Aside from identifying the area's ecotourism potentials, determine possible participation of women and men in the proposed project. Sample questions that infuse gender responsiveness include:

- Has the project consulted women on the problem or issue that the intervention must solve and on the development of the solution?
- Have the women's inputs been considered in the project design?
- Are both women and men seen as stakeholders, partners, or agents of change in the project design?

**Guide No. 2**

Identify existing gender issues, as well as possible related concerns, that may arise; this is where gender analysis is put into practice. Draw out issues related to gender roles, needs, access to and control of resources, and constraints and opportunities faced by women and men. Gaps should be presented in the discussion of development issues during project document.

Gender analysis refers to the systematic gathering and examination of information on gender differences and social relations. Gender analysis helps identify, understand, and redress inequities/ inequalities between women and men, as well as constraints to women's empowerment. It assesses

the differential impact of proposed and/or existing policies, projects/programs, and legislation on women and men. The process on gender analysis focuses on:

- an appreciation of gender differences in terms of their respective needs and roles;
- an understanding of the nature of relationships between women and men, and their social realities, life expectations, and economic circumstances; and
- a recognition of the differential access to and control over resources by women and men.

Some of the known tools when conducting gender analysis include:

- REVIEW OF BASIC GENDER AND DEVELOPMENT (GAD)CONCEPTS AND GENDER ISSUES: Stakeholders should be educated on basic GAD concepts and principles to contribute to current knowledge. This may be done through a series of lectures and training.

- APPRECIATING GENDER DIFFERENCES: Determine the community's views and perspectives on gender differences by asking them to write down their ideas and perceptions of men and women (Template 1). This helps reveal whether there is gender stereotyping among stakeholders in the community.

**TEMPLATE 1. APPRECIATING GENDER DIFFERENCES (SAMPLE ENTRIES)**

| MALE ATTRIBUTES | FEMALE ATTRIBUTES |
|---|---|
| Strong | Motherhood |
| Father figure | Household chores |
| Worker | Pregnancy and child birth |
| (...and the list goes on) | (...and the list goes on) |

- ANALYSIS OF THE DAILY ACTIVITIES, ALSO KNOWN AS THE "24-HOUR CALENDAR": Ask both women and men to accomplish a 24-hour calendar detailing their activities in the community (Template 2, p. ix). The listing is then compared to determine where the various roles and responsibilities of women and men fall either within the production or reproduction sphere:

*PRODUCTIVE WORK involves the production of goods and services for exchange. It is not for meant immediate consumption, and participation is usually paid to generate income. Generally, productive work is viewed as part of the men's sphere.*

*REPRODUCTIVE WORK not only covers biological reproduction, but also caring for family members and managing the household. Common examples include child bearing and rearing, food preparation, and water and fuel collection. Although considered vital and indispensable to family survival and social sustainability, reproductive work is not assigned any economic value. Hence, it is often invisible, unrecognized and undervalued. It is considered part of the women's sphere.*

- HARVARD ANALYTICAL FRAMEWORK, also called the Gender Analysis Framework: This tool is one of the earliest gender analysis and planning frameworks developed by researchers at the Harvard Institute of International Development (HIID) in collaboration with USAID's Office of Women in Development. It systematizes attention to both women and men and their different positions in society. It is based upon the perspective that allocating resources to women (and men) in the development effort makes economic sense and will make development work in general more efficient. This tool highlights three important points:

  *ACTIVITY PROFILE details gender division of labor and gender needs. It should acknowledge varying needs and priorities of women and men in environmental management, resource use, and conservation.*

  *ACCESS TO AND CONTROL OF NATURAL RESOURCES measures whether women and men have adequate and equal access to information, including those about the proposed ecotourism plan. It also indicates how the project can affect how women and men carry out their works and responsibilities.*

  *INFLUENCING FACTORS IN THE CONTEXT OF CONSTRAINTS AND OPPORTUNITIES show whether the project devised strategies to overcome constraints (including mobility and time) to project participation by women and men.*

**TEMPLATE 2. THE 24-HOUR ACTIVITY CALENDAR**

| | MALE | FEMALE |
|---|---|---|
| 4:00 AM | Sample entry: Go fishing | Sample entry: Prepare breakfast |
| 5:00 | | |
| 6:00 | | |
| 7:00 | | |
| 8:00 | | |
| 9:00 | | |
| 10:00 | | |
| 11:00 | | |
| 12 noon | | |
| 1:00 PM | | |
| 2:00 | | |
| 3:00 | | |
| 4:00 | | |
| 5:00 | | |
| 6:00 | | |
| 7:00 | | |
| 8:00 | | |
| 9:00 | | |
| 10:00 | | |
| 11:00 | | |
| 12 midnight | | |
| 1:00 AM | | |
| 2:00 | | |
| 3:00 | | |

**Guide No. 3**

Design strategies that can address the identified gender issues relevant to a proposed/existing project. This guideline helps identify what needs to be done in terms of policies, programs, and services, and how the project partners can be assisted more effectively. It also anticipates the impacts of the said proposals on both women and men; flag risks and challenges that are gender-related; and helps identify appropriate approaches to make policies and programs more effective.

Sex-disaggregated data and gender-related information should also be gathered. If none, the project proponent needs to conduct a benchmark study, which shall serve as baseline data for future use and reference. This can also be a useful tool when monitoring project outcomes and making projections/trends.

**Guide No. 4**

Some other important data that need to be collected include number of women in the area and their demographics (i.e., age, educational attainment, civil status, and religion). Data concerning women employment should also be gathered, as well as incidences of violence against women (if any). These should be consolidated and analyzed to help identify socioeconomic gaps. A database of sex-disaggregated data should be established.

**Guide No. 5**

Establish enabling mechanisms and support systems to ensure that gender responsiveness is mainstreamed in local development planning.

# IN THIS SEGMENT

DENR ADMINISTRATIVE ORDER NO. 2013-19 GUIDELINES ON ECOTOURISM PLANNING AND MANAGEMENT IN PROTECTED AREAS

ANNEX A: ECOTOURISM PLANNING AND MANAGEMENT PROCESS

ANNEX B: ECOTOURISM PLANNING PROCESS

ANNEX C: BUSINESS PLANNING PROCESS

# DENR Administrative Order No. 2013-19 Guidelines on Ecotourism Planning and Management in Protected Areas

Pursuant to Executive Order 192 (Reorganization Act of the Department of Environment and Natural Resources), Republic Act No. 7586 (National Integrated Protected Areas System Act of 1992), Executive Order No. 111 (Guidelines for Ecotourism Development in the Philippines), Republic Act No. 9593 (Tourism Act of 2009), Republic Act No. 9710 (Magna Carta of Women), and other relevant issuances, and in order to provide direction in ecotourism planning and management in protected areas, this Order is hereby issued for the guidance of all concerned.

## SECTION 1. BASIC POLICY

It is the policy of the State to ensure the sustainable use, development, management, protection and conservation of the country's environment and natural resources for the enjoyment of the present and future generations. It is also the policy of the State to recognize sustainable tourism development as integral to the national socio-economic development efforts to improve the quality of life of the Filipino people providing the appropriate attention and support for the growth of this industry; and promote a tourism industry that is ecologically sustainable, responsible, participative, culturally sensitive, economically viable, and ethically and socially equitable for local communities. Furthermore, the State affirms the role of women in nation building and ensures the substantive equality of women and men. It shall likewise promote empowerment of women, pursue equal opportunities for women and men, and ensure equal access to resources and to development results and outcome.

## SECTION 2. OBJECTIVES

The general objective of this Administrative Order is to recognize and operationalize ecotourism for the conservation and sustainable use of natural resources in protected areas. It shall also have the following specific objectives:

1. To institutionalize ecotourism planning and management process in protected area management;
2. To promote advocacy on the concept and principles of ecotourism;
3. To introduce ecotourism businesses in protected areas both as a conservation strategy and an economic development option through viable business partnerships with the local government units or the private sector;
4. To promote inclusive equity of socio-economic benefits to the local community and indigenous cultural communities and encourage community participation; and
5. To ensure the participation of both women and men in the ecotourism planning and management and that gender-related issues are addressed in the ecotourism management plan.

## SECTION 3. SCOPE AND COVERAGE

This Order shall apply to ecotourism planning and management in protected areas under the National Integrated Protected Area System (NIPAS) identified as having potential for ecotourism development. This may refer to terrestrial, coastal and marine, caves, and wetland ecosystems in NIPAS areas.

## SECTION 4. DEFINITION OF TERMS

For purposes of this Order, the following terms are defined as follows:

1. ***Business Planning*** – refers to the process of identifying long-term goals for a business or business segment, and formulating realistic strategies for reaching those goals. The business plan includes marketing, operation, management and environmental issues besetting a target site.
2. ***Ecotourism*** – refers to a form of sustainable tourism within a natural and cultural heritage area where community participation, protection and management of natural resources, culture and indigenous knowledge and practices, environmental education and ethics as well as

economic benefits are fostered and pursued for the enrichment of host communities and satisfaction of visitors.

3. ***Ecotourism Product*** – refers to a combination of ecotourism resources, facilities, activities and services resulting in enhanced commitment to protect the natural and cultural heritage areas.
4. ***Protected Areas*** – refers to 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 pursuant to the NIPAS Act of 1992 (RA 7586).

## SECTION 5. ECOTOURISM CONCEPTS AND PRINCIPLES

Ecotourism management and development shall be in accordance with the following internationally accepted principles:

1. Conservation and sustainable use of biodiversity;
2. Ownership by the local communities providing them business opportunities to sustain their well-being;
3. Gender responsiveness and adherence to inclusive growth that considers women, children, indigenous peoples and informal sector activities;
4. Promotion of learning experience and conservation awareness;
5. Responsible action on the part of tourists and the tourism industry; and
6. Delivery to appropriate number of participants and businesses that observe and follow ecotourism and conservation concepts, ensuring appropriate development and visitor control.

## SECTION 6. ECOTOURISM PLANNING AND MANAGEMENT PROCESS

The Ecotourism Planning and Management Process is divided into four (4) phases, namely:

1. ***Site Assessment.*** This phase will determine whether or not ecotourism management and development is the right strategy for the protected area. This consists of the following steps:
    a) ***Preliminary Site Evaluation.*** This involves answering basic questions in a checklist in order to determine whether a particular site is appropriate for ecotourism development, and therefore needs to continue with the planning process for ecotourism development in the protected area.

b) ***Full Site Assessment.*** This is conducted to determine the possible extent of ecotourism development that can be done in the site. It will help identify existing situations that either help or constrain ecotourism development in the site. In this phase, sex-disaggregated data and gender-related information should also be collected.

2. ***Ecotourism Planning.*** This involves the formulation of the Ecotourism Management Plan (EMP). The data collected in the Site Assessment phase and the corresponding recommendations shall be the inputs to the formulation of the Plan. The Plan should be consistent with the existing Protected Area Management Plan.

   The PASU shall initiate the preparation of the Ecotourism Management Plan and shall involve concerned stakeholders such as, but not limited to, LGUs, other agencies concerned (e.g. Department of Tourism, NEDA); local communities including women's groups, indigenous cultural communities; and the private sector (e.g. tour operators and investors).

   The process involves preparing the vision, goals, objectives, strategies, programs and projects including identification of possible ecotourism enterprises/businesses that may be developed in the area. These will serve as the bases in the actual physical and program development of ecotourism in the area.

   The component strategies for the formulation of the Ecotourism Management Plan are provided under Section 7 hereof. The approval process for the EMP is provided under Section 8 of this Order.

   Based on the approved Ecotourism Management Plan, business plans shall be formulated in partnership with the LGU or private sector. The business plan is a more detailed review of the specific activity, attraction or service that will be developed. It deals with marketing, operations and management of ecotourism enterprises/businesses.

   An Implementation Plan shall also be prepared to guide the Protected Area Superintendent (PASU) in the execution of the ecotourism activities.

3. ***Implementation***. The implementation of the Ecotourism Management Plan shall be in accordance with the timelines, implementation arrangements and the proposed budget provided in the Implementation Plan. The implementation arrangements are provided under Section 9 hereof.

   The business plans shall be implemented by the LGU or private sector partner. The details of business planning and operation are provided under Section 10 of this Order.

4. ***Monitoring and Evaluation.*** A Monitoring and Evaluation Plan shall be developed to provide for the mechanism of monitoring and evaluating the progress of the Ecotourism Management Plan implementation, and the key indicators for impact monitoring. The details of the Monitoring and Evaluation Scheme are provided under Section 11 hereof.

   The flow chart of the ecotourism planning and management process indicating the timelines and responsibility areas is shown in Annex A while the detailed discussion of the simplified ecotourism planning process is provided in Annex B.

## SECTION 7. COMPONENT STRATEGIES FOR THE FORMULATION OF THE ECOTOURISM MANAGEMENT PLAN

The formulation of the Ecotourism Management Plan shall consist of the following component strategies: 1. Zoning for Visitor Use; 2. Visitor Site Planning and Design; 3. Sustainable Infrastructure Design; 4. Visitor Management; and 5. Revenue Generation.

In carrying out the above strategies, the following shall be taken into consideration:

1. The result of the zoning shall be the basis for selecting and designating Tourism Enterprise Zones (TEZs) as provided for in the Tourism Act;
2. Site planning shall require the preparation of an actual plan and topographic map on which all existing planned ecotourism infrastructure is placed, such as eco-lodges, trails, campsite, visitor center, or toilet facilities.
3. For actual site development, resources to be provided by the DENR shall be used for infrastructure and facilities supporting its mandate on site protection such as Protected Area

Office/station, information center, watch towers, patrol boat, and the like, while the support of the private sector or the LGU shall be engaged for the construction/provision of other visitor facilities/amenities needed for ecotourism development;

4. The sustainable infrastructure design shall be in accordance with the guidelines provided under DAO 2009-09, Standard Design and Specification of Signs, Buildings, facilities and other Infrastructure That May Be Installed and/or Constructed Within Protected Areas or other relevant rules that may be issued by the DENR;
5. Visitor management shall be supported by a carrying capacity study. For this purpose, the DENR shall issue the guidelines for determining the carrying capacity of the ecotourism site;
6. For revenue generation, determination of fees in protected areas shall be in accordance with existing guidelines and other applicable and relevant rules that may be issued by the DENR; and
7. The results of the strategies shall serve as guide in determining the appropriate ecotourism businesses that may be developed and in what specific site these should take place within the protected area.

Detailed discussion of the strategies is provided in Annex B Item 3.B.

## SECTION 8. APPROVAL OF THE ECOTOURISM MANAGEMENT PLAN

Upon completion of the Ecotourism Planning process in accordance with Section 6 hereof, the Ecotourism Management Plan shall be reviewed by the Regional Ecotourism Committee (REC) and if found in order, the REC shall recommend it for approval by the Protected Area Management Board (PAMB).Provided that, if the Plan needs further improvement based on the REC review, the recommendations should be immediately addressed and subsequently, the revised Plan should be submitted for approval.

## SECTION 9. IMPLEMENTATION ARRANGEMENTS

The Protected Area Superintendent (PASU) shall spearhead the implementation of the Ecotourism Management Plan ensuring that all activities in the Plan are followed.

An Ecotourism Sub-committee in the PAMB shall be established to perform the following functions:

a. Advise the lead person/office concerning implementation of the Ecotourism Management Plan;
b. Provide voluntary actual support, both in the field and in the office, if necessary;
c. Serve as liaison to the community and respective sector; and
d. Serve as liaison to the legal entities operating the ecotourism and tourism-related businesses in the ecotourism site.

The PAMB shall formulate implementing site rules and regulations, controlling number of people and their access to facilities of the park, based on the Ecotourism Management Plan.

The PASU shall prepare an annual work plan based on the Ecotourism Management Plan that includes the following:

a. Activities to be conducted
b. Persons responsible for the conduct of activities
c. Location and timeframe of activities
d. Resources to be used to accomplish the activities

Marketing and promotions shall be conducted for the ecotourism product in the site, with assistance and support from the Department of Tourism (DOT) and other partners.

## SECTION 10. ECOTOURISM BUSINESS PLANNING AND OPERATION

The LGU or private sector partner may initiate the preparation of the business plan. The DENR shall provide technical support to communities and other groups who need assistance in the preparation of the business plan. The business planning process and the outline of business plan are provided in Annex C.

Upon review and recommendation by the Regional Ecotourism Committee (REC), the Business Plan for ecotourism projects shall be approved by the PAMB.

For the conduct and operation of ecotourism businesses or enterprises, the PAMB shall engage partners, either the LGU or private sector. The partnership shall be formalized through tenurial instruments like the Special Use Agreement in Protected Areas (SAPA), and the Protected Area Community-based Resource Management Agreement (PACBRMA).

Implementation of the business plan shall also follow all applicable existing rules and regulations implemented by DENR and other government agencies, including LGU laws, rules and regulations.

## SECTION 11. MONITORING AND EVALUATION SCHEME

The implementation of the Ecotourism Management Plan shall be monitored in a two-tiered mechanism. The first tier involves monitoring of the progress of Ecotourism Management Plan implementation. The second tier involves the monitoring of the impacts of the Plan, to determine the effects of ecotourism development and environmental protection in the area, and the community benefits. The DENR and REC shall monitor the implementation of the Ecotourism Management Plan. Other stakeholders may also be involved in the regular monitoring process.

The DENR shall issue the corresponding guidelines prescribing the monitoring tool to be used pursuant to this Section.

## SECTION 12. CAPACITY BUILDING

Ecotourism management and development including business operation require various skills and competencies and should be supported with a capacity building program that will cater to the government implementors, local communities including women's groups, and the indigenous cultural communities. Capacity building shall include providing training, site visits and collaboration with other entities that can help improve the management and implementation capacities of the concerned DENR personnel, other government agencies, LGUs, local communities and other stakeholders. This will be pursued by the DENR in partnership with other government agencies, local government units, civil society, the academe and private sector.

## SECTION 13. INSTITUTIONAL ARRANGEMENTS

Recognizing the fact that tourism and conservation depend largely on networks, institutional arrangements shall be conducted with, but not limited to, the following agencies, as necessary:

1. Planning, Ecotourism Product Development, Marketing and Promotion, – Department of Tourism (DOT), Department of Trade and Industry (DTI) and other marketing institutions;
2. Business Planning – Department of Trade and Industry (DTI), UP Institute of Small Scale Industries (ISSI), non-government organizations (NGOs), and similar institutions;
3. Financial Support – Tourism Infrastructure Enterprise Zone Authority (TIEZA), Local Government Units (LGUs), Overseas Development Assistance (ODA), and other donor agencies.
4. Approval of project proposals – Protected Area Management Board (PAMB) upon review and recommendation of the Regional Ecotourism Committee (REC).

The DENR may request the assistance of other agencies or institutions as may be necessary to support the implementation of ecotourism programs and activities that may be developed pursuant to this Order.

## SECTION 14. FUNDING

The DENR shall allocate funds for the implementation of this Order and encourage contribution from other partners such as national government agencies, LGUs, NGOs and the private sector. Other sources of funds that may be tapped are Overseas Development Assistance and other funding agencies.

Revenues generated from the operation of the ecotourism site shall accrue to the Integrated Protected Area Fund (IPAF) which can be tapped for the implementation of the Ecotourism Management Plan and continued management of the site.

