NATIONAL ECOTOURISM PLAN

INCEPTION REPORT

for

MINISTRY OF CULTURE, ARTS AND TOURISM
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INTRODUCTION

Background to National Ecotourism Plan

In 1993 the Ministry of Culture, Arts and Tourism invited the IUCN Ecotourism Consultancy Programme to assess the need for a National Ecotourism Plan. The assessment was made by the Co-ordinator of the Programme, Arq. Hector Ceballos-Lascurain, from Mexico, funded by the World Tourism Organisation, Madrid. During the assessment, there were several site visits, and discussions with government agencies, the private sector, non-governmental organizations and tourists.

As a result a working paper was produced that identified the need for such a plan and gave a framework for terms of reference for a proposed study.

In mid 1994 the Ministry of Culture, Arts and Tourism began liaising with the World Wide Fund for Nature (WWF) Malaysia. The working paper was modified to form agreed Terms of Reference for the study. Following the preparation and signature of contracts, work began on 16 December 1994. The National Ecotourism Plan study is a 12 month study due to be completed on 15 December 1995. Appendix I gives the Terms of Reference.

Basic Orientation

In carrying out the study, WWF Malaysia begins with a basic orientation that includes (but is not limited to) the following components:

(1) The Five Year Plans, the existing Malaysian Tourism Policy, and existing State level plans such as the Sarawak Tourism Master Plan are accepted as the framework for the future development of the tourism industry as a whole. The National Ecotourism Plan should accept the general policy orientation of those documents and be consistent with them, so far as the Terms of Reference of the study allow. In addition, every effort should be made to co-ordinate work with current or future studies such as the present agro-tourism plan, the prospective Sabah tourism masterplan and State level plans.

(2) Sustainability is a key word within the Terms of Reference. This should be taken to mean sustainability of the ecotourism industry as a whole, which includes economic sustainability, the sustainability of tourism activities, and sustainability of the physical components (e.g., landscapes, water, soils, air quality) and biological components (e.g., birds, fish, turtles) which are the basis for the industry.

(3) The National Ecotourism Plan needs to be orientated clearly towards low impact dispersed tourism, and make a distinction between ecotourism/localities where activities
are low impact and infrastructure is relatively low key, versus **mass tourism** where activities might be high impact and infrastructure might be highly developed.

(4) The study should aim to show where **mutual support** between sectors is both necessary and advantageous (in a crude example, more flights could be needed to bring increasing numbers of tourists, but more tourists will not come unless there is more accommodation and unless the attractiveness of the destinations is maintained).

(5) Ecotourism includes both natural components and (human) cultural components, but the scope of the cultural components within ecotourism is limited to those aspects of culture which occur in a relatively undisturbed environment, or which indicate the relationship between the human and natural worlds, so that the cultural aspects act as a 'cultural gateway' to a better understanding of nature.

(6) An important but difficult component of the plan will be to ensure effective links between ongoing local and State level activities so as to ensure that the plan is viable at the ground level, rather than providing only a conceptual framework applicable at national level.

**BASIC DEFINITIONS**

**Sustainable Tourism**

Sustainable tourism is understood as a component of sustainable development, which in turn has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Amongst the many other definitions of sustainable development are: "a pattern of social and structural economic transformations (i.e., "development") which optimizes the economic and other societal benefits available in the present, without jeopardizing the likely potential for similar benefits in the future" (Goodland and Ledec, 1987, cited by McNeely, 1988) and "Sustainable development is improving the quality of human life while living within the carrying capacity of supporting ecosystems" (Caring for the Earth: IUCN/UNEP/WWF, 1991).

Under this philosophy, **sustainable tourism**, as defined by Travis and Ceballos-Lascurain (FNNPE, 1992) is "all forms of tourism development, management and activity which enable a long life for the activity of tourism, involving a sequence of economic tourism products, compatible with keeping in perpetuity the protected heritage resource, be it natural or cultural, which gives rise to tourism". Sustainable tourism is thus employed to denote all types of tourism, whether based on natural or human-made resources, that
contribute to sustainable development. As our century comes to a close, there is a pressing need for all types of tourism to be integrated under the general heading of sustainable tourism.