## SECTION 15. TRANSITORY PROVISION

All on-going initiatives and activities on ecotourism in protected areas shall be reviewed by the PAMB and aligned with the principles, concept and processes provided in this Order. Provided that, the DENR shall ensure that environmental safeguards prescribed herein are adhered to and complied within the management and development of ecotourism in protected areas.

## SECTION 16. SEPARABILITY CLAUSE

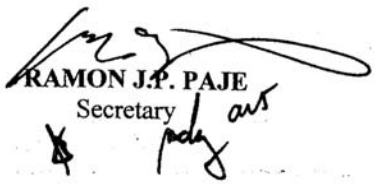
If any provision of this Order is declared unconstitutional or invalid, the same shall not affect the validity of the other provisions hereof.

## SECTION 17. REPEALING CLAUSE

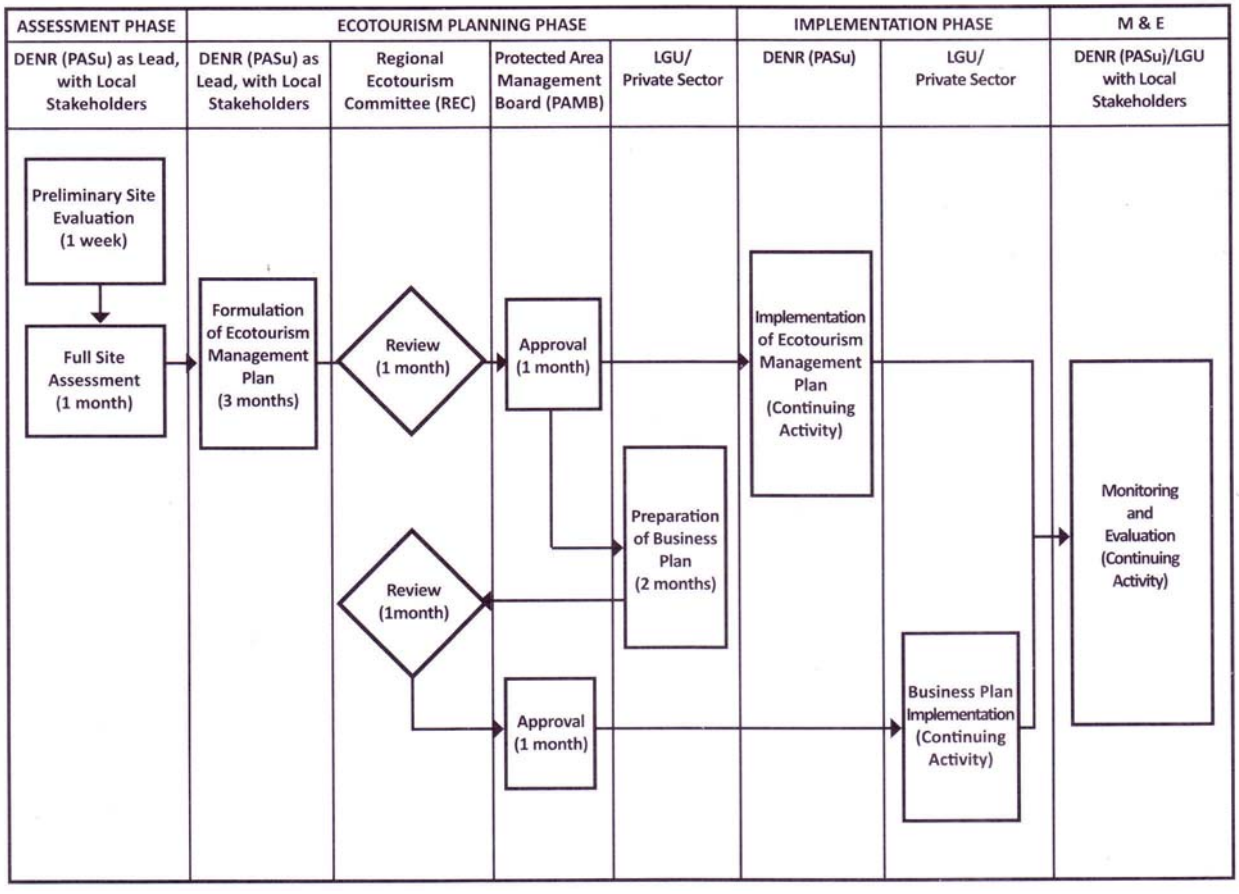
All orders and issuances, rules and regulations, or parts thereof inconsistent with this Order are hereby amended, modified or repealed accordingly.

## SECTION 18. EFFECTIVITY

This Order shall take effect fifteen (15) days after its publication in a newspaper of general circulation and filing of a copy hereof to the Office of the National Administrative Register.

# ANNEX A
# ECOTOURISM PLANNING AND MANAGEMENT PROCESS



# ANNEX B
# ECOTOURISM PLANNING PROCESS

Ecotourism Planning and Management Process is divided into four (4) phases, namely: 1. Site Assessment; 2. Ecotourism Planning; 3. Implementation of the Ecotourism Management Plan; and 4. Monitoring and Evaluation.

The following is a discussion of the simplified process for Ecotourism Planning.

## 1. SITE ASSESSMENT

### a) Preliminary Site Evaluation

The basic assumption for the Preliminary Site Evaluation (PSE) is that the protected area has already undergone a site evaluation as a requirement for the preparation of the Protected Area Management Plan. The information derived from the site evaluation may already be used for purposes of the PSE.

The PSE is a method of answering basic questions in a checklist (see below) in order to determine whether a particular site is appropriate for ecotourism development, and therefore needs to continue with the planning process for ecotourism in the area.

#### Checklist for Preliminary Site Evaluation (PSE)

It is recommended that the checklist be accomplished through a focused group discussion of people who are familiar with the situation in the protected area, and some resource persons from the tourism sector. This collective discussion will provide a better decision of whether to proceed to the ecotourism planning process.

| GUIDE QUESTIONS | RESPONSE | REMARKS |
|---|---|---|
| 1. Are there significant potential natural and/or cultural attractions in the area? | | |
| 2. Can visitor access to the attractions be easily established? | | |
| 3. Can the attractions be protected at an acceptable level from the impacts of visitation? | | |
| 4. Is the area free of security problems and or natural hazards that cannot be effectively controlled by the management of the area or local authorities? | | |
| 5. Does the protected area have sufficient management and administrative authority to effectively manage implementation and monitoring of an ecotourism program at site level? | | |
| 6. Is there a reasonable expectation that initial funding needed to develop ecotourism will be available? | | |
| 7. Are the protected area managers, tour operators and communities willing to conform to ecotourism guidelines, i.e. low impact, small groups, impact monitoring, working with and actively involving communities? | | |
| 8. Will visitation improve biodiversity health or reduce threats to conservation targets? | | |

The response to all the questions should be positive. In case of any negative response, the Focused Group Discussion (FGD) should deliberate on the question and make a collective decision on whether to proceed or not.

## b) Full Site Assessment

Once ecotourism is determined to be appropriate in the area, full site assessment can be conducted to determine the possible extent of ecotourism development that can be done in the site. Full site assessment will help identify existing situations that either help or constrain ecotourism development of the site. As much as possible all information gathered during the site assessment should be sex-disaggregated.

Full site assessment is a data gathering process that involves the following:

### 1. Review of Existing Data

Gather as many written materials necessary for ecotourism planning such as the Protected Area Management Plan and other existing plans, relevant laws, policies, scientific and other technical studies, wildlife inventories, monitoring reports, visitor surveys, tourism statistics, maps, etc. pertaining to the proposed area and the surrounding communities.

### 2. Fieldwork

Fieldwork should be conducted to validate knowledge and information about the protected area. Maps should be prepared and studied in order to become familiar with the general layout of the area, and the location of the natural and cultural features, the trails and infrastructure, and the areas most visited by tourists, and potential areas for ecotourism. Data from fieldwork would include photos, observations, notations on the map, and field notes.

### 3. Interviews

Formal and informal interviews should be done with people who know the protected area in order to gather informed opinions. Informants should include visitors, communities within and adjacent to the area, the personnel of the protected area, and those people involved with programs and

projects in the area such as extension workers, academic/scientific researchers, government workers, etc. As much as possible, there should be a balance in number of men and women respondents.

## 4. Questionnaires and Surveys

When specific answers are needed for specific data needed, questionnaires may be used for the interviews and surveys. Design and conduct of surveys may require the assistance of specialists, NGOs, academe, etc.

## 5. Consultative Meetings and Workshops

Stakeholders should be convened in meetings and workshops to obtain information and opinions about the protected area. These meetings and workshops should also be used to inform the participants about the protected area, the objectives of the protected area, and the reasons for developing ecotourism in the area.

## 6. Preparing the Full Site Assessment Report

All information gathered during this process should be consolidated in a report that should contain the elements discussed below. Recommendations shall be formulated and considered in the preparation of the Ecotourism Management Plan.

Full Site Assessment should focus on the following data categories:

| DATA CATEGORY | QUESTIONS/DATA REQUIREMENTS |
|---|---|
| 1. Natural resources and features | i. What are the natural resources in the area? |
| | ii. Are there flagship species? |
| | iii. Have inventories been done? |
| | iv. What are the endangered species in the area? |
| | v. What are the scenic attractions? |
| | vi. Where are the critical areas needing protection? |
| 2. Cultural resources | i. What are the historical, archaeological or cultural sites? |
| | ii. What are the cultural or historical events that can attract tourism? |
| | iii. What about historical and cultural sites and events in the adjacent areas? |
| | iv. What are the traditional knowledge and practices in the area? |
| | v. Are there other agencies involved in these sites and events? |
| | vi. Are there indigenous peoples in the area? |
| | vii. Will they permit ecotourism development in the area? |
| 3. Protected area management | i. What are the zoning categories in the protected area? |
| | ii. Is there a Protected Area Management Plan? |
| | iii. Is there adequate staffing in the protected area management office? |
| | iv. What are the threats in the area? |
| | v. What are the impacts of visitors in the area? |
| | vi. Are there studies conducted in the area? Who are doing research in the area? |
| | vii. Is monitoring conducted in the area by the protected area staff? |

| | |
|---|---|
| 4. Visitor patterns, activities, infrastructure | i. What are the visitor attractions in the area? |
| | ii. How accessible is the site? |
| | iii. What are the visitor activities in the area? |
| | iv. What are the visitor statistics, are these gender-disaggregated? |
| | v. Have visitor surveys been conducted? |
| | vi. How much fees are paid for entrance, use of facilities, etc.? |
| | vii. What facilities and infrastructure are available and what are the conditions of these? |
| | viii. What are the IEC programs or nature interpretation programs in the area? |
| | ix. Are guides available in the area? |
| 5. Tourism plans and policies | i. Does the Protected Area Management Plan have a chapter on ecotourism? |
| | ii. What are the existing tourism plans in the area? |
| | iii. What are the tourism plans of the LGUs in the area? |
| 6. Communities | i. Are there communities inside and adjacent to the protected area? |
| | ii. What are their economic activities? |
| | iii. Are they involved in tourism activities in the area? |
| | iv. What are their businesses in the area or adjacent area? |
| 7. Partnerships | i. Are there partnerships with LGUs, NGOs, POs, local communities, private sector, academe in the protected area? |
| | ii. What kind of agreements are there? |
| | iii. Are there partnerships with the tourism sector? |
| | iv. Are these partnerships successful? |

| | |
|---|---|
| 8. Marketing and promotions | i. What are the marketing efforts of the protected area management? |
| | ii. Is the protected area well known or does it need more promotion? |
| | iii. What are the promotion activities done by the LGUs, NGOs or government agencies? |
| | iv. What IEC materials are available? |
| 9. Opportunities and threats | i. What new opportunities can be used to enhance ecotourism in the area? |
| | ii. What are the threats to promoting ecotourism in the area? |

## Considerations for Full Site Assessment

The factors to be considered in the Full Site Assessment Process are, namely: 1) Access; 2) Zoning considerations; 3)Tourism built-up area/s; 4) Development limitations; 5) Ecotourism products;6) Ecotourism operation; 7) Community participation; 8) Skills and training of communities; 9) Markets and marketing; 10) Site management; 11) Visitor management; and 12) Partnership.

### 1. Access

Access consideration includes the connecting point used by the tourists to reach the ecotourism site such as the nearest city or town proper. It should also include travel time, modes of transport and number of transfers.

### 2. Zoning Considerations

Zoning is important in ecotourism development as it shows how tourist facilities can be developed. An example would be beach zoning which would indicate setbacks, buffers, and development/ built-up zone.

## 3. Tourism Built-up Area/s

Tourism built-up areas will be the center of development for the tourist facilities, access infrastructure (e.g. parking lot), and administrative facilities. Built-up areas are designed to concentrate development and restrict high level of impacts to a little area as possible to prevent creating impacts to a wider coverage. Tourism built-up areas are also designed to absorb the most number of visitors and use it as a takeoff point to various attractions within the ecotourism site.

## 4. Development Limitations

Development limitations are formulated to prevent unnecessary degradation of the environment because of tourism development. It already sets the limits of development for obvious development possibilities. Examples include setting up of structure at the base of waterfalls, building of structures that will affect the aesthetic value of the sites, limited or no entry to sensitive areas.

## 5. Ecotourism Products

This refers to a combination of ecotourism resources, facilities, activities and services resulting in enhanced commitment to protect the natural and cultural heritage areas. Natural attractions such as mountains, lakes, beaches and the unique flora and fauna are the main reasons why tourists visit an area; therefore, product development shall focus on these attractions, supplemented subsequently by services and activities that will enhance visitor satisfaction. Trekking, bird watching, whale and dolphin watching, diving, and other outdoor recreational activities are some examples of experience-based products that can be developed.

## 6. Ecotourism Operation

Ecotourism operations may be community-managed, LGU, or commercial tours operated within an ecotourism site.

## 7. Community Participation

Community participation is considered significant in the management of an ecotourism site. Community participation encourages economic equity and active involvement in the utilization

and protection of the natural resources. It is important to mainstream gender equity in ecotourism activities and women's groups should play a key role in community participation.

## 8. Skills and Training of Local Communities

Successful community-based ecotourism programs involve a number of capacity building and enhancement. Enough and appropriate training programs should be included in the management and development of an ecotourism site.

## 9. Markets and Marketing

Present and projected visitors will help define the magnitude of development of an ecotourism site. There must be an effort to determine the sources, types, and preferences of the existing and potential visitors to the site to develop the right types of facilities.

## 10. Site Management

The success and sustainability of ecotourism development is highly dependent on management and an entity mandated to look after the site. The entity should be able to monitor and manage ecotourism businesses within the area, look after the well-being, safety and satisfaction of the visitors, and ensure that impacts are prevented or mitigated.

## 11. Visitor Management

Uncontrolled visitors may create negative impacts to the ecotourism site. Visitor management should include flow management (movement), being well informed through the use of signage and doing the proper behavior while inside the ecotourism site.

## 12. Partnership

Any tourism site would be hard to manage without active partnership with other entities with similar objectives or mandates to protect the ecotourism site and promote ecotourism. Identify these organizations and seek out active partnership or collaboration for ecotourism programs.

## 2. ECOTOURISM PLANNING

The data collected in the Site Assessment phase and the corresponding recommendations shall be the inputs to the formulation of the Ecotourism Management Plan. For protected areas, a major requisite in this phase is the Protected Area Management Plan, which is the basis for ecotourism planning.

## A. Major Elements of the Ecotourism Management Plan

The Ecotourism Planning and Management process shall serve as the basis in the actual physical and program development of ecotourism in the protected area. The major elements of the Ecotourism Management Plan shall include the following:

### 1. Site Profile

Site profile would include general information on the destination that will help the stakeholders come up with appropriate plans and programs.

### 2. Tourism Situation

This serves as the tourism situationer in the area and helps determine the level of development that can still be introduced in the site. This includes the present number of tourist facilities (e.g. hotels, inns, homestay), and the tourist statistics in the site. Also included are tourist movement and a study on how the natural resources are currently impacted by tourism.

### 3. Issues and Concerns to Developing and Sustaining Ecotourism

Developing ecotourism may encounter various challenges that will have to be recognized and properly addressed. These include environmental, social, financial, and institutional issues.

### 4. Ecotourism Planning for the Site

This takes into consideration all the possible and appropriate development for the ecotourism site. Identified ecotourism products are developed and detailed physical development is formulated.

### 5. Vision, Goals and Objectives

The Vision Statement will help others to understand what is to be achieved. A clearly defined vision will guide the work ahead. Goals and objectives should be derived from the more general goals and objectives of the Protected Area Management Plan.

## B. Component Strategies

The component strategies for the Ecotourism Management Plan consist of: 1) Zoning for Visitor Use; 2) Visitor Site Planning and Design; 3) Sustainable Infrastructure Design; 4) Visitor Management; and 5) Revenue generation.

### 1. Zoning for Visitor Use

Zoning is the division of the area into different zones for the purpose of distributing different types of use or non-use in the most appropriate places (Drumm et al). The number and types of zones depend on the following:

a. Management objectives and priorities of the site
b. Quality and variety of the natural and cultural resources and the degree of alteration they have suffered
c. Types of use that have been planned

Each zone shall be managed to maintain a particular natural setting within which ecotourism and other activities take place, and each zone has its own set of rules and regulation for activities carried out within its boundaries.

Planning for ecotourism activities should consider the types of visitors that usually visit the protected area. Although in general, the protected area caters to all types of visitors and the facilities in the area are geared towards basic visitor demands. However, ecotourism activities in the protected area should be low impact and well managed. Usually, protected areas have a zone dedicated for public use - this is the multiple use zone.

Steps in zoning the protected area are the following:

i. The first step is to determine areas suitable for ecotourism within the multiple use zone of protected areas. Examples of sub zones could be: administration area, parking area, camping sites, viewing areas, etc.
ii. On a base map of the protected area, locate the specific ecotourism attractions and infrastructure, as well as those sensitive and fragile areas. Indicate where the trails, viewing areas, camping sites, visitor center, guard stations, eco-lodges are supposed to be located. Avoid locating these ecotourism activities in sensitive and fragile areas and geologically hazardous areas; there should be a considerable distance from them.
iii. Verify the locations by actual site visits.
iv. Prepare a preliminary zoning map, indicating the recommendations for visitor use. Consider the flow of visitors given the proposed zoning map.
v. Finalize the zoning map by describing each zone according to the "zone attributes."
    a. Biophysical attributes: what are the biophysical limitations/ sensitivities?
    b. Social attributes: what are the visitor group sizes, number of groups per day, types of use permitted in the zone?
    c. Administrative attributes: what levels of protection and management in each zone, and the rules and management actions?
vi. The zones should be finalized on the map with the following:
    a. Name of zone: which describes the type of activity permitted in the zone
    b. General objective: what sort of ecotourism experience is provided in the zone
    c. Zone description: a summary of the biophysical, social and administrative attributes
    d. Zone boundaries: describe the locations of the zone, giving precise boundaries
vii. Formulate the management rules, regulations and policies for these zones. These must be communicated to the visitors as rules for visitors. Define the rules and regulations that will apply to the specific visitor sites and zones.

The result of the zoning shall be the basis for selecting and designating Tourism Enterprise Zones (TEZs) as provided for in the Tourism Act.

## 2. Visitor Site Planning

Visitor use should be concentrated in only a few locations of the protected area, usually called visitor sites. This is to facilitate management, and limit the impact on the natural environment. It is important that these "visitor sites" be well planned.

After zoning for an area has been established, site plans should be prepared. It is best to involve landscape architects for the task.

Good visitor site planning should aim for:

a. Efficient use of space by locating infrastructure in places where it will be most easily, safely and effectively used by visitors, protected area employees and site managers.
b. Minimal impact on the surrounding environment
c. Planning infrastructure in accordance with the determined capacity of the protected area to receive a definite number of visitors.

Site planning requires the preparation of an actual plan and topographic map on which all existing planned ecotourism infrastructure is placed, such as eco-lodges, trails, campsite, visitor center, or toilet facilities. Site planning will require the services of professional landscape architect and other specialists.

SITE DEVELOPMENT PROCESS:

i. Review of the Protected Area Management Plan
ii. Establishment of the boundaries of the site
iii. Conduct of topographic survey
iv. Locating significant features (vegetation, rivers, structures, etc.) on the topographic map.
v. Investigation of soil conditions and bearing capacities for buildings

SPECIFIC CONSIDERATIONS IN SITE PLANNING SHOULD INCLUDE:

i. Capacity: determine limits based on site sensitivity
ii. Density: limits for development and human activity

iii. Slopes: steep slopes should be avoided
iv. Vegetation: retain as much native vegetation to secure the integrity of the site. Avoid landscaping, use of exotic species, use of lawns
v. Wildlife should not be disturbed or threatened especially nesting sites
vi. Views should be maximized, buildings blend with views
vii. Natural hazards: development should avoid areas with natural hazards
viii. Energy and utilities: natural lighting and ventilation, use of environmentally appropriate waste technologies
ix. Safe and efficient use of water resources, including rainwater, through the use of rainwater catchments).
x. Visitor circulation systems (lodging and trails should optimize visitor movement, minimum disturbance to sensitive areas and wildlife corridors, low impact).

## 3. Sustainable Infrastructure Design

Infrastructure in protected areas should blend with the surroundings. Once the site plan is complete, next is the design of infrastructure such as trails, campgrounds, eco-lodges, and other support systems. This is a job that should be entrusted to a licensed architect who understands the importance of harmonizing design with ecological processes and natural beauty.

Overall building design philosophy should be: Sustainable design minimizes environmental impacts, use of non-natural materials, and the production of waste. Development should be done with use of natural materials, use of renewable energy, and proper management of waste.

The ecotourism standards issued by NEDC/NESC for eco-facilities and eco-lodges and DAO 2009-09 (Standard Designs and Specifications of Signs, Facilities and Other Infrastructure that may be Installed and/or Constructed within Protected Areas) should be followed.

## 4. Visitor Management

A. Strategies for visitor management include the following:

1. Reduction of area by:
    a. Limiting number of visitors to entire area
    b. Limiting length of stay
    c. Encouraging use of other areas
    d. Requiring certain skills or equipment
    e. Charging higher visitor fee
    f. Making access more difficult

2. Reduction of problem areas by:
    a. Informing visitors of constraints in area and discourage use of area
    b. Limiting number of visitors
    c. Making it more difficult to go there
    d. Eliminating facilities
    e. Establishing skills and equipment requirements
    f. Charging different visitors fees

3. Modification of location of use within problem areas by:
    a. Discouraging camping or use
    b. Encouraging camping only at certain areas
    c. Locating facilities in non-problematic sites
    d. Concentrating use on sites through facility design
    e. Discouraging off-trail travel
    f. Segregating types of visitors

4. Modification of timing of use by:
    a. Encouraging use outside of peak periods
    b. Discouraging use when potential impact is high
    c. Charging fees during periods of high use or impact potential

5. Modification of type of use and visitor behavior by:
    a. Discouraging/prohibiting damaging practices and behavior
    b. Teaching correct ecotourism ethics
    c. Requiring certain group size
    d. Requiring use of guide
    e. Discouraging use of animal transport
    f. Discouraging radios and noisy equipment
    g. Prohibiting pets
    h. Discouraging overnight use

6. Modification of visitor expectation by:
    a. Informing about appropriate uses
    b. Informing about conditions to expect

7. Increasing the resistance of the resource
    a. Using fences and natural barriers
    b. Strengthening the site (tent platforms, paved trails, etc.)

B. Methods of visitor management can be direct and indirect.

1. Direct methods include:
    a. Environmental education/interpretation
    b. Information
    c. Site management
    d. Zoning
    e. Infrastructure and facility design
    f. Maintenance
    g. Ease or difficulty of access

2. Indirect methods include:
    a. Fees and costs
    b. Restrictions

c. Patrolling
d. Requirement of certain skills
e. Permits and licenses
f. Designation of sites
g. Trained guides
h. Rules and regulations

## 5. Revenue Generation

Mechanisms for generating revenue include: entrance fees, user fees, licenses and permits, sales and concessions. Determining fees in protected areas shall be in accordance with DAO No. 2000-51 (Guidelines and Principles in Determining Fees for Access to and Sustainable Use of Resources in Protected Areas), and corresponding Manual for the Implementation of the Fee System Guidelines in Protected Areas.

a. Entrance fees are collected for entrance to the protected area.
b. User fees are exacted for use of specific facilities such as cottages, picnic tables, parking, camping, etc.
c. Licenses and permits are charged to tour operators to allow them to manage visitors in the protected area.
d. Sales involve third parties or the protected area administration that may sell souvenirs, food and other products in the protected area. For third parties, a percentage should be collected by the protected area administration, as determined and agreed in the contract.
e. Concessions are available to third parties intending to provide services to visitors in the site such as: lodging, food services, guided tours, boat or other transportation, etc. Selection of third party concessionaires shall be carried out through a bidding process following government rules and regulations.

## C. Formulation of the Ecotourism Management Plan

The formulation of the Ecotourism Management Plan should be consistent with the existing Protected Area Management Plan and in accordance with the following outline. Planning for the ecotourism development and management of an area shall be participatory, involving all concerned stakeholders including women's groups.

### ECOTOURISM MANAGEMENT PLAN OUTLINE

| |
|---|
| **I. Existing Situation** |
| 1. Area Physical Profile |
| 2. Location / Area |
| 3. Climate |
| 4. Geological Characteristics |
| 5. Demography |
| 6. Existing Infrastructure |
| 7. Utilities |
| 8. Transportation |
| **II. Tourism Profile** |
| 1. Natural Resource Base |
| a. Natural ecosystems (forests, caves, mangroves, rivers, etc.) |
| b. Attractions (scenic areas, waterfalls, etc.) |
| c. Natural Resources (flora and fauna; water resources, etc.) |

| |
|---|
| 2. Cultural Resource Base |
| a. Cultural, historical, archaeological sites |
| b. Festivals and Events |
| c. Indigenous/ ethnic cultures |
| 3. Market Analysis |
| a. International Tourist Arrivals |
| b. International Visitor Profile (DOT statistics) |
| c. Domestic Tourism Segments |
| • Families |
| • Students |
| d. International Tourism Segments |
| • Balikbayan |
| • Package Tours |
| • Free and Independent Tourists (FIT) |
| • Scuba Diving |
| e. Other special interest travelers |
| 4. Tourism Marketing |
| a. Government marketing |
| b. Private sector marketing |
| c. Ecotourism marketing |
| 5. Transport |
| a. Air |
| b. Water |
| c. Land |

| |
|---|
| 6. Accommodation |
| 7. Tourism Services |
| a. Facilities |
| b. Support services |
| c. Utilities |
| d. Communication |
| e. General tourist information |
| f. Rescue and medical services |
| g. Security |
| 8. Human Resources Development |
| a. Employment by sector |
| b. Training needs |
| c. Training available |
| 9. Issues / impacts |
| a. Environmental |
| b. Social |
| c. Economic |
| d. Institutional |
| **III. Plan** |
| 1. Vision |
| 2. Goals and Objectives |
| 3. Strategies / Programs / Projects |
| 4. Site Plan and Zoning |
| 5. Visitor Management Plan |

| |
|---|
| 6. Site Activity Management |
| 7. Opportunities for Ecotourism (including business) |
| 8. Capacity Building |
| 9. Marketing and Promotion |
| 10. Institutional Arrangements |
| 11. Action Plan |
| 12. Monitoring and Evaluation |

# ANNEX C
# BUSINESS PLANNING PROCESS

## SELECTING TYPES OF ECOTOURISM ENTERPRISES

The general process of business planning includes:

1. Community-based ecotourism enterprises
2. Private sector concessions (tour operators, accommodations, food, etc.)
3. NGO/Private sector partnership
4. NGO ecotourism enterprises
5. NGO/community/private sector partnership
6. LGU/community partnership
7. Others including women's groups, indigenous peoples, out-of-school-youth, etc.

## BUSINESS PLAN PREPARATION

The Ecotourism Business Plan should include, but will not be limited, by the following outline:

1. EXECUTIVE SUMMARY, which contains the highlights of the business plan.
2. PRODUCT OR SERVICES DESCRIPTION, which contains the details of the services or products offered, and the Mission Statement for the business.
3. INDUSTRY ANALYSIS, which is an assessment of the standards, trends, and characteristics of the ecotourism industry in the area.
4. MARKETING STRATEGY, a description of target markets, estimation of market size, and number of visitors expected, including details of promotional and sales activities.
5. MANAGEMENT AND ORGANIZATION, which is an overview of business structure, including key positions and descriptions.
6. FINANCIAL PROJECTIONS to reflect historical, current, and projected financial data.
7. MONITORING AND EVALUATION, which will include indicators and method of monitoring.

# IN THIS SEGMENT

GENDER ANALYSIS TOOL FOR ECOTOURISM ENTERPRISE DEVELOPMENT

# Gender Analysis Tool for Ecotourism Enterprise Development

The Gender Analysis (GA) Tool for Ecotourism Enterprise Development is divided into three parts: preliminary activities, implementation of the ecotourism enterprise, and monitoring and evaluation (M&E). The tool is composed of 32 questions with corresponding points.

The points given to a specific question depend on the level of compliance to what's required by or whether the response to the question is a negative or a positive. If the response to a question is NO, the score is 1; if the response is PARTLY YES, the score is 2; and if the response is YES, the score is 3 or 4, as the case may be. The maximum point is indicated in every item. To get the total gender and development (GAD) rating, add all the scores. The maximum total score is 100 points.

Based on the total points, a program or project may be classified as "GAD is absent," "with potential to be gender sensitive," "gender sensitive," or "gender responsive." A column for Remarks–Results or Comments is included to justify the points given, if needed.

| SCORES AND INTERPRETATION | |
|---|---|
| **0-50** | GAD is absent |
| **51-67** | With potential to be gender sensitive |
| **68-84** | Gender sensitive |
| **85-100** | Gender responsive |

Projects or programs classified as "GAD is absent" and "with potential to be gender sensitive" shall be provided with more capacity building and other forms of assistance. "Gender sensitive"

and "Gender responsive" projects will be linked with financial institutions and other networks for sustainability. Furthermore, proponents who are "Gender responsive" shall be included in the pool of experts to serve as resource person, coach, or technical adviser for other ecotourism sites.

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| **I. Preliminary Activities: Preliminary Site Evaluation (PSE), Full Site Assessment (FSA), Site Validation, Basic Ecotourism Training, and Business Planning** | | | | | | |
| 1. | Do the objectives of the ecotourism project explicitly refer to women and men? (Possible scores: 1, 2, 3) | | | | | |
| 2. | Have target groups and others who are affected directly or indirectly by the ecotourism project identified their own needs/priorities for environmental management, resource use, and conservation? (Possible scores: 1, 2, 3) | | | | | |
| 3. | Have women and men been included in the preliminary activities (e.g. preliminary site evaluation, full site diagnostic and site validation, basic ecotourism training, business planning)? (Possible scores: 1, 2, 3) | | | | | |
| | If yes, what is their participation in the preliminary activities? | | | | | |
| | a. Women and men attend consultations and planning sessions. | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| | b. Women and men attend and actively participat in the preliminary activities (e.g., provided background information/history of the area, participated as researchers and enumerators in surveys, participated in biodiversity surveys and assessments; if in a coastal area, participated as key informants in the research, etc.) | | | | | |
| 4. | Have women been supported to engage in the research and documentation of environmental issues and ecotourism enterprise development activities (e.g., PSE, FSA, site validation, ecotourism training, and business planning)? (Possible scores: 1, 2, 3) | | | | | |
| | If not, how are their views, inputs, needs, and concerns considered in the studies and consultations? (Example: potential of the area/product as an alternative livelihood option, environmental protection measures, management of tourists, etc.) | | | | | |
| | Other possible needs/concerns that could be raised are: (a) change in current livelihood/daily activities; (b) alteration of the natural environment; (c) competition; and (d) success of the ecotourism industry in the area. | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| 5. | Has the ecotourism project tapped sex-disaggregated data and gender-related information (e.g., PSE, FSA, site validation, ecotourism training, and business planning)? (Possible scores: 1, 2, 3) | | | | | |
| **II. Enterprise Development in Ecotourism Areas** | | | | | | |
| 1. | Have the target groups identified their own finance and enterprise development needs? (Possible scores: 1, 2, 3) | | | | | |
| 2. | Do women and men have adequate and equal access to the proposed compensation from the ecotourism project? (Possible scores: 1, 2, 3) | | | | | |
| 3. | Are there available gender-sensitive and gender-responsive ecotourism guides? (Possible scores: 1, 2, 3) | | | | | |
| 4. | Are the communication channels for the project equally accessible to women and men? (Possible scores 1, 2, 3) | | | | | |
| 5. | Do women and men currently have other sources of household income? (Possible scores: 1, 2, 3) | | | | | |
| 6. | Have the ecotourism activities assisted women in their daily and/or seasonal tasks (e.g., by relieving their workload)? (Possible scores: 1, 2, 3) | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| 7. | Have the constraints to women's and men's participation in the activities been identified? (Possible scores: 1, 2, 3) | | | | | |
| 8. | Have strategies been identified to overcome these constraints? (Possible scores: 1, 2, 3) | | | | | |
| 9. | Have women been consulted and involved in the decision making, such as changes to the use and management, of the natural resources? (Possible scores: 1, 2, 3) | | | | | |
| 10. | Have opportunities (economic and others) for participation or support for the ecotourism project been identified, and can women and men access these? (Possible scores: 1, 2, 3) | | | | | |
| | > Identify/enumerate the non-traditional livelihood opportunities for women | | | | | |
| | Examples:<br>• Direct operations of the project (e.g., tour guides)<br>• Support enterprises, such as catering, lodging, souvenir shops, etc.<br>• As marshals or as part of environmental watch groups<br>• As community organizers and mobilizers<br>• As members of organizations | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| | • Women and men learn about relevant environmental laws/policies and technologies on ecotourism development<br>• Women and men actively participate as marshals (e.g., Bantay Dagat, members of local environmental organizations or PAMB, etc.)<br>• Women actively advocate for the protection and proper management of natural resources | | | | | |
| 11. | Are there measures taken to support, ensure, and enhance the participation of women and men, and/or enhance opportunities for women to participate in economic opportunities and project operations? (Possible scores: 1, 2, 3) | | | | | |
| | > Training needs of men and women assessed<br>> Training identified and conducted (e.g., for direct operations, enterprise/ livelihood, as tour guides and marshals for environmental protection)<br>> No. of women and men participating by type of training | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| | > Women are given opportunity to undergo training, such as:<br>• literacy and numeracy<br>• business planning<br>• savings and loan management skills<br>• tour guiding<br>• catering<br>• species identification<br>• business planning and counseling<br>• first aid and safety<br>• environmental protection and management<br>• book keeping<br>• financial management<br>• basic ecotourism course<br>• arts and crafts<br>• flora and fauna assessment | | | | | |
| | > Number of women trained | | | | | |
| | > Is personal safety equipment provided? | | | | | |
| | > Are health and safety insurance and other social protection measures provided? | | | | | |
| | > Is facilitation and brokering for access to resources present? (e.g., assistance from government and other institutions on microfinance, tourism promotion, development of culinary skills, and arts and crafts, etc.) | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| | > In the course of the project's direct operations, are measures provided to safeguard women from exploitation (e.g., sexual harassment, prostitution, and trafficking)? Are these measures implemented properly? If yes, what are these? If no, why? | | | | | |
| | > Are there laws and ordinances being implemented? If yes, what are these? If no, why? | | | | | |
| 12. | Do the women and men apply or use the institutional support provided? (Possible scores: 1, 2, 3) | | | | | |
| | > No. of women and men employed by the project's direct operations<br>> What are their participation in the project?<br>> Are women given non-traditional roles (e.g., as tour/dive guides, spotters, boat operators, etc.)? | | | | | |
| | > No. and type of enterprises identified/ enumerated<br>> Are women able to avail loans/grants to start up or upscale their enterprises?<br>> What enterprises have been established through these loans/grant? | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| 13. | Have women's traditional knowledge and practices been integrated into the environmental management practices initiated by the ecotourism project? (Possible scores: 1, 2, 3) | | | | | |
| 14. | Has disaggregated data been collected on the role of women in the informal sector and/or as entrepreneurs? (Possible scores: 1, 2, 3) | | | | | |
| **III. Monitoring & Evaluation: Tracking Outputs and Outcomes** | | | | | | |
| 1. | Are there lessons learned in the development outcome of the current ecotourism project site (e.g., parameters to be observed, considerations, etc.)? Are these lessons applicable in the development of future ecotourism areas? (Possible scores: 1, 2, 4) | | | | | |
| 2. | Has the enterprise been able to return at least 2% of its earning to the seed capital after three years of the project's implementation? (Possible scores: 1, 2, 4) | | | | | |
| 3. | Have the targets for men's and women's participation and benefits been met? (Possible scores; 1, 2, 4) | | | | | |
| 4. | Have women emerged as champions for the ecotourism enterprise? (Possible scores: 1, 2, 4) | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| 5. | Are there models for gender-sensitive ecotourism enterprise development and management that can be replicated in other sites? (Possible scores: 1, 2, 3) | | | | | |
| 6. | Are there mechanisms to track the contribution of women and men in the project? (Possible scores; 1, 2, 3) | | | | | |
| | Examples:<br>> Enterprise support: (a) income for the family; (b) contribution to revenues of the local government; (c) increase in household income in the community and contributions to the local government; and (d) increase in number of visitors<br>> As staff officer in the direct operations of the project (e.g., as guides): (a) efficiency and (b) effectiveness<br>> As a marshall/concerned citizen: (a) maintenance of the ecotourism site; (b) overall environment sustainability of the locality; and (c) no. of men and women involved in Bantay Dagat, coastal celan-up, environmental advocacy, environmental protection and management, etc.<br>> As members of organizations, cooperatives, etc. | | | | | |

| Guide Questions | | Points | | | Remarks | |
|---|---|---|---|---|---|---|
| | | Response | | | Score for item | Result or Comment |
| Element and Guide Question | | No | Partly Yes | Yes | | |
| 7. | Has the project planned to increase the capacity for gender-sensitive environmental planning and management, up to implementation? (Possible scores: 1, 2, 3) | | | | | |
| 8. | Have gender-sensitive indicators been identified? (Possible scores: 1, 2, 3) | | | | | |
| 9. | Have the needs of women (practical and strategic) been addressed by the project? (Possible scores: 1, 2, 3) | | | | | |
| 10. | Has the project identified risks of domestic violence that could result from women earning and controlling the household income? (Possible scores: 1, 2, 3) | | | | | |
| 11. | Are the collected monitoring data disaggregated by sex? (Possible scores: 1, 2, 3) | | | | | |
| 12. | Is there ongoing consultation with community groups, including women's groups, who are directly or indirectly affected by the project? (Possible scores: 1, 2, 3) | | | | | |
| 13. | Has the project's monitoring activities tapped sex-disaggregated data and gender-related information? (Possible scores: 1, 2, 3) | | | | | |

# IN THIS SEGMENT



# Carrying Capacity: A Manual for Ecotourism Planning and Development

## PREFACE

This manual focuses on computing carrying capacity (CARCAP), also known as the allowable number of visitors and tourists, for ecotourism sites in Protected Areas (PA). Two simple and easy-to-apply models were utilized (a) the Boullon's CARCAP mathematical model, and (b) the Limits of Acceptable Change (LAC). There are many other ways to compute CARCAP for different intent and purposes (social, physical, ecological, among others), and they can be undertaken simultaneously or separately, or successively, depending on the need of a site.