Nature Tourism

**Nature tourism** (also known as nature-based tourism) denotes all tourism directly dependent on the use of natural resources in a relatively undeveloped state, including scenery, topography, water features, vegetation and wildlife. In this sense, nature tourism can include countryside motorbiking, mountaineering, sport hunting and fishing, and white-water rafting, even if the use of the resources by the tourist is not a wise or sustainable one (Healy, 1992b; Butler, 1992; Ceballos-Lascuráin, 1986). Nature tourism also includes the concept of what is known loosely as "adventure tourism", which normally refers to physically exerting and risk-involving activities of a sporting nature, carried out in a more or less undisturbed natural environment.

Ecotourism

**Ecotourism**, as defined by IUCN's Ecotourism Programme is "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features, both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations" (Ceballos-Lascuráin, 1993a). In other words, ecotourism denotes nature tourism with the element of sustainability introduced.

Accordingly, in this study, "nature tourism" and "nature-based tourism" will be used interchangeably to denote tourism dependent on relatively undeveloped natural resources. "Ecotourism" will be used to describe such tourism only when an additional characterisation of sustainability is intended - tourism that is both dependent on relatively undeveloped natural resources, and helps society achieve sustainable development.

If these or similar concepts are used, then the National Ecotourism Plan will interpret ecotourism broadly to include nature tourism activities such as fishing, rafting and mountain climbing, by strengthening their management objectives and operation, and will thus attempt to ensure that all such activities are carried out as sustainable tourism. Although the word ecotourism is new, it is taken here to include many activities that have already been carried out for a long time, sometimes under the name of nature tourism, for example visits to Taman Negara and Kinabalu Park.

It seems necessary to reach a consensus on the scope and definition of ecotourism, so as to reach a consistent understanding of the scope of the study. Finding the above definitions cumbersome, we suggest that ecotourism is simply defined as "tourism which supports conservation of natural resources and habitats".
LOGISTICS AND METHODOLOGY

Manpower

The composition of the project team is as follows, and is in accordance with the agreed contract and Terms of Reference given in Appendix I:

In Peninsular Malaysia there are two staff members working full time on the project, together with secretarial assistance, administration and accounting, and with supervision of the entire project by the head of the Conservation Department, WWF Malaysia.

In Sabah there are two staff members of whom one is working on the project full time and the other is working for eight months of the total project period, together with secretarial assistance.

In addition there is one staff member in Sarawak, working full time on the project.

Methods

The work is being carried out by a combination of:

- site visits;
- interviews;
- compilation of literature;
- consultancy; and
- analysis.

In addition, the possibility of conducting departing visitor surveys by questionnaire is being investigated.

Site visits. It is intended that site visits should be carried out in every State. They will cover a range of different usage intensities: some well known and well used sites (e.g., Taman Negara), some in which use is expanding (e.g., Sungai Kinabatangan), some which are unused (e.g., Danau Loagan), and some which may be over-used and possibly in need of rehabilitation (e.g., Batu Caves).

It is also intended that site visits should cover a wide range of environments, including islands, beaches, mountains, rivers, lakes, mangroves, caves, and other natural habitats that represent an array of ecotourism assets.
In this way the study will also cover a wide range of existing and potential tourism activities and interests, such as bird-watching, botany, archaeology, mountain-climbing, river rafting, diving, etc.

**Interviews.** Interviews will be conducted in every State as well as at Federal level. They will include a range of agencies related to the tourism and ecotourism industry including the government sector, the private sector, and individuals including tourists during and after participation in ecotourism activities. The views of non-governmental organizations will also be solicited.

The results of interviews will be compared to identify main points and to assess the validity and relevance of opinions as well as the backing they may receive from other study methods.

**Compilation of literature.** Existing data and information will be compiled from a wide range of sources including literature published in Malaysian and overseas; reviews of the status of tourism and ecotourism; specific studies of carrying capacity, low impact technology, architecture, etc.; unpublished surveys and reports; brochures and other literature available to and aimed at tourists in Malaysia and overseas; and other forms of information where available.

**Consultancy.** The International Consultant to the National Ecotourism Plan is Arq. Hector Ceballos-Lascurain, the Co-ordinator of the IUCN Ecotourism Consultancy Programme, Mexico City. He is to spend one month in Malaysia in two 2-week visits of which the first took place in January 1995 and the second is planned for July-August.