This manual therefore will help guide in planning and developing an ecotourism project, particularly in formulating an ecotourism management plan. This will serve as an important input in the design of visitor management scheme, specifically in the context of knowing how many visitors or tourists can be allowed to do particular activities in a site.

To make this manual more effective and useful, several reminders must be considered by the readers and would-be users:

- FORMAL TRAINING ON TOURISM CARRYING CAPACITY is necessary before applying this guideline on-site. It is of utmost importance that the specific methods and approaches be fully understood and well appreciated. For instance, in determining the STANDARD requirements of visitors and in identifying the LIMITING FACTORS, a more exhaustive and in-depth analysis must be undertaken. If possible, the factors should include all those that influence the use of a particular area (or space), activities, and services in an ecotourism

destination. More importantly, consideration should be given to ENVIRONMENTAL FACTORS like, for instance, the area designated as habitat of biodiversity-significant species, mating season of Philippine eagle, nesting area of marine turtle, spawning grounds of maliputo (an endangered species in Taal Volcano Protected Landscape), and many others. These factors should be incorporated in the mathematical computation of CARCAP.

- The computation of CARCAP should be a continuing process. Standard requirements and limiting factors, as well as products, services, and activities in ecotourism sites CHANGE every now and then. They are not constant. Hence, re-computing CARCAP is a must once any change in any of the above conditions occur.

- All of the mentioned CARCAP models, as well as related methods and approaches, mentioned in this manual can be learned and mastered only after real-life application and continuous practice. The methods and procedures cannot be learned overnight; it requires thorough understanding, appreciation, and commitment.

- Related studies should be undertaken to support or augment the CARCAP set for an ecotourism site. For instance, for a defined number of snorkelers allowed to snorkel simultaneously in a coral area, an example of an accompanying research would be determining the impact or level of disturbance brought about by their presence. Knowledge of this will certainly help adjust or support the CARCAP set.

Hopefully, through this manual, readers and end-users will be encouraged further to engage in biodiversity conservation and PA management.

## HOW IMPORTANT IS CARRYING CAPACITY?

The concept called "carrying capacity" has received considerable attention due to increasing pressure on our natural environments. The environment can only take so much because it has its limitations. The moment we exceed this threshold, devastation and destruction occur. As a planning tool, CARCAP is important for many tourism areas, especially with recent threats of anthropogenic interventions, biodiversity loss, and climate change. CARCAP can help lower or make tolerable

these impacts to the natural resources. One should determine the tourism capacity of a certain site to make its operation sustainable and lasting. Aside from providing a steady source of income to local community, CARCAP also helps ensure high levels of satisfaction for visitors.

Some Philippine laws and policies, such as Executive Order No. 111 (Guidelines for Ecotourism Development in the Philippines) and Republic Act 9593 (Tourism Act of 2009), are geared towards this end. Furthermore, the Philippine government recognizes sustainable tourism as an integral element in socio-economic development, as well as to improve the quality of life of the Filipino people and promote a tourism industry that is ecologically sustainable, responsible, participative, culturally sensitive, economically viable, and ethically and socially equitable.

## WHAT IS THE PURPOSE OF THE MANUAL?

The objective of this manual is to provide understanding on the basic concepts and principles of CARCAP as it relates to ecotourism planning and development. Next, this manual also aims to provide guidance in CARCAP computation, particularly in:

- Determining how standard requirement of tourists and visitors in a particular ecotourism site is estimated; and
- Identifying the different limiting factors that may influence the carrying capacity of said ecotourism sites.

## WHAT ARE THE BASIC PRINCIPLES AND DEFINITION OF CARRYING CAPACITY?

We highlight eight main points on CARCAP:

- In its broadest sense, CARCAP refers to the ability of a system to support an activity or feature at a given level.

- CARCAP depends on three main factors: (1) the amount of resources available in the ecosystem; (2) the size of the population or the number of users; and (3) the amount of resources each individual consumes.

- CARCAP is influenced by many factors (social, psychological, economic, environmental, among others), and these factors normally limit the level of carrying capacity of a certain area.

- CARCAP is also seen as "equilibrium" or "balance." However, the carrying capacity for many species constantly changes due to various factors.

- Different organisms have different carrying capacities in the same area. Thus, an ecosystem's CARCAP affects everything that lives in it.

- The populations of most living things tend to fluctuate naturally around a certain level, which is also perceived as CARCAP.

- CARCAP has many variances (M. MacLeod and J.A.G. Cooper):

  (1) PHYSICAL CARRYING CAPACITY: the spatial limitations of an area and is often expressed as the number of units that an area can physically accommodate (e.g., allowable number of establishments in Boracay).

  (2) ECOLOGICAL CARRYING CAPACITY: a measure of the population that an ecosystem can sustain, defined by the population density beyond which the mortality rate for the species becomes greater than the birth rate. In a recreational context, ecological carrying capacity can also be defined as the stress that an ecosystem can withstand (i.e., changing visitor numbers or activities) before its ecological value is unacceptably affected.

  (3) SOCIAL CARRYING CAPACITY: essentially a measure of crowding tolerance, and which has also been defined as "the maximum visitor density at which recreationists still feel comfortable and uncrowded" (De Ruyck et al., 1997).

  (4) ECONOMIC CARRYING CAPACITY: the extent to which an area can be altered before the economic activities occurring in the area are affected adversely. It therefore attempts to measure changes in economic terms (Rees, 1992).

- In the context of ecotourism development (i.e., the focus of this manual), CARCAP refers to the maximum number of individuals or visitors that can be accommodated in an ecotourism site without affecting the state of the environment, the level of satisfaction of the visitors, and the sociocultural norms of the local community.

## HOW DOES ONE COMPUTE CARRYING CAPACITY?

There are many ways to compute carrying capacity. For tourism purposes, two simple and easy-to-understand models are presented in this manual:

- Boullon's (1985) Carrying Capacity Mathematical Model (BCCMM)
- Limits of Acceptable Change (LAC)

Either one (or both simultaneously) may be used depending on (1) the condition of the ecotourism site, (2) the tourism activities and services offered, and (3) the purpose for which CARCAP is applied. Sample exercises are provided in Annexes A, B, and C.

### 1. Boullon's Carrying Capacity Mathematical Model

In BCCMM, the challenge is on how to determine the STANDARD REQUIREMENT of the visitor.

Standards may come in the form of time, space, material, psychological, ecological, and other needs of the visitor (i.e., how much area is needed for swimming, snorkeling, diving, which can be expressed in sq. m.). Standards can also be derived from secondary literature, such as from the publications of World Tourism Organization, which reported that the standard space requirements in beach areas are:

- 1.7 sq. m./person in the Netherlands
- 3.0 sq. m./person in Spanish resorts
- 30.0 sq. m./person in tropics

Another approach in determining the standard is through visitor survey (e.g., personal interviews). Template 1 suggests some parameters. Sample interview schedules are provided in Annexes D and E.

**TEMPLATE 1. QUESTIONNAIRE ON CARCAP STANDARDS FOR PERSONAL INTERVIEWS**

| Psychological Considerations | Economic Considerations | Sociocultural Considerations |
|---|---|---|
| • Visitation with a group or as an individual?<br>• Reason/s for coming to the ecotourism site and type of visit (hard or soft tourism)<br>• Recreational activities preferred<br>• Facilities requirements<br>• Equipment brought to the site<br>• Parking requirements for car, bus, etc. | • Daily or monthly income<br>• Daily or monthly expenditure (food, clothing, education, health, etc.)<br>• Specific amount allocated for recreational/tourism activities<br>• Primary and secondary sources of income<br>• General socioeconomic status in life (rich, poor, or middle income?) | • Demographic profile (age, sex, educational attainment, religion, ethnic group, etc.)<br>• No. of family members or household size<br>• Profession/occupation<br>• Organizational affiliation<br>• Beliefs and practices relative to tourism activities |

Once the standard is set and other relevant data and information are generated, then CARCAP computation may proceed.

- First level: Basic Carrying Capacity (BCC) is calculated by dividing the total size of a particular area used by the visitors with the average or standard size/space requirement of visitors.
- Second level: Potential Carrying Capacity (PCC) is calculated by computing first the rotation coefficient (RC) of specific tourism activity.
- Third level: Real Carrying Capacity (RCC) is the maximum permissible number of use of an area once the limiting factors ($Lf_1$,$Lf_2$,...$Lf_n$) (i.e., reductive) derived from the particular characteristics of the site or the standards/needs of the visitors are applied. RCC is computed by incorporating the limiting factors identified during the interviews and observations in the sites.

## 2. Limit of Acceptable Change (LAC)

The figure below shows the nine steps involved in the application of LAC process (Stankey, et. al. 1985).


STEP 1. Identify area concerns and issues. In addition to legal guidelines and organizational policy, management of an area needs to reflect area-specific features and values in order that the role of the area at both regional and national levels can be assessed.

STEP 2. Define and describe opportunity classes. These represent sub-units of the area where different conditions are provided, thereby increasing the diversity of the area.

STEP 3. Select indicators of resource and social conditions that can be quantitatively measured.

STEP 4. Inventory resource and social conditions. These data should be recorded and mapped.

STEP 5. Specify standards for each indicator in each opportunity class. This helps ensure realism and also clarifies the nature and extent of management activity that will be required to achieve standards.

STEP 6. Identify alternative allocations of the area among the various opportunity classes, as different allocations require different types of management.

STEP 7. Identify actions for each alternative. This requires an analysis of the various costs and benefits of each alternative, in terms of environmental impacts and impacts on visitors as well as administrative costs.

STEP 8. Evaluate and select an alternative. The final selection will reflect the responsiveness of the alternative to the issues and concerns identified in Step 1 and the management requirements identified in Step 7.

STEP 9. Implement selected alternative and establish a monitoring program. Monitoring is particularly important as it provides feedback on the effectiveness of the management actions employed, alerting managers to the need to consider more rigorous application or the use of other measures

## HOW CAN AN ECOTOURISM SITE INCREASE ITS CARRYING CAPACITY?

Some general strategies that can be applied in increasing the carrying capacity of an ecotourism site are as follows:

- Re-design facilities (view decks, tracks, trails, etc.) to accommodate more visitors/activities. For instance, you may increase the number of view decks, tracks, or trails. However, in doing so, environmental considerations should be looked into, such as if these will increase impact to habitat of important biodiversity species.
- Increase durability of heavily used resources (pavilion area, camping area, parking area, playground, etc.). Is there a need to add new parking space or even widen the camp sites? If so, the number of visitors can also be increased.
- Improve access to other sites of interests. One possible way is by installing covered walks so that even during hot and rainy seasons, access to an area is not denied. Hence, the number of visitors coming to the site is not affected drastically.
- Introduce additional recreational activities to distribute visitation or concentration in an area, such in the case of the Puerto Princesa Subterranean River where visitors line up/ wait for their turn to take the river cruise. Short environmental films can be shown to make them busy. They are also directed to see the centuries-old mangrove forest in a nearby community. Such activities can be packaged as alternatives.

# ANNEXES A TO C

## Exercise No. 1: Carrying Capacity in Protected Areas (Matabungkay, Batangas)

## Exercise No. 2: Carrying Capacity of a Small Island (Siargao Island)

## Exercise No. 3: Carrying Capacity in Protected Areas (Pamilacan Island)

**Exercise No. 1**
**Carrying Capacity in Protected Areas**

1. Compute the number of swimmers that can be allowed in the beach of Matabungkay in Batangas given the following:

   - Size of swimming area = 10 hectares
   - Standard area requirement per swimmer = 200 sq. m.
   - Beach open 24 hours / day
   - Average no. of hours of swimming per swimmer = 6 hours
   - Summer months ideal for swimming = January to May
   - Excessive sunshine during summer months = 10 am to 3 pm
   - Excessive wind of about 10 weeks in a year
   - Excessive mud in June due to heavy rain
   - Closure period of two weeks for maintenance work in a year
   - Breeding of dugongs and other marine mammals = August to October

2. Compute also the Potential Carrying Capacity and the Real Carrying Capacity

3. What management strategies could be applied to increase the number of visitors that can be allowed in the beach area?

*Exercise 1: Matabungkay Case*

**Answers to Exercise No. 2**
**Carrying Capacity in Protected Areas**

1.

$$CC = \frac{10\ hectares}{200\ m^2}$$

$$= \frac{100{,}000\ m^2}{200\ m^2}$$

**= 500 swimmers per day**

2. PCC, Compute first the rotation coefficient (RC)

   a.

   $$RC = \frac{24\ hours}{6\ hours}$$

   **= 4 hours per day**

   b.

   $PCC = CC\ x\ RC$
   = 500 x 4
   = **2,000 swimmers per day**

3. RCC, compute first the limiting factors

   - Excessive sunshine (L*f*1)
     - five hours per day for 5 months (Jan-May)
     - 5 months x 30 days = 150 days

     M1 = 150 days x 5 hours
     = 750 hours of excessive sunshine

     Mt = 365 days per year x 24 hours
     = 8,760

     $$Lf_{1=} \frac{M1}{Mt}\ x\ 100$$

     $$Lf_{1=} \frac{750}{8{,}760}\ x\ 100$$

     **= 8.56% for excessive sunshine**

*Exercise 1: Matabungkay Case*

- Excessive wind (L*f*2)

  M1 = 10 weeks of excessive winds

  Mt = 52 weeks in a year

  $Lf_{2=} \frac{M1}{Mt} x\ 100$

  $Lf_{2=} \frac{10}{52} x\ 100$

  **= 19.23% for excessive wind**

- Excessive mud (L*f*3)

  M1 = 1 month (June) of excessive mud

  Mt = 12 months in a year

  $Lf_{3=} \frac{M1}{Mt} x\ 100$

  $Lf_{3=} \frac{1}{12} x\ 100$

  **= 8.33 % for excessive mud**

- Closure for maintenance (L*f*4)

  M1 = 2 weeks of maintenance work

  Mt = 52 weeks in a year

  $Lf_{4=} \frac{M1}{Mt} x\ 100$

  $Lf_{4=} \frac{2}{52} x\ 100$

  **= 3.85% for maintenance**

*Exercise 1: Matabungkay Case*

- Breeding season (Lf5)

  M1 = 3 months (Aug-Oct) of breeding

  Mt = 12 months in a year

  $Lf_{5=} \frac{M1}{Mt} x\ 100$

  $Lf_{5=} \frac{3}{12} x\ 100$

  **= 25.00% for breeding season**

$$RCC = 2{,}000\ x\ \frac{100 - 8.56}{100} x\ \frac{100 - 19.23}{100}\ x\ \frac{100 - 8.33}{100}\ x\ \frac{100 - 3.85}{100}\ x\ \frac{100 - 25}{100}$$

= 2, 000 (.9144 x .8077 x .9167 x .9615 x .75)
= 2,000 (.4882)
**= 976.44 swimmers per day**

*Exercise 1: Matabungkay Case*

**Exercise No. 2**
**Carrying Capacity of a Small Island**

1. Compute the number of surfers and spectators that can be accommodated in the surfing area of Siargao Island given the following:

For surfing

- Size of surfing area = 50 hectares
- Standard area requirement per surfer = 5,000 sq. m.
- Surfing area open for 12 hours per day only, from 6 am to 6 pm
- Surfing months are from September to November per year only
- Average no. of hours of surfing per surfer = 3 hours
- Small waves from 6 am to 8 am and 5 pm to 6 pm
- 10,000 sq. m. devoted for view deck
- On the average, there are 5 days typhoon every November of the year
- ¼ hectare of the area is allotted for surfers' station

For viewing

- Size of view area = 1 hectare
- Standard area requirement per viewer/spectator = 5 sq. m.
- View area open for 12 hours per day only, from 6 am to 6 pm
- Average no. of hours of viewing per spectator = 6 hours
- Intense sunlight from 12 noon to 3 pm making viewing unpleasant
- 10% of the view area occupied by food stalls and souvenir shops
- Only 15 CRs are available compared to the ideal requirement of 1 CR per 100 viewers

2. Compute also the Potential Carrying Capacity and the Real Carrying Capacity

3. What management strategies could be applied to increase the number of surfers and spectators that can be accommodated in the area?

*Exercise 2: Small Island Case*

**Answers to Exercise No. 2**
**Carrying Capacity in Small Island**

A. For surfers

1.

$$CC = \frac{50\ hectares}{5{,}000\ m^2}$$

$$= \frac{500{,}000\ m^2}{5{,}000\ m^2}$$

**= 100 surfers per day**

2. PCC, compute first the rotation coefficient (RC)

- $$RC = \frac{12\ hours}{3\ hours}$$

  **= 4 hours per day**

- $PCC = CC\ x\ RC$
  $= 100 \times 4$
  **= 400 surfers per day**

3. RCC, compute first the corrective factors

- Small waves (L*f*1)
  - 3 hours (6 am to 8 am and 5 pm to 6 pm)

  M1 = 3 hours per day
  Mt = 12 hours per day

  $$Lf_{1=} \frac{M1}{Mt}\ x\ 100$$

  $$Lf_{1=} \frac{3}{12}\ x\ 100$$

  **= 25%**

*Exercise 2: Small Island Case*

- View deck (L*f*2)

  M1 = 10,000 sq. m.
  Mt = 50 hectares or 500,000 sq. m.

  $$Lf_{2=} \frac{M1}{Mt} \; x \; 100$$

  $$Lf_{2=} \frac{10{,}000}{500{,}000} \; x \; 100$$

  **= 2%**

- Typhoon (L*f*3)

  M1 = 5 days in November
  Mt = 3 months (September to November) or 91 days

  $$Lf_{3=} \frac{M1}{Mt} \; x \; 100$$

  $$Lf_{3=} \frac{5}{91} \; x \; 100$$

  **= 5.495%**

- Surfer station (L*f*4)

  M1 = ¼ hectares for surfers station or 2,500 sq. m.
  Mt = 50 hectares or 500,000 sq. m.

  $$Lf_{4=} \frac{M1}{Mt} \; x \; 100$$

  $$Lf_{4=} \frac{2{,}500}{500{,}000} \; x \; 100$$

  **= 0.5%**

$$RCC = 400 \; x \; \frac{100 - 25}{100} x \; \frac{100 - 2}{100} \; x \; \frac{100 - 5.49}{100} \; x \; \frac{100 - .50}{100}$$

= 400 (.75 x .98 x .945 x .995)
= 400 (.6911)
**= 276.46 surfers per day from September to November**

*Exercise 2: Small Island Case*

B. For Viewers/spectators

1.

$$CC = \frac{1\ hectare}{5\ m^2}$$

$$= \frac{10{,}000\ m^2}{5\ m^2}$$

**= 2,000 viewers per day**

2. PCC, compute first the rotation coefficient (RC)

- $$RC = \frac{12\ hours}{6\ hours}$$

  **= 2 hours per day**

- $PCC = CC\ x\ RC$
  = 2,000 x 2
  = **4,000 viewers per day**

3. RCC, compute first the corrective factors

- Intense sunlight (L*f*1)
  - 3 hours (12 noon to 3 pm) per day

  M1 = 3 hours per day
  Mt = 12 hours per day

  $$Lf_{1=} \frac{M1}{Mt}\ x\ 100$$

  $$Lf_{1=} \frac{3}{12}\ x\ 100$$

  **= 25%**

*Exercise 2: Small Island Case*

- Stalls (*Lf2*)

  M1 = 10% of the area or 1,000 sq. m.
  Mt = 1 hectare or 10,000 sq. m.

  $$Lf_{2=} \frac{M1}{Mt} \; x \; 100$$

  $$Lf_{2=} \frac{1{,}000}{10{,}000} \; x \; 100$$

  **= 10%**

- Available CRs (L*f*3)

  M1 = 15 CRs are available, hence, limited by 5 CRs
  Mt = 1 CR per 100 viewers or 20 CRs

  $$Lf_{3=} \frac{M1}{Mt} \; x \; 100$$

  $$Lf_{3=} \frac{5}{20} \; x \; 100$$

  **= 25%**

- Typhoon (L*f*4)

  M1 = 5 days in November
  Mt = 3 months (September to November) or 91 days

  $$Lf_{4=} \frac{M1}{Mt} \; x \; 100$$

  $$Lf_{4=} \frac{5}{91} \; x \; 100$$

  **= 5.495%**

$$RCC = 2{,}000 \; x \; \frac{100-25}{100} x \; \frac{100-10}{100} \; x \; \frac{100-25}{100} \; x \; \frac{100-5.495}{100}$$

= 4,000 (.75 x .90 x .75 x .945)

= 4,000 (.4784)

**= 1,913.7 viewers per day from September to November**

*Exercise 2: Small Island Case*

**Exercise No. 3**
**Carrying Capacity in Protected Areas**

1. Compute the number of snorkelers that can be allowed in the Pamilacan Island given the following:

   - Total area of sanctuary = 140,000 sq m
   - Total area in the sanctuary where snorkeling is allowed: 70,000 sq m
   - Standard area/space requirement per snorkeler/visitor = 150 sq m (Pangemanan et al 2012)
   - Time (hour) sanctuary is opened for snorkeling (6am to 5pm) = 11 hours
   - Average no. of hours spent in snorkeling = 1.5 hour
   - (Lf1) Typhoon, strong waves and current in a year = 30 days
   - (Lf2) Available time of snorkeling in a day (9am to 1pm) = 4.0 hours
   - (Lf3) Intense sunlight in a day (11am to 3pm) = 4.0 hours

2. Compute also the Potential Carrying Capacity and the Real Carrying Capacity

3. What management strategies could be applied to increase the number of snorkelers that can be allowed in the area?

*Exercise 3: Pamilacan Island Case*

**Answers to Exercise No. 3**
**Carrying Capacity in Protected Areas**

1.

$$CC = \frac{70{,}000\ \text{m2}}{200\ m^2}$$

= 466.66 or **467 snorkelers per day**

2. PCC, compute first the rotation coefficient (RC)

- RC

$$RC = \frac{11\ hours}{1.5\ hours}$$

**= 7.33**

- PCC = CC x RC
  = 467 x 7.33
  **= 3,423 snorkelers per day**

3. RCC, compute first the L*f*

$$RCC = PCC\ x\ \frac{100 - Lf_1}{100} x\ \frac{100 - Lf_2}{100}\ x\ \frac{100 - Lf_3}{100}\ x\ \frac{100 - Lf_n}{100}$$

$$Lf_{1=}\ \frac{typhoons, strong\ waves\ and\ current\ in\ a\ year}{no.\ of\ days\ snorkeling\ area\ is\ open\ in\ a\ year}$$

$$Lf_{1=}\ \frac{30\ days}{365\ days}\ x\ 100$$

$Lf_1$= **8.22**

$$Lf_2 = \frac{available\ time\ of\ snorkeling\ in\ a\ day\ (9am\ to\ 1pm)}{time\ (hour) sanctuary\ is\ open\ for\ snorkeling\ in\ a\ day}$$

$$Lf_2 = \frac{4\ hours}{11\ hours} x\ 100$$

$Lf_2 =$ **36.36**

$$Lf_3 = \frac{intense\ sunlight\ in\ a\ day\ (11am\ to\ 3pm)}{time\ (hour) sanctuary\ is\ open\ for\ snorkeling\ in\ a\ day}$$

$$Lf_3 = \frac{4\ hours}{11\ hours} x\ 100$$

$Lf_3 =$ **36.36**

Substituting these values, then:

$$RCC = PCC\ x\ \frac{100 - 8.22}{100} x\ \frac{100 - 36.36}{100}\ x\ \frac{100 - 36.36}{100}$$

$$RCC = 3{,}423\ snorkelers\ x\ (0.9178\ x\ 0.6364\ x\ 0.6364)$$

$$RCC = 3{,}423\ snorkelers\ x\ (0.3717)$$

$$RCC = \mathbf{1{,}272\ snorkelers\ per\ day}$$

*Exercise 3: Pamilacan Island Case*

# ANNEX D
# INTERVIEW SCHEDULE ON CARCAP-PA FOR DENR AND PA MANAGERS & SENIOR STAFF

| | |
|---|---|
| Interviewer | |
| Date of Interview | |
| Name of Respondent | |
| Position | |
| Office | |

## General Information on the Protected Area (PA)

| | |
|---|---|
| 1. Name of PA | |
| 2. Total area of the PA (has.) | |
| 3. What are the tourism attractions/activities in the PA? Describe each in terms of area/size covered (has. or sq. m.), available facilities and number, payment for the use of facilities and other related fees, and limitations required on their use. | |

| Attraction/Activity (camping swimming, trekking, etc.) | Total Size or Area (has.) | Existing Facilities and Number | Fees and Related Costs | Limitations for the use of the area and facilities |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

4. How much area (has. or sq. m.) in each tourism attraction/activity is necessary to make the visit of a tourist or a group of tourists satisfactory and enjoyable? How many hours a day are these facilities open for use? How many are there per group of tourists?

| Attraction/Activity (camping swimming, trekking, etc.) | No. of hours open/ available for tourists | Area necessary (has.)/Standards | | |
|---|---|---|---|---|
| | | Per tourist/visitor | Per group of tourists and visitors | How many per group? |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

5. Among the different tourist attractions/activities in the PA, what are the three most popular? Why?

| Attraction/Activity (camping swimming, trekking, etc.) | Reasons |
|---|---|
| | |
| | |
| | |

## Other Limiting Factors

1. How do the following affect or limit the use of visitors/tourists of various facilities in the PA? How could these limitations be addressed (i.e., total magnitude of each limitation)?

| Limiting Factors | Extent/Scope of limitation in relation to a particular tourism attraction/ activity (Lf1) | Remarks (e.g., how to address the limitation; Total Magnitude of Factors, LfT) |
|---|---|---|
| **Size of the facility** | | |
| **Operating hours** | | |
| **Existing Facilities** | | |

| | | |
|---|---|---|
| **Rules and Regulations imposed by PA operators** | | |
| **Closure period for maintenance purposes** | | |
| **Topography (specify condition)** | | |
| **Climate and inclement weather condition** | | |
| **Availability of water** | | |
| **Availability of manpower and tour guides** | | |
| **Distance from the nearest highway** | | |
| **Availability of transportation facilities** | | |
| **Overall cost involved** | | |
| **Peace and order condition** | | |
| **Presence of threatened species (area requirement for protection)** | | |
| **Areas for protection/Habitat of species** | | |
| **Cultural/religious practices** | | |
| **Others: _____** | | |
| **Others: _____** | | |
| **Others: _____** | | |

2. What are the problems you encountered in the PA/tourist attraction? What solutions could be recommended to address them?

| Problems | Solutions |
|---|---|
| | |
| | |
| | |
| | |
| | |

# ANNEX E
# INTERVIEW SCHEDULE ON CARCAP-PA FOR VISITORS

| | |
|---|---|
| Interviewer | |
| Date of Interview | |
| Name of Respondent | |
| Address | |

## Visitor's Profile

| SOCIO-DEMOGRAPHIC CHARACTERISTICS | |
|---|---|
| 1. Age | |
| 2. Gender | |
| 3. No. of family members | |
| 4. Educational attainment | |
| 5. Religion | |
| 6. Ethnic group | |
| 7. Organizational affiliation | |
| 8. Hobbies | |
| **ECONOMIC VARIABLES** | |
| 1. Occupation/Profession | |
| 2. Monthly Income (PhP) | |

| | Amount |
|---|---|
| **1. Primary** | |
| **2. Secondary/Others** | |

<table>
<tr><td>3. Monthly Expenditure</td><td>
<table>
<tr><th></th><th>Amount</th></tr>
<tr><td>1. Food</td><td></td></tr>
<tr><td>2. Clothing</td><td></td></tr>
<tr><td>3. Education</td><td></td></tr>
<tr><td>4. Health</td><td></td></tr>
<tr><td>5. Transportation</td><td></td></tr>
<tr><td>Others: _____</td><td></td></tr>
<tr><td>Others: _____</td><td></td></tr>
<tr><td>Others: _____</td><td></td></tr>
</table>
</td></tr>
<tr><td>4. How would you classify your status in life at present?</td><td>[Rich, average, or poor? Why?]</td></tr>
<tr><td colspan="2">TOURISM/RECREATIONAL PREFERENCES</td></tr>
<tr><td>1. Manner of visit</td><td></td></tr>
<tr><td>• Individual or single</td><td></td></tr>
<tr><td>• Group</td><td>
<table>
<tr><th>Companion (family members, friends, relatives, etc.)</th><th>Number</th></tr>
<tr><td>1.</td><td></td></tr>
<tr><td>2.</td><td></td></tr>
<tr><td>3.</td><td></td></tr>
<tr><td>4.</td><td></td></tr>
<tr><td>5.</td><td></td></tr>
<tr><td>6.</td><td></td></tr>
<tr><td>7.</td><td></td></tr>
<tr><td>8.</td><td></td></tr>
<tr><td>9.</td><td></td></tr>
<tr><td>10.</td><td></td></tr>
</table>
</td></tr>
<tr><td>2. Reasons for visit</td><td></td></tr>
</table>

<table>
<tr><td>3. Type of activities preferred</td><td>
<table>
<tr><th>Hard activities</th><th>Reason</th></tr>
<tr><td>1.</td><td></td></tr>
<tr><td>2.</td><td></td></tr>
<tr><td>3.</td><td></td></tr>
<tr><td>4.</td><td></td></tr>
<tr><td>5.</td><td></td></tr>
<tr><th>Soft activities</th><th>Reason</th></tr>
<tr><td>1.</td><td></td></tr>
<tr><td>2.</td><td></td></tr>
<tr><td>3.</td><td></td></tr>
<tr><td>4.</td><td></td></tr>
<tr><td>5.</td><td></td></tr>
</table>
</td></tr>
<tr><td>4. Facilities required/preferred (e.g. camping area, benches, or comfort rooms) and why?</td><td>
<table>
<tr><th>Facilities</th><th>Number</th><th>Reason</th></tr>
<tr><td>1.</td><td></td><td></td></tr>
<tr><td>2.</td><td></td><td></td></tr>
<tr><td>3.</td><td></td><td></td></tr>
<tr><td>4.</td><td></td><td></td></tr>
<tr><td>5.</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>5. Equipment or gadget brought to the site</td><td>
<table>
<tr><th>Equipment/Gadget</th><th>Number</th><th>For what purpose/use</th></tr>
<tr><td>1.</td><td></td><td></td></tr>
<tr><td>2.</td><td></td><td></td></tr>
<tr><td>3.</td><td></td><td></td></tr>
<tr><td>4.</td><td></td><td></td></tr>
<tr><td>5.</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>6. How many times in a year do you come to this place?</td><td></td></tr>
<tr><td>7. Do you plan to come back here?</td><td></td></tr>
<tr><td>• If yes, when?</td><td></td></tr>
<tr><td>• If no, why?</td><td></td></tr>
</table>

## General Information on the Protected Area (PA)

| 1. Name of PA | |
|---|---|
| 2. What are the tourist attractions/activities and respective facilities available in the PA? How much did you spend for their use, including the facilities? What are the limitations imposed by the PA management on their use? | |

| Attraction/Activity (camping swimming, trekking, etc.) | Existing Facilities and Number | Fees and Related Costs | Limitations for the use of the area and facilities |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

3. How much area (has. or sq. m.) in each tourist attraction or for each tourism activity is necessary to make your visit, either as an individual or group, satisfactory and enjoyable? How many hours in a day are these facilities open for use? How many are you per group of tourists?

| Attraction/Activity (camping swimming, trekking, etc.) | No. of hours open/ available for tourists | Area necessary (has.)/Standards | | |
|---|---|---|---|---|
| | | Per tourist/visitor | Per group of tourists and visitors | How many per group? |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| 4. Among the different tourist attractions/activities in the PA, what are the three most popular? Why? | |
|---|---|
| **Attraction/Activity (camping swimming, trekking, etc.)** | **Reasons** |
| | |
| | |
| | |

## Other Limiting Factors

1. How do the following affect or limit the use of visitors/tourists of various facilities in the PA? How could these limitations be addressed (i.e., total magnitude of each limitation)?

| Limiting Factors | Extent/Scope of limitation in relation to a particular tourism attraction/ activity (Lf1) | Remarks (e.g., how to address the limitation; Total Magnitude of Factors, LfT) |
|---|---|---|
| **Size of the facility** | | |
| **Operating hours** | | |
| **Existing Facilities** | | |
| **Rules and Regulations imposed by PA operators** | | |
| **Closure period for maintenance purposes** | | |
| **Topography (specify condition)** | | |
| **Climate and inclement weather condition** | | |
| **Availability of water** | | |
| **Availability of manpower and tour guides** | | |
| **Distance from the nearest highway** | | |
| **Availability of transportation facilities** | | |
| **Overall cost involved** | | |
| **Peace and order condition** | | |
| **Presence of threatened species (area requirement for protection)** | | |
| **Areas for protection/Habitat of species** | | |

| | | |
|---|---|---|
| **Cultural/religious practices** | | |
| **Others:** _____ | | |
| **Others:** _____ | | |
| **Others:** _____ | | |

| 2. What are the problems you encountered in the PA/tourist attraction? What solutions could be recommended to address them? | |
|---|---|
| **Problems** | **Solutions** |
| | |
| | |
| | |
| | |
| | |


Sr. Sto. Niño

# IN THIS SEGMENT



# Trail Resources Assessment and Monitoring for Protected Area Officers and Ecotourism Guides

An intact and functioning ecosystem provides irreplaceable services. Ecosystems are essential to life. Mountains in particular help regulate the climate, produce oxygen, and act as water filters and sources of food and resources. In the Philippines, many of our mountains have been designated as terrestrial protected areas. Our mountains host a collection of important ecosystems.

As a means to raise funds for the protection of these areas, many mountains have been developed into ecotourism destinations.

Sustainable ecotourism requires a continuous assessment and monitoring of ecological health, biodiversity, and visitation impact. Great commitment from both the management of the protected area and the local stakeholders are also needed. It is the duty of these sectors to raise awareness about environmental issues in the protected area and promote sustainable tourism practices to ensure that visitors have an enjoyable and enriching travel experience.

## WHAT IS TRAM?

The trail resources assessment and monitoring (TRAM) system is a simplified process for conducting inventory of attractions, geophysical resources, and biodiversity. TRAM is done by protected area officers and local guides in various terrestrial ecotourism destinations in the Philippines.

# TRAM is an easy-to-use method to evaluate the quality of a mountain trail used for ecotourism

## WHY CONDUCT TRAM?

TRAM aims to combine tried-and-tested techniques in natural resource and biodiversity assessment. Modern technology is used to provide participants with easy methods to evaluate the quality of a mountain trail for ecotourism.

Specifically, TRAM participants must know how to measure geophysical parameters along mountain trails; how to conduct simplified biodiversity resource assessment; how to record observations using a TRAM Field Diary (Annex A); and how to use modern digital technology and the data gathered. Data are then used to formulate visitor management policies, which include preventive and corrective measures to maintain an ecotourism destination's natural environment.

## WHO CONDUCTS TRAM?

TRAM is conducted by local ecotourism guides, including women. Allowing local guides to participate in resource assessment and monitoring will help them formulate "a story to tell" in the form of a nature interpretation plan.

## WHERE AND WHEN IS TRAM CONDUCTED?

As its name implies, TRAM is conducted on all tourist-visited trails within an ecotourism site, from the jump-off point to the peak, and then down the mountain. Ideally, Teams traverse one trail to the peak and another trail to descend the other side. Both trails may be evaluated in just one trip TRAM is conducted every six months, preferably right before and after the peak months of tourism to examine visitation impact.

**Trails serve as "tramways" toward sustainable ecotourism in protected areas.**

## HOW DOES ONE PREPARE FOR TRAM?

Start by preparing the following materials and equipment:

- Pencils, pens, or markers
- A small notebook
- Topographic trail map
- Global positioning system (GPS) device
- Digital camera
- Digital video recorder
- Digital sound recorder
- Binoculars
- Head-mounted flashlights or headlamps
- Measuring tape
- Thermometer
- Plastic rope
- Hand-held net
- References for species identification (e.g., Annexes B, C, and D)

**It's best to use an all-in-one device like a camera-GPS-phone with all the digital functions needed for TRAM.**

## HOW DOES ONE CONDUCT TRAM? (A VISUAL GUIDE)

1. Begin at the trailhead or starting point of the trail by photographing the welcome sign, visitor information or registration station, rules and regulations sign and other signage and facilities.

2. While walking along the trail, stop at areas where visitors are likely to stop like resting areas, picnic areas, view decks, campsites, unique rock formations or other remarkable features. Mark each location on a topographic trail map and/or GPS device as a MONITORING SITE.

3. In a small notebook, record the date, time, weather, air temperature (in degrees Celsius [°C]), altitude (in meters above sea level [masl]) and GPS coordinates of each monitoring site.