A total of two man-months consultancy time is available for local consultants. WWF Malaysia has begun discussions with several individuals concerning the possibility of work on the following topics:

- an advised economic framework to ensure equitable distribution of benefits between government, private sector and local communities;

- marketing and promotional strategies for ecotourism products locally and overseas;

- carrying capacity specifications;

- mechanisms and co-ordination of ecotourist guides' training programmes;

- certification of standards of companies, guides and tour packages.

Given time/budgetary constraints it will only be possible to cover a selection of the above topics by consultancy, and the remainder will be included in the work of the main team.
**Analysis.** Quantitative and qualitative information gathered by the project will be compiled and analysed.

**ISSUES ARISING FROM PROGRESS TO DATE**

**Scope of Terms of Reference**

Based on work so far, no change is recommended within the scope of the Terms of Reference. There may need to be some re-arrangement of the sequence of topics within the final reports that are produced, so as to make a more logical progression from topic to topic, and so leading on to recommendations.

By the end of the study it is expected that there will be an extensive bibliography on ecotourism, and tourism and the environment. Appendix II gives a sample of the form a bibliography might take. It may also be possible to provide a directory of the main ecotourism companies currently operating.

**Budgetary Information**

The team hopes to compile some basic information on budgetary allocations that have been requested by the various agencies for tourism and ecotourism-related projects under the next Five Year Plan. It will be useful to have the assistance of the Technical Committee in assessing the amounts, the likelihood of budgetary approval, and breakdown of the tourism related budgets (e.g., how much of a general departmental budget can realistically be expected to go to ecotourism related work, and how much of it to infrastructure, maintenance, detailed plans, within that amount). This is because difficulties of interpretation can arise through Federal and State channels of funding, and because ecotourism projects may not be distinguished from other tourism projects within budgets.

**Coverage of Sites**

It is possible that many hundreds of sites could be listed for ecotourism. For example, there are well over 300 gazetted Forest Reserves, more than 100 caves, more than 100 waterfalls, more than 70 recreational forests, many rivers and islands.

These sites can all be listed by name, with some basic specification of the environment there, attractions, current facilities and status of visitation. Because they cannot all be
visited during this study, it is suggested to include greater detail on specific key sites according to the points made above (Logistics and Methodology), i.e., to illustrate the range of sites with more detailed treatment of some sites that are already well known and well used, developing, undeveloped and over-developed; that show a range of activities; and that are distributed in various parts of the country.

Use of Statistics

A number of statistical analysis techniques are available that could be used in assessments of carrying capacity, visitation rates, economic sustainability of sites, etc. In general we consider that the level (quality and amount) of numerical information available does not justify the use of these techniques. Even if they were to be used, the results would be of minor importance due to difficulties in making comparisons between the wide range of sites and activities. For example, it would not be useful to compare visitor expenditure when scuba diving at Pulau Sipadan with expenditure by day-visitors to Genting Highlands.

We therefore propose to limit the use of statistics, and to relegate these wherever possible to Appendices, so that they will not appear in the main body of reports.

Itineraries

The intention is to identify, where practicable, within-State itineraries, between-State itineraries, and some between-country itineraries. These will naturally be only a selection of the total possible itineraries, involving those considered to have most interest and potential for ecotourism.

These will be based on a degree of specialisation between States and regions in the ecotourism products that are available.

Data Requirements

It is anticipated that most necessary data from the tourism side of the study will be available within existing reports, documents and surveys. The team has made enquiries on the feasibility of conducting surveys amongst departing visitors, and may generate additional material through this technique.

The site assessments, information about slope, water supply and surrounding land characteristics will require the use of topographical maps. Application is being made to the National Mapping Directorate.
CONTENTS, APPROACH AND PROGRESS OF STUDY

A. **Immediate Objective A: Background**

To identify the key categories of ecotourism assets and attractions of Malaysia.

**Output**

An analysis of Malaysia’s key ecotourism assets and attractions (both natural and related cultural), and their relationship to those of the region.

This section will place Malaysia’s ecotourism assets within the context of the Southeast Asian region. The team has already collected a substantial amount of information on (a) tourism statistics; (b) present and future trends on tourist numbers; and (c) ecotourism facilities and assets in the following countries:

Brunei, Cambodia, China, Hong Kong, India, Indonesia, Laos, Pakistan, Philippines, Singapore, Thailand and Vietnam.

Work will continue throughout the study period on information about Malaysia’s ecotourism assets, with the objective of finding complementary assets between countries and identifying Malaysia’s niche within the field. The amount of detail on Malaysia in this section of work will be limited to that which is useful for the purposes of regional comparison. Greater detail will appear in the output from Objective B.

A suggested format for inventorying, categorizing and reporting on the assets and activities of single sites is given in Appendix III.

B. **Immediate Objective B: Analysis**

To obtain a critical analysis and a diagnosis of the present state of ecotourism in Malaysia.

**Output**

A critical analysis and diagnosis of existing tourism and ecotourism activities, services and infrastructure, with special emphasis on socio-economic and environmental impacts, including quantification of economic benefits to the local population.

Work is continuing throughout the study period on information about Malaysia’s tourism policies, activities, services and infrastructure, ecotourism assets, and impacts upon them.
Services are taken to include fields such as accommodation (quality, amount, location), guided tours, diving services, boat rides and other transport. Infrastructure will be taken to include hotels, roads, trails, interpretative centres, rest areas, and other physical facilities such as hides.

C. Immediate Objective C: Planning and Management

To develop an integrated, multi-disciplinary approach to ecotourism development in Malaysia as an effective tool for sustainable development while conserving the natural, cultural, historical and environmental resources utilizing the general framework of Malaysia’s tourism policy and other national policies and strategies.

The approach will include topics such as flora, fauna, islands, beaches and marine locations, and other categories of ecotourism destinations or activities.

Output

A National Ecotourism Plan which emphasizes sustainable development, particularly in rural areas. Some commentary will also be included on the rehabilitation of sites where they have been damaged, used to excess, or used inappropriately.

Material is being collected for a review of the legal framework, historical background, policy considerations, justification and budgetary issues relating to tourism, protected and unprotected areas.

The definition of concepts is being refined, but will require further discussion with the Technical Committee and participants in the industry. If the Plan is to be relevant to the broader development strategy of Malaysia, then a scope for ecotourism must be sufficiently broad to take in most aspects of nature tourism and some of adventure tourism.

A wide range of material is being collected (for instance from Five Year Plans, the National Tourism Policy, and state level planning) to place ecotourism within the overall policy scene.

A summary of State level plans and priorities will be prepared by the collection of information from the Ministry of Culture, Arts and Tourism, the Sarawak Ministry of Tourism and the Sabah Ministry of Tourism and Environmental Development; by discussions with all State Economic Planning Units and State Economic Development Corporations; and by reference to existing written plans and policies.
The establishment of planning horizons will be brought forward, to precede the section on State level plans and priorities. It will attempt to describe short term (1-2 years), medium term (about 5 years) and long term planning horizons (after the year 2000). It will do so by description of scenarios based on differing planning horizons.

The identification of main strategies is a key step in the Plan. This should be a main heading under which come various issues such as mechanisms for participation, consideration for the setting up of a national ecotourism body, a regionalization approach, etc.

The plan will recommend the involvement of all sectors in planning, decision-making and operations. A National Ecotourism Council or similar body is one mechanism by which participation of this sort can be achieved. If such a body is recommended in the final plan, it is likely to differ from the present Malaysian concept of a 'council' as a largely governmental body at cabinet level. The concept of a body whose members pay membership fees is being considered, the fees going to support a full time secretariat which would carry out tasks such as communication between sectors, promotions, information gathering, surveys and technical reporting. The amount of work it performs would make it a high profile body, reliable because of its foundation upon factual data, and thus having a high moral authority rather than mandatory power.

If such a body were to be recommended, it would have to be co-ordinated with existing bodies at regional, State and local level, for example the tourism working group for the East Asia Growth Area (Sarawak, Sabah, Mindanao, Sulawesi), and with district committees.

The existing level of regionalization (mentioned above, plus concepts such as the Northern and Southern Growth Triangles) will be linked to specific ecotourism localities through a hierarchy of areas and itineraries, and will attempt to link protected areas with surrounding lands and local communities.