4. Take a photo of the trail.

5. Photograph any notable views, attractions, and natural features.

6. Photograph all signage and facilities like benches, tables, and railings.

7. Photograph any signs of negative visitor impact, such as graffiti, tree carving, and garbage.

8. Photograph any signs of damage from natural calamities like landslides and fallen trees.

**See Annex A on the PHOTOGRAPHY CHECKLIST for other required photos. Make sure to add remarks/notes for each photograph.**

9. Measure the width of the trail in meters (m) using a meter stick or measuring tape.

10. If present, measure the depth of leaf litter in centimeters (cm).

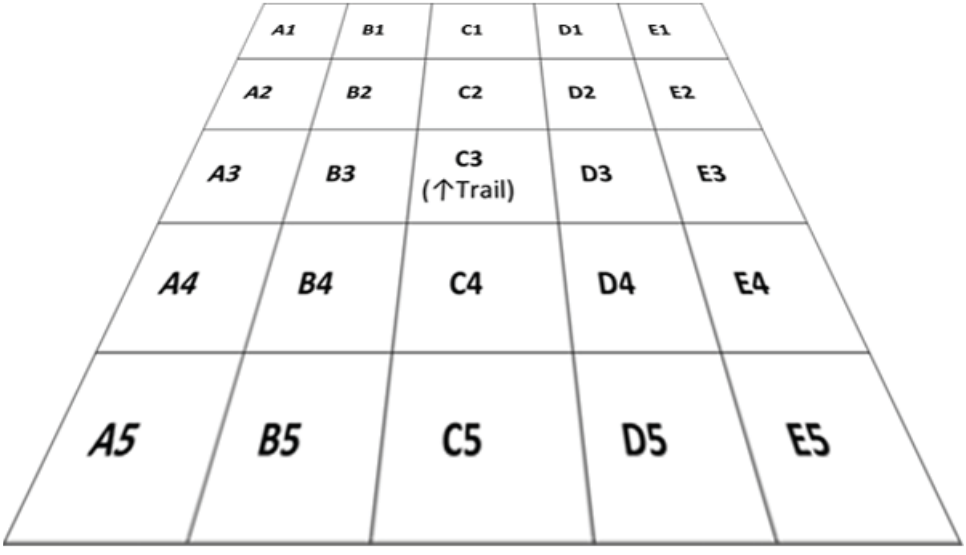
11. Determine the soil type (e.g., clay, loam, sand, clay-loam, sandy-loam, etc.).

12. If there are bodies of water, measure the stream width and water depth in meters (m).

13. Dip the thermometer bulb into the water for 30 seconds before reading the temperature (°C).

14. At each monitoring site, construct a 5×5-meter grid called the SAMPLING AREA. Use plastic twine or rope to delineate the subplots with the trail as the central point. Each subplot should be named using an alphanumeric system. Vertical columns should be named A to E from left to right while the uppermost to the lowermost rows should be named from 1 to 5.

**In case the topography of the area is too steep, the sampling area can be decreased in size or placed adjacent to the trail. For example:**



15. Write down all plant, fungi, and animal species observed within each subplot of the sampling area.

16. Take photographs of all species, especially those classified as threatened, poisonous, edible, or have cultural, ornamental, medicinal, or economic value.

17. Measure the diameter-at-breast-height (dbh) of the largest tree present.

18. Since animals are mobile, one can also make indirect observations beyond the sampling area using tools such as binoculars and video recording devices.

19. Identify and photograph any indirect signs of animal presence, such as footprints, feces, scratch markings, eggs, nests, shells, and exoskeleton cast-offs.

20. Identify and record the sound of animal calls.

21. If present, disturb small sections of leaf litter for any animals that may be hiding underneath.

22. Upon encountering a body of water, observe and identify the surrounding vegetation.

23. Use a hand-held net to catch and identify any animals in the water like fishes, crustaceans, and mollusks. Write down and photograph any debris caught in the fishing net like algae, leaves, seeds, animal bones, and garbage.

24. Do night walks. Walk along riverbanks, streams, and wooded areas to search for animals using head-mounted flashlights or headlamps. Encountered species should be identified, recorded, and photographed. Record any calls heard and any indirect signs of animal presence found like scent markings, feces, and "eye shine" (i.e., reflection of light from the eyes of nocturnal animals).

25. Pay special attention to sites with ecotourism potential like areas with many fireflies.

**If the team will descend the mountain using a different trail, conduct the same methods.**

## HOW OFTEN SHOULD TRAM BE CONDUCTED?

After the peak season of visitation, repeat TRAM.

- When monitoring is repeated after six months or so, the team must visit the same monitoring sites from the last assessment.
- Move, remove, or designate new monitoring sites as the topography of the area changes or if when new infrastructures and official trails are added.

## DATA ANALYSIS GUIDE

1. Plot data from consecutive TRAM periods in tables and graphs.
    - Are there any differences or similarities between different assessments?
    - Discuss any notable trends or anomalies.

2. Are there any species that are new to the area?
    - Are these considered invasive alien species?
    - Discuss possible reasons why these new species were found.

3. Are there any species that that were previously recorded but were not found during succeeding assessments?
    - Are they seasonal plants or migratory animals?
    - Were they over-collected or over-hunted?
    - Was a decline in abundance observed in previous assessments?
    - Discuss possible reasons why this disappearance occurred.

4. Compare recent photos with old photos from previous assessments.

- Did the trail sustain any noticeable damages?
- Did negative visitor impact increase, decrease or remained the same?
- Did previous regulations inhibit or promote negative visitor impact?
- Discuss ways in which to mitigate or correct negative visitor impact.

## GUIDES AND DICHOTOMOUS KEYS TO HELP IDENTIFY TERRESTRIAL SPECIES

AMPHIBIANS

- "Modes of Reproduction of Philippine Anurans" by BROWN WC, ALCALA AC. 1982. Massachusetts, USA: Cambridge Museum of Comparative Biology
- "The Amphibian Faunas of Mt. Banahao, Mt. San Cristobal and Mt. Maquiling, Luzon Island, Philippines" by DIESMOS, AC. 1998. Unpublished MS Thesis. University of the Philippines Los Baños.

BIRDS

- "A Guide to the Birds of the Philippines" by KENNEDY RS, GONZALES PC, DICKINSON EC, MIRANDA HC Jr, FISHER TH. 2000. Oxford University Press, United Kingdom.

MAMMALS

- "Synopsis of Philippine Mammals" by HEANEY LR, DOLAR ML, BALETE DS, ESSELSTYN JA, RICKART EA, SEDLOCK JL. 2010. Fieldiana. 1-1483.
- "A Key to the Bats of the Philippine Islands" by INGLE NR, HEANEY LR. 1992. FIELDIANA, New Series 69: 4-14.

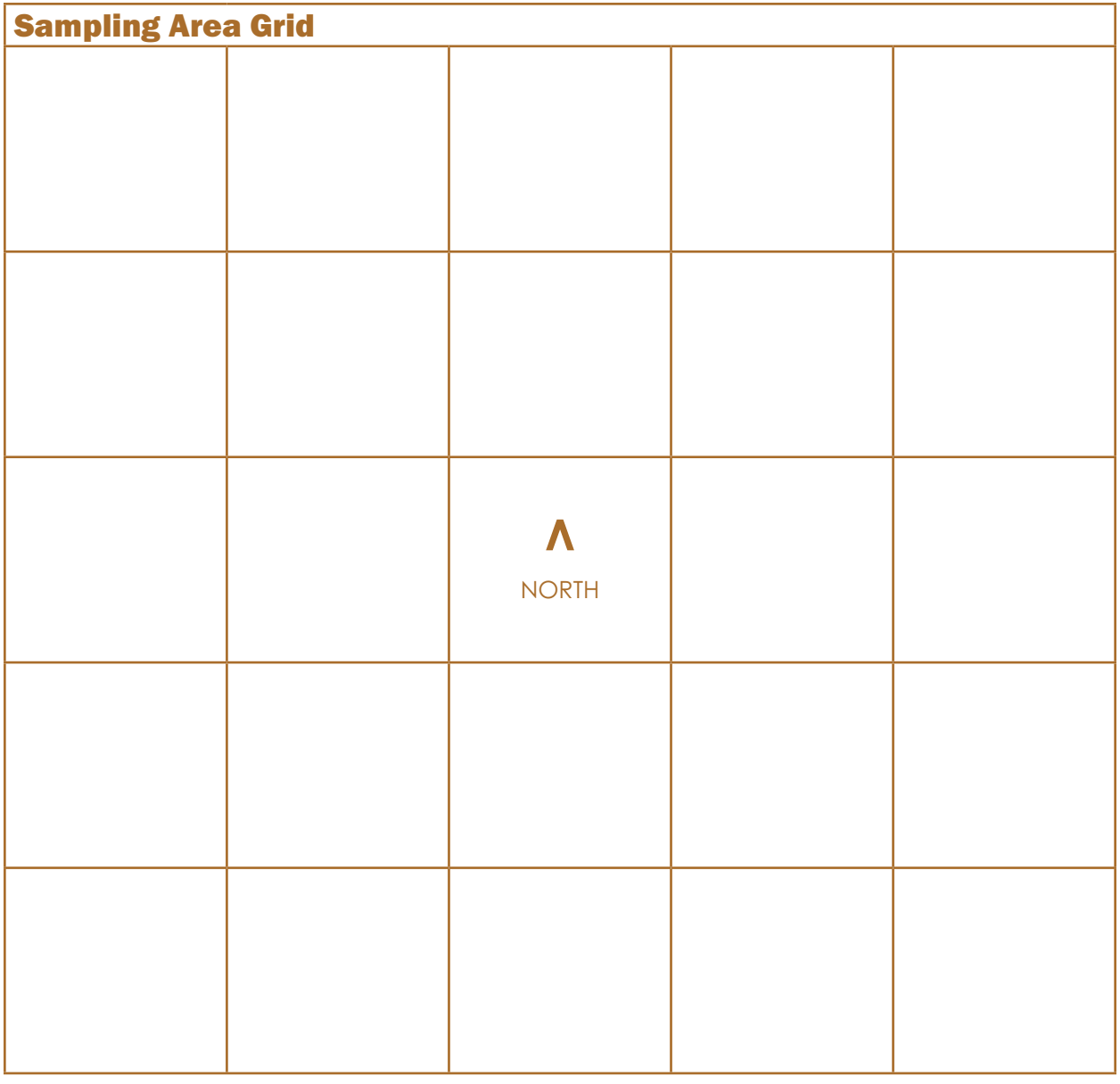
# ANNEX A
# SAMPLE TRAM FIELD DIARY

MONITORING SITE NO. ____

| | |
|---|---|
| Date | |
| Time | |
| Name of Evaluator(s) | |
| Name of Protected Area | |
| Name of Trail | |
| Monitoring Site Location | |
| GPS Coordinates | |

| **Physiochemical Assessment** | |
|---|---|
| Altitude (masl) | |
| Weather | |
| Trail width (m) | |
| Depth of leaf litter (cm) | |
| Soil type | |
| Diameter-at-breast-height (dbh) of largest tree (m) | |
| Stream width (m) | |
| Water depth (m) | |
| Water velocity (m/s) | |

## Sampling Area Grid



| Photography Checklist | | |
|---|---|---|
| [Check Mark] | Item | Remark |
| **1. Signage** | | |
| | Welcome sign | |
| | Rules and regulations sign | |
| | "Parking/No Parking" | |
| | "Beware of falling rocks" | |
| | "Slippery when wet" | |
| | "Do not remove vegetation" | |
| | "No smoking" | |
| | "Campsite" | |
| | "View deck/Picnic area" | |
| | Other signage: _____ | |
| | Other signage: _____ | |
| **2. Signs of negative visitor impact** | | |
| | Graffiti | |
| | Tree/Rock carving | |
| | Burnt vegetation | |
| | Removal of moss patches | |
| | Removal of vegetation | |
| | Garbage | |
| | Widened Trails | |
| | Newly cut trails | |
| | Other signs: _____ | |
| | Other signs: _____ | |
| **3. Signs of damage from natural calamities** | | |
| | Fallen trees | |
| | Flooded/ landslide areas | |
| | Widened waterways | |
| | Dried out waterways | |
| | Burnt vegetation | |
| | Cracks on the ground | |

| | | |
|---|---|---|
| | Other: _____ | |
| | Other: _____ | |
| **4. Trail type** | | |
| | Cemented trail | |
| | Stone slab trail | |
| | Gravel trail | |
| | Soil trail | |
| | Trail of logs | |
| | Trail with tree roots | |
| | Trail with vertical climb | |
| | Trail with rappel | |
| | Trail with cliff-side traverse | |
| | Trail crossing a body of water | |
| | Other: _____ | |
| | Other: _____ | |
| **5. Plants present** | | |
| | Algae | |
| | Lichen | |
| | Bryophytes (Mosses) | |
| | Epiphytes | |
| | Pteridophytes (Ferns) | |
| | Herbs | |
| | Shrubs | |
| | Vines and lianas | |
| | Gymnosperm trees | |
| | Angiosperm trees | |
| | Other: _____ | |
| | Other: _____ | |
| **6. Animals Present** | | |
| | Arachnids | |
| | Insects | |
| | Crustaceans | |

| | | |
|---|---|---|
| | Molluscs | |
| | Annelids | |
| | Fishes | |
| | Amphibians | |
| | Turtles | |
| | Lizards | |
| | Snakes | |
| | Migratory birds | |
| | Eagles/Hawks/Falcons/Owls | |
| | Doves/Pigeons | |
| | Parrots/Cockatoos | |
| | Hornbills | |
| | Other birds | |
| | Flying Mammals | |
| | Non-Flying Mammals | |
| | Other: _____ | |
| | Other: _____ | |
| **7. Indirect Signs of Animal Presence** | | |
| | Animal carcass/road kill | |
| | Footprints | |
| | Feces | |
| | Scratch markings | |
| | Webs | |
| | Cocoons | |
| | Eggs | |
| | Exoskeleton cast-offs | |
| | Bird nests | |
| | Frog foam nests | |
| | Mollusc shells | |
| | Others | |
| | Other: _____ | |
| | Other: _____ | |

| 8. Fungi Present | | |
|---|---|---|
| | Molds | |
| | Mushrooms | |
| | Cup Fungi | |
| | Jelly Fungi | |
| | Bracket Fungi | |
| | Other: _____ | |
| | Other: _____ | |
| **9. Infrastructure** | | |
| | Registration station | |
| | Comfort rooms | |
| | Latrines | |
| | Huts or houses | |
| | Campsite/Camping grounds | |
| | Picnic huts/tables | |
| | Benches | |
| | Trash bins | |
| | View deck | |
| | Other: _____ | |
| | Other: _____ | |
| **10. Utilities** | | |
| | Deep wells | |
| | Water lines | |
| | Outdoor faucets | |
| | Electricity lines | |
| | Electric plugs | |
| | Electric lighting | |
| | Other: _____ | |
| | Other: _____ | |

## Drawings of Some Species Encountered

# ANNEXES B TO D

## Mammals of Mt. Banahaw-San Cristobal National Park

## Large Mammals of Luzon

## Small Mammals of Luzon

# Mammals of Mt. Banahaw-San Cristobal National Park

# Large Mammals of Luzon

*Phloeomys pallidus*
northern giant cloud rat

*Crateromys schadenbergi*
bushy-tailed cloud rat

*Macaca fascicularis*
long-tailed macaque

*Paradoxurus hermaphroditus*
palm civet

*Viverra tangalunga*
Malay civet

*Phloeomys cumingi*
southern giant cloud rat

*Cervus mariannus*
Philippine brown deer

*Sus philippensis*
Philippine warty pig
(male and female)


With thanks to the Philippine Department of Enviroment and Natural Resources, the National Museum of the Philippines, the Barbara Brown and Ellen Thorne Smith Funds, and P. and R. Schnadig for assistance and support.

# Small Mammals of Luzon Island

*Phloeomys pallidus*
Northern giant cloud rat

*Crateromys schadenbergi*
Bushy-tailed cloud rat

*Carpomys phaeurus*
Lesser dwarf cloud rat

*Archboldomys sp.*
Cordillera shrew-mouse

*Apomys datae*
Cordillera forest mouse

*Rhynchomys soricoides*
Cordillera tweezer-beaked rat

*Crocidura grayi*
Luzon shrew

*Batomys granti*
Luzon furry-tailed rat

*Chrotomys whiteheadi*
Cordillera striped earth-rat

 Illustrations by Velizar Simeonovski, Text by Lawrence Heaney, Eric Rickart and Danilo Balete. With thanks to the Philippine Department of Enviroment and Natural Resources, the National Museum of the Philippines, and the Barbara Brown Fund for Mammal Research, FMNH.

# IN THIS SEGMENT



# Marine Resources Assessment and Monitoring for Ecotourism

## WHY ASSESS AND MONITOR MARINE RESOURCES FOR ECOTOURISM?

### Integrated Coastal Management

Tourism is one of the major economic drivers in the Philippines. Being an archipelagic country, the Philippines boasts of pristine and rich marine habitats, which are the major ecotourism products of the country. Ecotourism activities, especially those on the coastal areas, are highly dependent on marine resources, such as mangroves, coral reefs, fish, and marine mammals, among others. Habitat loss and degradation of these resources would eventually result to loss in income from ecotourism. Thus, there is a need to ensure that these resources and habitats stay intact for more sustainable ecotourism activities through proper integrated coastal management (ICM).

ICM is a dynamic process of planning and management involving stakeholders, and requiring the analysis of the environmental and socioeconomic implications of development, the ecosystem processes, and the interrelationships among land-based and marine –related activities. It is adopted as a national strategy to ensure the sustainable development of the country's coastal and marine environment and resources. (E.O. 533, s. 2006)

ICM, which includes coastal resources management, aims to achieve food security, sustainable livelihood, poverty alleviation and reduction of vulnerability to natural hazards, while preserving ecological integrity.

The following are the elements of the ICM programs:

a. interagency, multi-sectoral mechanism
b. coastal strategies and action plans and a fixed term programme of actions
c. public awareness programmes
d. mainstreaming ICM programmes into the national and local governments' plans/ programmes
e. capacity building programmes
f. integrated environmental monitoring; and
g. investment opportunities and sustainable financing mechanisms.

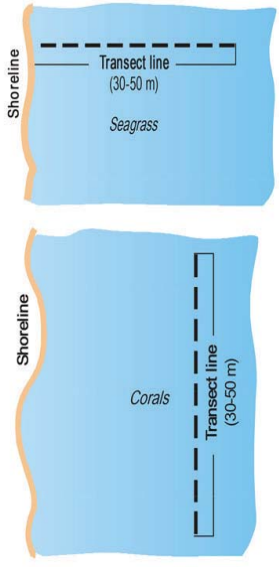
## Role of Women in ICM and the Fisheries Sector

Participation of women in ICM and the fisheries sector are given little importance. Nonetheless, women contribute significantly because:

- Women serve on the frontline in enforcing fisheries regulations and confronting violators.
- Women are seen as better conflict negotiators.
- Women, more than men, attend community meetings.
- Women have little involvement in fish capture.
- Women are involved in near-shore activities.
- Women handle small-scale marketing.

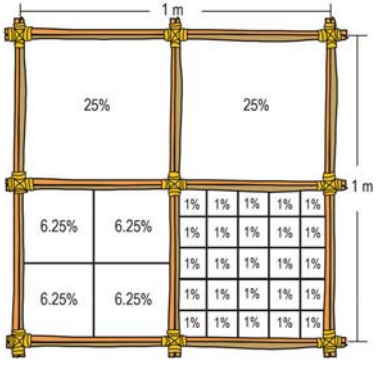
## HOW DOES ONE ASSESS MARINE RESOURCES?

### Use of Transect Lines




The line may be an abaca rope, a nylon string or a fancy transect made of fiberglass. If it's not the commercial kind, calibrate the lines beforehand with one meter intervals. If the habitat starts beyond the shoreline, take note of the distance between the shoreline and where the habitat begins and start laying the transect line perpendicular to the shoreline in the case of seagrasses, and parallel to the shoreline in case of corals. To ensure that the transect will be straight, utilize landmarks as a guide or use the triangulation methods, a compass or even a GPS.

### Use of Quadrats




A quadrat generally measures 1 m x 1 m. It may be made of aluminum or PVC pipes with smaller grids inside or simply of small tree branches or bamboo poles tied together. Placement of the quadrat follows the transect line and is laid down in pre-determined specific intervals. Quadrats are established every 10 m along the transect line to serve as the representative samples of the assessed habitat. A 1 m x 1 m quadrat is divided into 4 sub-squares for easy percentage cover estimation of the assessed coral or seagrass habitat. It is recommended that a suitable number of transect lines and quadrats be used to serve as samples of the assessed habitats.

## Assessment Methods

| | |
|---|---|
| Snorkel survey | • Using snorkeling equipment or goggles, PCRA participants lay a transect line on the bottom part of the assessed area and record its depth.<br>• The snorkeler swims over the transect and estimates the percentage cover of the assessed habitat within 1 m on either side of the transect.<br>• May employ the use of quadrats which are laid down on the sea floor at specific intervals, following the transect line. |
| Point Intercept | • Used by more experienced researchers to precisely estimate and record the relative abundance of living and non-living things on the reef bottom observed within a defined area.<br>• A 50 m transect line is laid parallel to the shoreline and should be kept at the same depth.<br>• When using scuba, a 6-7 m depth is standard. Readings are taken every 25 cm along the line and entered into data sheets. Observations and recordings are taken from one end of the line to the other. |
| Manta Tow | • A manta tow survey is the observation of an underwater area of good visibility by a snorkeler who is being pulled by a small boat.<br>• Manta tow participants note their observations on the condition/ abundance of the assessed habitat at specific intervals.<br>• Useful in generating a "big picture" of the area as the use of a boat allows the snorkeler to cover longer distances. |

(L-R) Snorkel survey, point intercept, and manta tow

## CORAL ASSESSMENT

The goal of the assessment is to measure coral cover percentages within the assessed area through observation and rational estimations of each habitat component. Percentage cover will not only refer to the living corals (hard and soft corals) but also the substrate (dead standing corals, coral rubble, hard rocky surface, sand). All data are then entered into a transect data form.

The following codes/terminologies are used:

- LIVE HARD CORAL (LHC) – coverage of stony or hard corals on the bottom or part of the bottom
- LIVE SOFT CORAL (LSC) – coverage of soft corals attached to the bottom
- DEAD STANDING CORAL (DSC) – recently killed coral still attached and recognizable at the bottom in original upright position
- CORAL RUBBLE (CR) – coverage of loose broken fragments of stony corals or coralline algae on the bottom, with a diameter greater than 1 cm
- HARD ROCKY SURFACE (HRS) – consolidated hard bottom or large blocks of hard reef material not attached to bottom or easily moved around
- SAND/SILT (S)

See Annex A for sample forms on coral habitat assessment. See Annex B for photographs and illustrations of corals.

## SEAGRASS HABITAT ASSESSMENT

Seagrass habitat assessment is highly similar to coral reef assessment and the quadrat size used is 1 x 1 m. The transects and quadrats are laid where the seagrass habitat begins, and end where the observed habitat ends. Intervals between transects and between quadrats are determined by the size and expanse of the habitat. PCRA for seagrass generally employs the snorkel method. Participants must be familiar with the various seagrass species as species identification is an important component of the PCRA. The Philippine has 16 known species of seagrass, the second highest in the world to Australia's count of 23 species.

See Annexes C and D for the assessment form and picture guide, respectively.

## FISH VISUAL CENSUS

Fish visual census is the identification and counting of fishes observed within a defined area. It is used to estimate the variety, numbers and even sizes of common, easily-seen, easily-identified fishes in areas of good visibility. This information may reflect the health of the fish stocks within the surveyed area. Participants must be familiar with the various reef fishes. Where possible, a laminated fish identification guide should be prepared for participants' reference during the conduct of the fish visual census. Faster moving fishes are counted before the slower moving fishes. Each transect covers an area of 500 sq m. Starting at one end of the line, each observer floats on each side of the transect line while observing 5 m to his/her side of the transect and forward to the next 5-m mark. Both observers swim to and stop every 5 m along the line to record the counts of fish per size class until the transect is completed. Total counts are then transcribed onto the data form.

See Annexes E and F for the assessment form and picture guide, respectively.

## CETACEAN SURVEY (MARINE MAMMALS)

### Boat Survey

Use outrigger boat in surveying cetaceans, ideally equipped with a GPS, compass, and other communication equipment. During a boat survey, coordinates of the target areas to be surveyed should be recorded in the GPS beforehand. Important roles during the boat survey include:

- The RIGHT SPOTTER searches from the midpoint of the track line to abeam the port side of the vessel and outward to the horizon or to the extent possible with prevailing environmental conditions.
- The LEFT SPOTTER searches from the midpoint of the track line to abeam the right side of the vessel and outward to the horizon or to the extent possible with prevailing environmental conditions. Observers in the left and right positions frequently search areas on the opposite side of the track lines.

- The DATA RECORDER transcribes transect effort data at regular intervals, makes notes of information pertaining to each sighting, and, when possible, searches the track line adjacent to the vessel with hand held binoculars for schools not detected by the observers on the 25× glasses.

### Aerial Survey

Use a helicopter or airplane following a zigzag lane in the GPS or establish transect waypoints until finishing a target area. Spotters are also employed in this method.

### Approaching Whales and Dolphins

The following reminders are given:

- Always try to approach on a parallel and never cut across or approach head on.
- Do not chase the cetaceans.
- Do not cut across their path.
- Do not approach them head on.
- Do not crowd them.
- Do not rush them.
- Let them make the choice approach or to flee.

### Data Recording

Data recording can be done using a BOAT LOG SHEET or a CETACEAN SIGHTING FORM.

## MARINE RESOURCES MONITORING

### Basic Principles

Monitoring is based on these concepts:

- Monitoring is the process of observing one thing in one place and repeated over a regular period of time using a standard method.

- Before monitoring, benchmarking activities must be made to obtain information against which succeeding monitoring results shall be compared.
- Monitoring and evaluation (M&E) is essential for management to be responsive to the changes that may occur while implementing a project.
- M&E fosters good governance principles of transparency, accountability, and participatory decision-making.

## Key Resource Monitoring Elements

Core environmental indicators refer to impact indicators to the environment. These indicators measure the overall change in the coastal/marine ecosystem resulting from protection and enhancement activities. Some of the important parameters in monitoring marine protection and health include:

- Coral cover and other invertebrates
- Fish biomass
- Seagrass and algae
- Marine mammals
- Mangrove

# ANNEX A
# CORAL REEF HABITAT ASSESSMENT FORMS

## POINT INTERCEPT METHOD DATA FORM

Site Name: Municipality/Province: Date:

Observer: Transect No.: Depth:

| BENTHIC LIFE FORMS/ CORAL REEF COMPONENTS | NO. OF SAMPLING POINTS FOUND | ESTIMATED PERCENTAGE COVER |
|---|---|---|
| Live hard coral | | |
| Live soft coral | | |
| White dead coral | | |
| Dead coral with algae | | |
| Turf algae | | |
| Fleshy microalgae | | |
| Coraline algae | | |
| Sponges | | |
| Other animals | | |
| Seagrass | | |
| Rubble | | |
| Rock | | |
| Sand/Silt | | |

## CORAL REEF HABITAT ASSESSMENT TRANSECT DATA FORM

**Date:** **Location:**

| Transect No. | Quadrat No. | LHC | LSC | DSC | CR | HRS | S | Total | Other Observations |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
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## MANTA TOW DATA FORM

**Site Name:** **Date:**

| Tow No. | Location | Hard Coral | Soft Coral | Dead Standing Coral | Coral Rubble | Hard Rock Surface | Sand | Total |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
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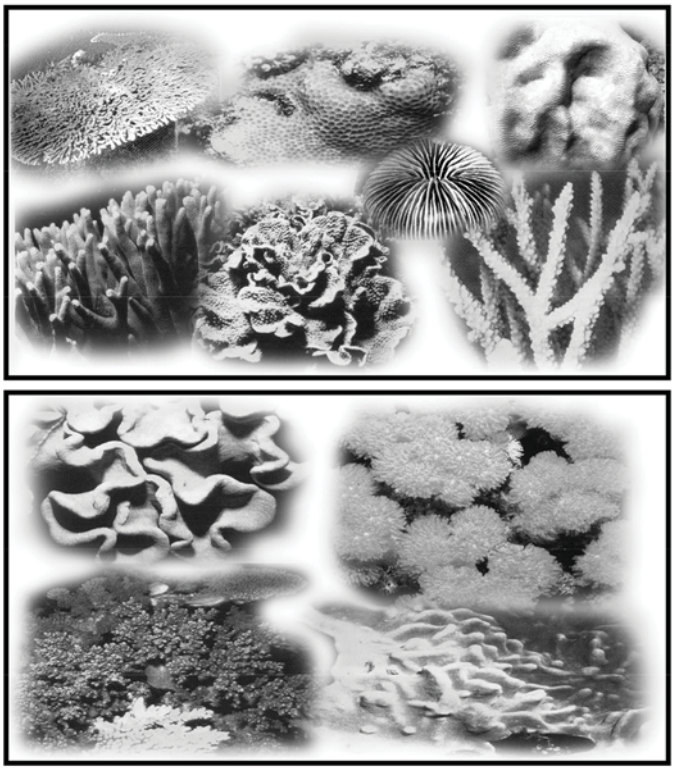
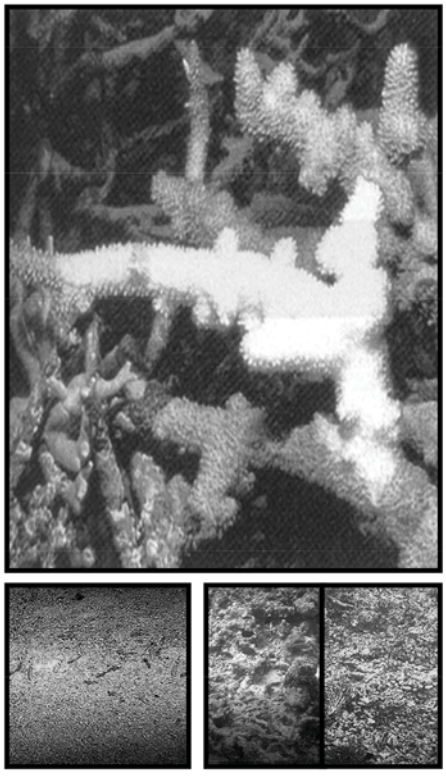
# ANNEX B
# PHOTOGRAPHS/ILLUSTRATIONS OF CORALS



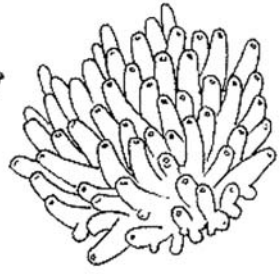
Top-Bottom: Hard corals, soft corals



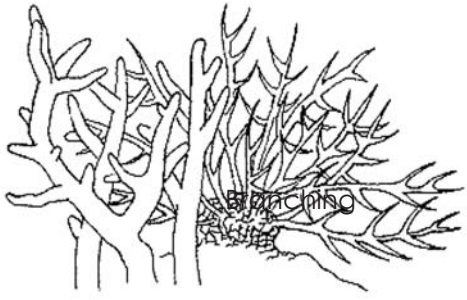
Top: Dead coral
Bottom L-R: Sand/silt, Rock/rubble

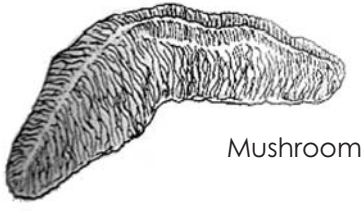
# Coral Life Forms

Table

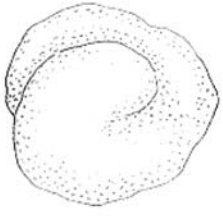


Digitate



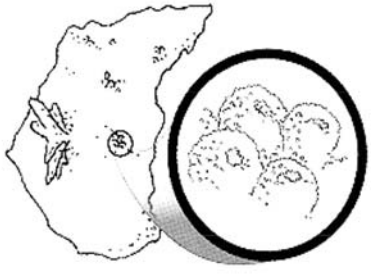



Mushroom

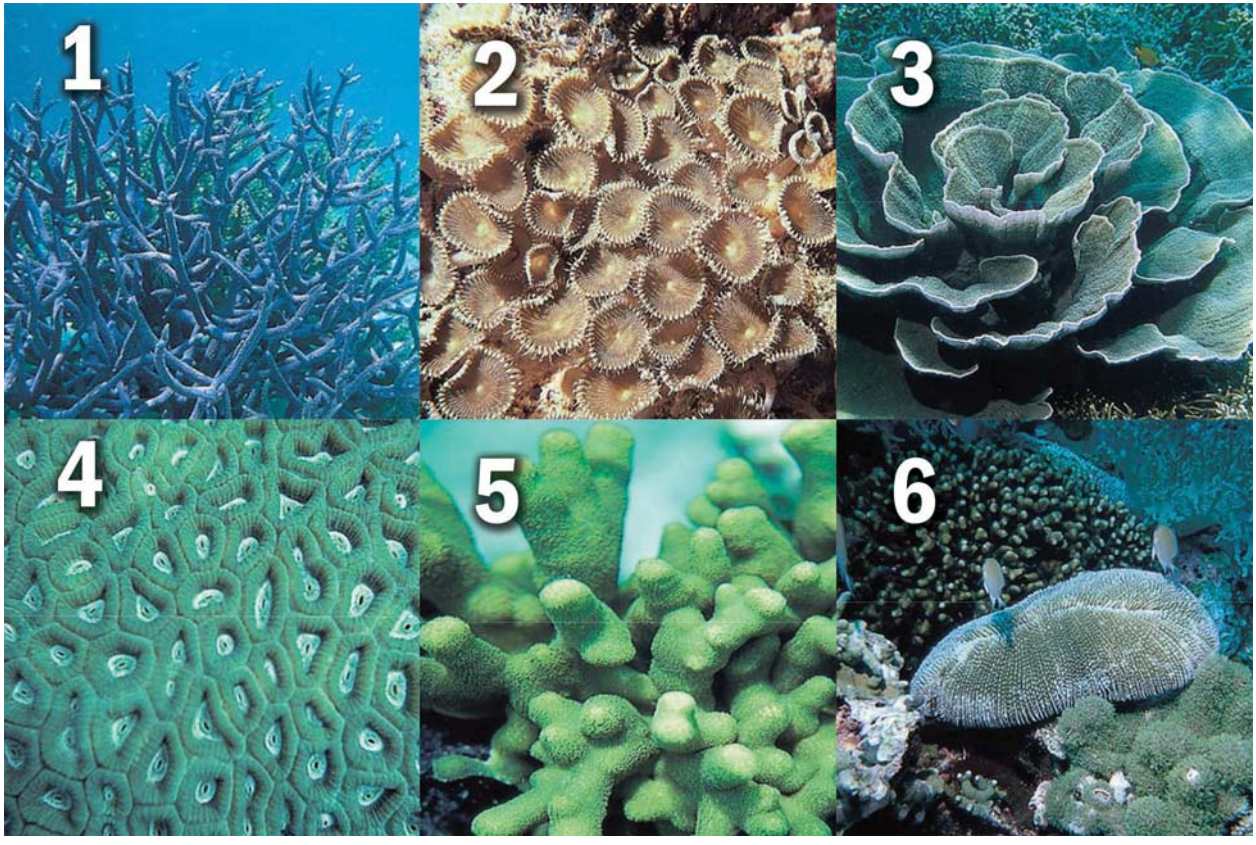


Massive

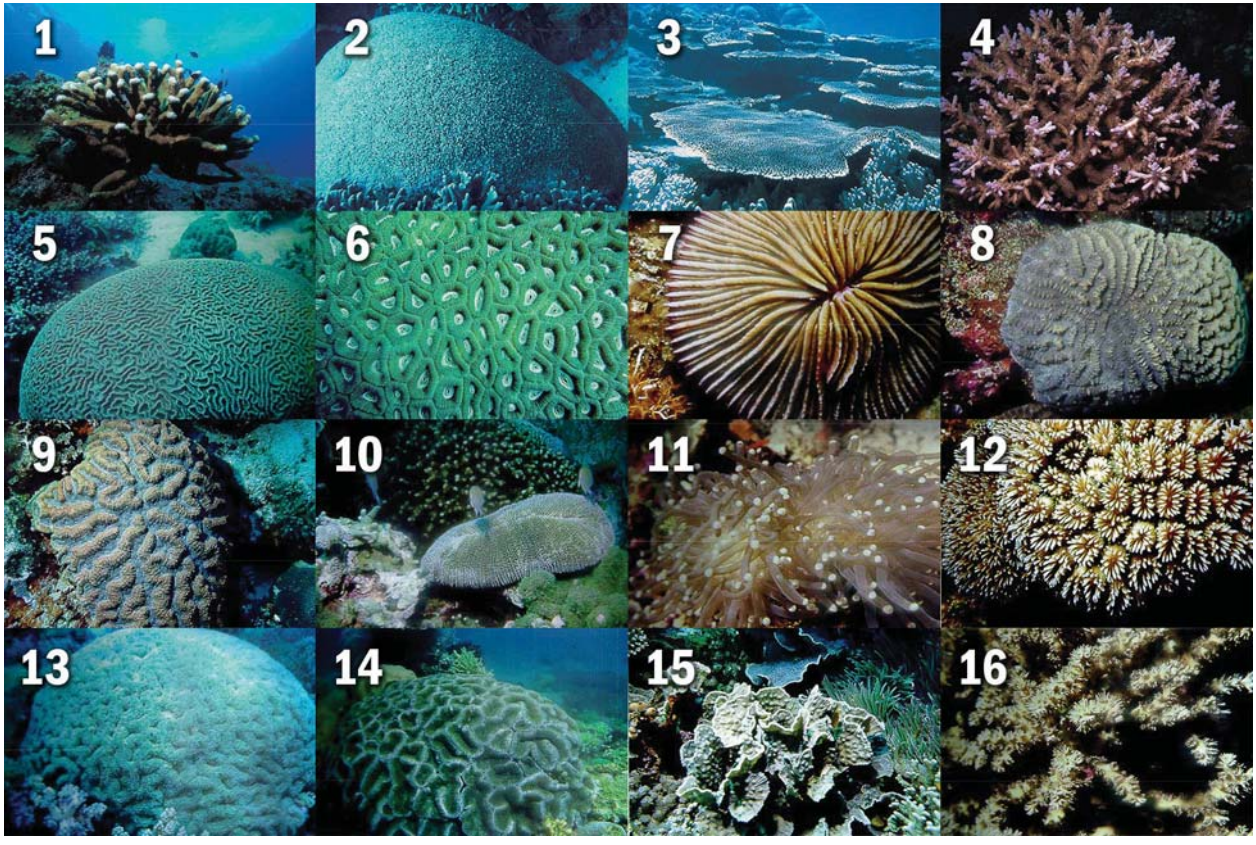
Foliose



Encrusting




1. BRANCHING – at least two degrees branch
2. ENCRUSTING – major portion attached to substratum as a laminar plate
3. FOLIOSE – coral attached at one or more points, leaf-like or plate-like appearance
4. MASSIVE – solid boulder or mound
5. SUB-MASSIVE – tends to form small columns, knobs, or wedges plate
6. MUSHROOM – solitary, unattached or free-living corals