Marketing and promotional strategies will be suggested at local, national and international level. The emphasis will be on marketing and promotions that have a reliable factual content, creating realistic expectations amongst potential tourists, and accuracy of information at all levels from pricing to logistics to environment, distances and times.

The identification of main ecotourism itineraries and circuits will be brought forward, to precede the section on marketing and promotions, and linked to the regionalization approach. It will include both national and State level itineraries.

There will be a section on monitoring and evaluation of progress in the development of ecotourism, with indications of methods and procedure, how to measure levels and success of ecotourism. This section will draw attention to the shortage of co-ordinated data collection, and link back to the section on consideration for the setting up of a
national body (e.g., a council). Monitoring and evaluation through data collection could be a main function of such a body. The scope of monitoring should include the monitoring of the success of guidelines described below. It should be able to analyse the state of ecotourism, identify strengths and weaknesses, point out where guidelines are successful or unsuccessful, and revise or recommend revision of guidelines.

In addition to the above, and not explicitly stated within the Terms of Reference for the study, main strategies should include (a) manpower availability, training and certification of expertise (for local communities, tour operators, private and public sector, hotels, etc.); (b) low impacts and the minimization of impacts wherever possible through design of physical facilities and infrastructure, making the distinction between mass tourism on one hand and ecotourism on the other hand. (Some preliminary specifications on minimizing impacts are given in Appendix IV). These and the other main strategies mentioned above should be linked wherever possible to technically based guidelines described below.

Draft guidelines are to be prepared on categorization of sites; permitted activities and structures; minimizing impacts; education and training; participation by local communities; economic structures and revenue; and tender-and-bidding assessments. A sample of some preliminary guidelines on responsible design and appropriate architecture are given in Appendix V.

D. **Immediate Objective D: Ecotourism Potential**

To categorize and list sites, so far as their sensitivity allows, with indications of their current and potential importance.

**Output**

Categories and lists of sites in each State that are related to the objectives of ecotourism, with indications of the guidelines that apply to each.

This work is being carried out by a series of site visits covering every State. There are constraints on the availability of maps that limit effective work. Interviews are being conducted that reveal information about sites, their management, potential and problems.

These listings will be sorted according to categories of environment and ecotourism activity, existing and potential significance for ecotourism and need for guidelines. The listings will cross-refer to the categorization of sites from Immediate Objectives A (Background) and B (Analysis), and to the guidelines under Immediate Objective C. Thus each site will be categorized, and the guidelines and criteria that must be applied at that site will be specified. A number of sites have been visited to date.
PRELIMINARY RECOMMENDATIONS

Monitoring and evaluation in implementing the National Ecotourism Plan should begin immediately the Plan is completed in December 1995. In order to do so, a mechanism (even if it is only a temporary one) should be in place beforehand.

It is recommended that:

(1) the National Ecotourism Plan itself should be action oriented, so that the ways of implementing sections of it are clear, duties allocated, etc.

(2) either the Technical Committee or the Steering Committee, or an amalgam of both, should themselves form the core of a pro tem monitoring and evaluation body. They should then invite other interested parties, notably representatives of the private sector, trade/tourguiding associations and NGOs, to form a fuller body and discuss mechanisms for its functioning.

(3) This newly formed body, which could be a National Ecotourism ‘council’, should be in place by December 1995.
APPENDIX I

NATIONAL ECOTOURISM PLAN

TERMS OF REFERENCE
SCHEDULE A

NATIONAL ECOTOURISM PLAN

TERMS OF REFERENCE

1. BACKGROUND

Malaysia is known for its tropical rain forests and its other natural habitats, its wildlife and plants. These are amongst the main attractions for tourists. Some of the natural features are distinct between Peninsular Malaysia, Sabah and Sarawak, for example the presence of orang utans in Sabah and Sarawak gives them a different tourist potential from the Peninsula.

Recent declines in the areas of natural habitats have coincided with an increased interest in nature and the environment amongst the general public worldwide. Tourism, if properly planned and managed, is one of the forces that can be directed towards economic development at the same time that nature is conserved.