1. *Acropora palifera* Columnar branching coral
2. *Astreopora* sp. Starflower coral
3. *Acropora* sp. Table coral
4. *Acropora* sp. Tubular branching coral
5. *Oulophyllia crispa* Intermediar valley coral
6. *Favia* sp. Knob coral
7. *Cycloseris patelliformis* Hermit coral
8. *Platygyra lamellina* Lesser valley coral
9. *Leptoria* sp. Least valley coral
10. *Fungia* sp. Mushroom coral
11. *Heliofungia actiniformis* Anemone mushroom coral
12. *Galaxea fascicularis* Octopus coral
13. *Symphillia* sp. Sinuous cup coral
14. *Lobophillia costata* Lobed cup coral
15. *Mycedium elephantotus* Chinese lettuce coral
16. *Archelia horrescens* Octopus coral

Source: Philippine Coral Reefs: A Natural History Guide (White 2001)

# ANNEX C
# SEAGRASS HABITAT ASSESSMENT FORM

Date: Location/Areas Covered:

| Transect No. | Quadrat No. | Species | Percentage Cover | Substrate | Other Observations |
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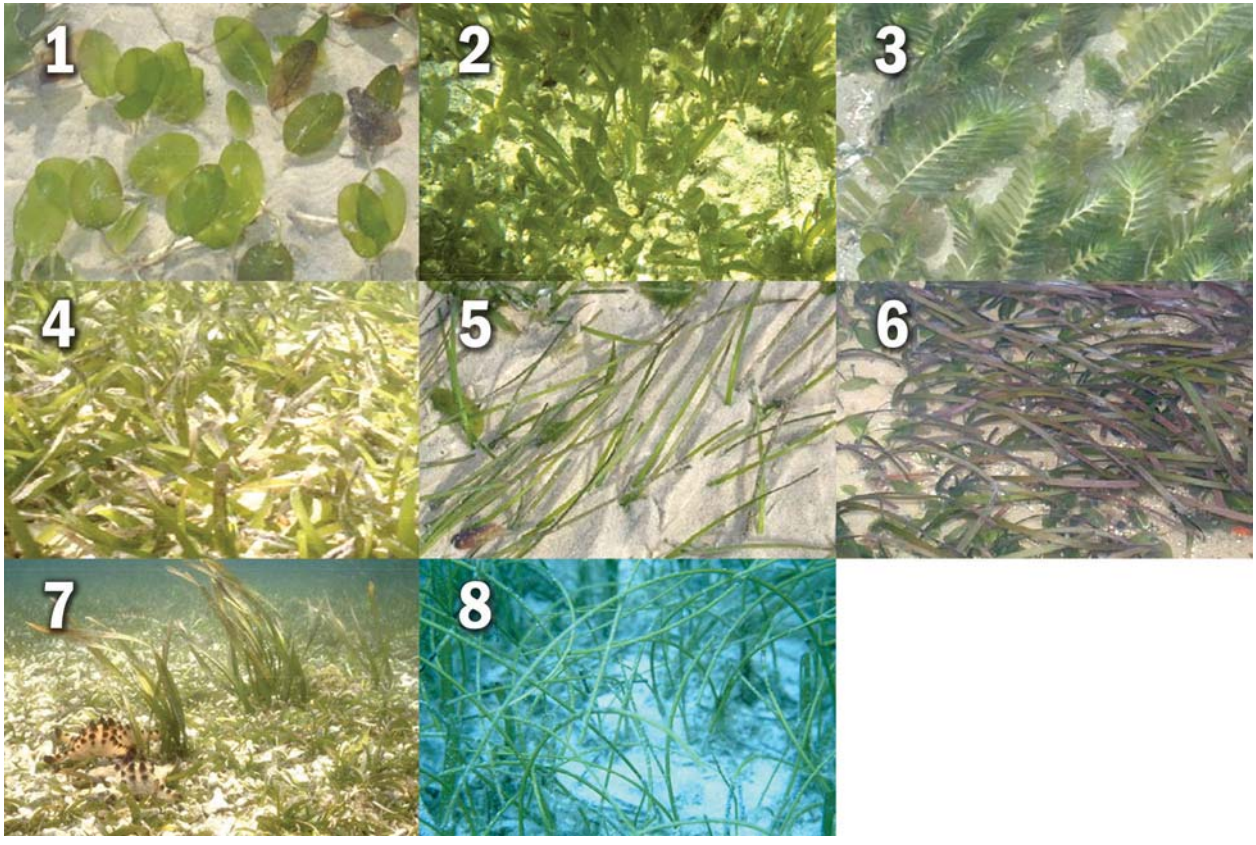
# ANNEX D
# PHOTOGRAPHS OF SEAGRASS




1. Spoon seagrass - *Halophila ovalis* Family Hydrocharitaceae
2. Beccari's seagrass - *Halophila beccarii* Family Hydrocharitaceae
3. Fern seagrass - *Halophila spinulosa* Family Hydrocharitaceae
4. Sickle seagrass - *Thalassia hemprichii* Family Hydrocharitaceae
5. Needle seagrass - *Halodule uninervis* Family Cymodoceae
6. Ribbon seagrass - *Cymodocea rotundata* Family Cymodoceacea
7. Eel seagrass - *Enhalus acoroides*
8. *Syringodium isoetifolium*

# ANNEX E
# FISH ABUNDANCE DATA FORM

| Site | | Municipality and Province | |
|---|---|---|---|
| Transect No. | Depth (m) | Coordinates | |
| Date (M/D/Y) | Time | Left Observer | Right Observer |

| Habitat Notes | Horizontal Visibility | Angle of Slope | Transect Orientation (NEWS) |
|---|---|---|---|
| | | | |

| Family | Species | Record no. of fishes per size class | | | |
|---|---|---|---|---|---|
| | | 1-10 cm | 11-20 cm | 21-30 cm | >30 cm (specify) |
| | | | | | |
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# ANNEX F
# FISH ILLUSTRATIONS

# ANNEX G
# SAMPLE MONITORING FORMS

| Location: | | Transect Number: | | Transect side: |
|---|---|---|---|---|
| Site: | | | Rermarks: | |
| Observer: | | | | |
| **Family** | **Fish Counts/Class** | | | |
| | 1-10cm | 11-20cm | 21-30cm | 31-40cm |
| Lapu Lapu (Serranidae) | | | | |
| Asangluman (Lutjanidae) | | | | |
| Katambak (Lethrinidae) | | | | |
| Talakitok (Carangidae) | | | | |
| Timbongan (Mullidae) | | | | |
| Mol mol (Scaridae) | | | | |
| Solig (Caesionidae) | | | | |
| Kumay (Acanthuridae) | | | | |
| Dangit (Siganidae) | | | | |
| Marapunti (Haemulidae) | | | | |
| **Others** | | | | |
| Lindigan (Labridae) | | | | |
| Kamisita (Chaetodontidae) | | | | |
| Katibok Pomacentridae) | | | | |
| Papakul (Balistidae) | | | | |

| DATA SUMMARY FORM | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location: | | | | Municipality and Province: | | | | | | | |
| Month & Yr: | | | | Rermarks: | | | | | | | |
| Observer: | | | | | | | | | | | |
| **Family** | **Fish Counts/Class** | | | | | | | | | | |
| | Inside | | | | | Outside | | | | | |
| | **1** | **2** | **3** | **Total** | **Ave.** | **1** | **2** | **3** | **Total** | **Ave.** |
| | *Subtotal* | | | | | *Subtotal* | | | | |
| **Lapu Lapu** (Serranidae) | | | | | | | | | | |
| **Asangluman** (Lutjanidae) | | | | | | | | | | |
| **Katambak** (Lethrinidae) | | | | | | | | | | |
| **Talakitok** (Carangidae) | | | | | | | | | | |
| **Timbongan** (Mullidae) | | | | | | | | | | |
| **Mol mol** (Scaridae) | | | | | | | | | | |
| **Solig** (Caesionidae) | | | | | | | | | | |
| **Kumay** (Acanthuridae) | | | | | | | | | | |
| **Dangit** (Siganidae) | | | | | | | | | | |
| **Marapunti** (Haemulidae) | | | | | | | | | | |
| **Others** | | | | | | | | | | |
| **Lindigan** (Labridae) | | | | | | | | | | |
| **Kamisita** (Chaetodontidae) | | | | | | | | | | |
| **Katibok** Pomacentridae) | | | | | | | | | | |
| **Papakul** (Balistidae) | | | | | | | | | | |

| Transect Summary Data Sheet | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location: | | | | Transect Number: | | | | | | Transect side: | | | |
| Site: | | | | Date: | | | | | | Remarks: | | | |
| Observer: | | | | | | | | | | | | | |
| **Family** | **Fish Counts/Class** | | | | | | | | | | | | |
| | 1-10cm | | | 11-20cm | | | 21-30cm | | | 31-40cm | | | Total |
| | L | R | ST | L | R | ST | L | R | ST | L | R | ST | |
| Lapu Lapu (Serranidae) | | | | | | | | | | | | | |
| Asangluman (Lutjanidae) | | | | | | | | | | | | | |
| Katambak (Lethrinidae) | | | | | | | | | | | | | |
| Talakitok (Carangidae) | | | | | | | | | | | | | |
| Timbongan (Mullidae) | | | | | | | | | | | | | |
| Mol mol (Scaridae) | | | | | | | | | | | | | |
| Solig (Caesionidae) | | | | | | | | | | | | | |
| Kumay (Acanthuridae) | | | | | | | | | | | | | |
| Dangit (Siganidae) | | | | | | | | | | | | | |
| Marapunti (Haemulidae) | | | | | | | | | | | | | |
| **Others** | | | | | | | | | | | | | |
| Lindigan (Labridae) | | | | | | | | | | | | | |
| Kamisita (Chaetodontidae) | | | | | | | | | | | | | |
| Katibok Pomacentridae) | | | | | | | | | | | | | |
| Papakul (Balistidae) | | | | | | | | | | | | | |

| FISH GRAPHING FORM | | | | | | |
|---|---|---|---|---|---|---|
| Site Name: | | | | Municipality & Province: | | |
| Family (Local Name) | **No-Take-Zone** | | | **Take Zone** | | |
| | 2nd Quarter | 3rd Quarter | 4th Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter |
| Lapu-Lapu | | | | | | |
| Timbongan | | | | | | |
| Molmol | | | | | | |
| Solig | | | | | | |
| Dangit | | | | | | |
| Kumay | | | | | | |
| Marapunti | | | | | | |

## INVERTEBRATE DATA SUMMARIZATION FORM

| Site Name: | Municipality/province: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Zone/Sector | Remarks: | | | | | | | | | |
| Depth: | | | | | | | | | | |
| Month/year: | Outside | | | | | Inside | | | | |
| Transect | 1 | 2 | 3 | | | 4 | 5 | 6 | | |
| Type/groups | Sub-total | | | Total | Avg. | Sub-total | | | Total | Avg. |
| Live hard coral | | | | | | | | | | |
| Soft coral | | | | | | | | | | |
| White dead coral | | | | | | | | | | |
| Dead coral with algae | | | | | | | | | | |
| Sponges | | | | | | | | | | |
| Other animals | | | | | | | | | | |
| Turf Algae | | | | | | | | | | |
| Fleshy macroalgae | | | | | | | | | | |
| Coralline algae | | | | | | | | | | |
| Rubble | | | | | | | | | | |
| Rock | | | | | | | | | | |
| Sand/silt | | | | | | | | | | |
| | | | | | | | | | | |
| Invertebrates | | | | | | | | | | |
| Diadema | | | | | | | | | | |
| Sea cucumber | | | | | | | | | | |
| Giant clams | | | | | | | | | | |

| Causes of coral damage | |
|---|---|
| ☐ Sediment | ☐ Seaweed overgrowth |
| ☐ Blasting patterns | ☐ Other trash |
| ☐ Anchor damage | ☐ Other coral causes |
| ☐ Bleaching | ☐ Other causes: |
| ☐ Crown-of-thorns | ☐ |
| ☐ Plastics | ☐ |

**SEAGRASS DATA FORM**

Slate Data Sheet

Site:
Station:

Data Collected by:
Coordinates:

| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 |
|---|---|---|---|---|---|---|
| Cymodocea | | | | | | |
| Thalassia | | | | | | |
| Halodule | | | | | | |
| Halophila | | | | | | |
| Enhalus | | | | | | |
| Syringodium | | | | | | |

Data Sheet

Site:
Station:

Data Collected by:
Coordinates:

Q1

| Genus | Frequency/Class | | | | | |
|---|---|---|---|---|---|---|
| | 5 | 4 | 3 | 2 | 1 | 0 |
| Cymodocea | | | | | | |
| Thalassia | | | | | | |
| Halodule | | | | | | |
| Halophila | | | | | | |
| Enhalus | | | | | | |
| Syringodium | | | | | | |

Q2

| Genus | Frequency/Class | | | | | |
|---|---|---|---|---|---|---|
| | 5 | 4 | 3 | 2 | 1 | 0 |
| Cymodocea | | | | | | |
| Thalassia | | | | | | |
| Halodule | | | | | | |
| Halophila | | | | | | |
| Enhalus | | | | | | |
| Syringodium | | | | | | |

## Seagrass Assessment Transect Data Form

| Transect no. | Quadrat no. | Species | % cover | Substrate | Other observations |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
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**Marine Mammal Sighting Form**

Date: _____ Sighting #: _____
Time: _____ Observer: _____
General Area of Sighting: _____ Distance from shore: _____

Species sighted:
1. _____
2. _____
3. _____
4. _____

Associated animals:
(List ID and number of other species near the sighting)

Diagnostic features: (describe and sketch the shape of fins, color, size, markings on the species identified)

Behavior: Describe the aggregations, movements, blows, etc. of the animals

A. School behavior (check all that apply)

- ☐ Fast traveling
- ☐ Moderate traveling
- ☐ Slow traveling
- ☐ Milling
- ☐ Associated swimming
- ☐ Approaching shore
- ☐ Bow riding
- ☐ Unknown
- ☐ other

B. School shape

- ☐ Tight and uniform
- ☐ Loose and uniform
- ☐ Unknown
- ☐ Tight and clumped
- ☐ Loose and clumped
- ☐ other

C. School composition

Calves present?

☐ Yes ☐ No ☐ Unknown ☐ other

**FREQUENCY TABLE FOR MANGROVES**

| Transect 1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Species | Plot 1 | | Plot 2 | | Plot 3 | | Total |
| Rhizophora. apiculata | ~~IIII- IIII etc~~ | 17 | ~~IIII- IIII etc~~ | 15 | ~~IIII- IIII etc~~ | 7 | 39 |
| Sonneratia alba | ~~IIII- IIII etc~~ | 26 | ~~IIII- IIII etc~~ | 32 | ~~IIII- IIII etc~~ | 28 | 86 |
| Avicennia marina | ~~IIII- IIII etc~~ | 0 | | 9 | | 13 | 22 |
| Total | | 43 | | 56 | | 48 | 147 |

Relative density (*R. apiculata)* = (39/ 147) x 100 = 26.53%

Relative frequency (*R. apiculata)* =(3/8) x 100 = 37.5%

Relative frequency (*A. marina)* = (2/8) x 100 = 25 %

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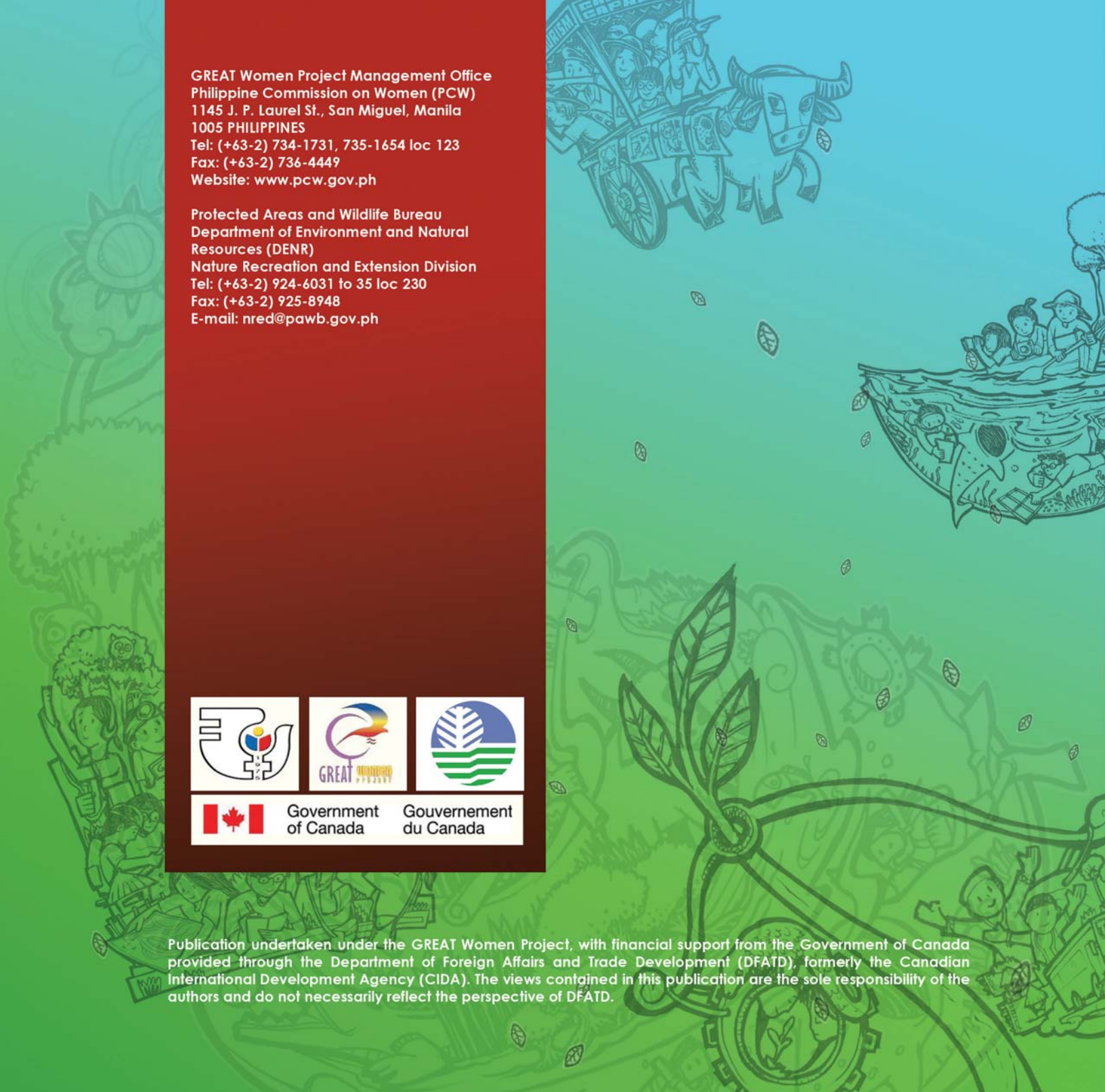

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