Over the past few years, Malaysia has experienced rapid growth in the tourism industry. In 1989 it was the sixth highest earner of foreign exchange, but it was the third highest in 1990, following manufacturing and petroleum.

In 1981 there were 2.5 million foreign tourist arrivals, rising to 4.8 million in 1989 and 7.5 million in 1990. Foreign exchange earnings from tourism increased from RM 2,803 million in 1989 to RM 4,473 million in 1990. It is estimated that less than 1% of the total workforce derived its living directly as a result of tourism in 1990, of whom approximately 48,000 were employed in the hotel sector.

In the future tourism is expected to consolidate its position as one of the country’s main income generators, with a predicted 12 million foreign arrivals in the year 2000. Malaysia possesses an excellent opportunity to develop its tourism without some of the mistakes experienced by other destination countries around the world. The government intends that Malaysia should become one of the major tourist receiving countries in the region over the next decade. It is intended that specific designated areas be developed for tourism, around an enlarged product base to reduce dependence on a narrow range of activities and markets, with linkages between the different elements of tourism proper and with other sectors of the economy. Emphasis will be on activities that have tourism potential for increased employment and incomes, but within a framework of sustainable development and environmental protection and preservation. Specific programmes that increase the participation and economic opportunities of the local communities will be included.

Natural resources are Malaysia’s greatest tourism asset: wildlife sanctuaries, forest reserves, national and state parks, marine parks, etc., together with their enormous wealth of flora and
fauna. These assets have only recently been consciously developed, packaged and promoted for adventure tourism, agrotourism and ecotourism. Because Malaysia does not have the ancient monuments or archaeological sites of other South-east Asian destinations such as Thailand and Indonesia, the natural heritage of the country has to be valued and protected appropriately as the main tourism resource. The only viable way of achieving this is through an ecotourism approach.

Amongst the objectives in promoting and developing ecotourism are:

(a) to generate an efficient tool for conservation and preservation of natural resources;

(b) to diversify national tourism products in order to retain Malaysia’s competitive position as an important tourist destination in South-east Asia;

(c) to encourage participation by local communities in the tourism industry, thereby improving their standard of living; and

(d) to create an appropriate instrument for fostering environmental awareness and education.

At the same time Malaysia has valid concerns over ecotourism, such as the need for a balanced overall profile in the tourism industry, and the need to keep impacts on the environment within limits of acceptable change, that require a plan.

In Malaysia the development of ecotourism products is the function of many government agencies including (but not confined to) the Ministry of Culture, Arts and Tourism (MoCAT), the Department of Wildlife & National Parks, Forestry Department, Fisheries Department, etc., with the collaboration of private sector developers and non-governmental organizations.

There is a clear role for closer Federal-State level co-ordination of ecotourism plans, regional specialization, and investigation of cross-sectoral benefits from ecotourism.

So far, no guidelines have been laid out for a carefully planned and managed development of ecotourism in the country. However, each of the government agencies such as those mentioned above has enactments or regulations that govern the development and administration of their respective activities. Recently a working committee for discussion of agrotourism and ecotourism issues was formed by the Ministry of Culture, Arts and Tourism. A preliminary study has been completed with the involvement of MoCAT, MOSTE, IUCN and WTO, resulting in a report on which these terms of reference are based. The report recommends the preparation of a National Ecotourism Plan.

This is in line with the principles and recommendations set out in the Malaysian National Conservation Strategy.
SCHEDULE A

2. PROJECT JUSTIFICATION

2.1 Problems to be addressed by the Project

Ecotourism as defined by IUCN The World Conservation Union, is "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy, study and appreciate nature (and any accompanying cultural features - both past and present), that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations" (Ceballos-Lascurain, 1993).

It is only recently that ecotourism has emerged as a feasible option for both conserving the natural and cultural heritage of nations and regions, and contributing to sustainable development.

Natural areas, and especially legally protected areas, their landscape, flora and fauna, together with any existing cultural features, constitute major attractions for the peoples of the countries in which they are found and for tourists from around the world.

Ecotourism can bring numerous socio-economic benefits to a country or a locality, in terms of generating foreign exchange, creating local employment, stimulating national and local economies, and fostering international relationships as well as increased environmental awareness and education. But appropriate management structures, as well as adequate planning, design and building guidelines for tourist facilities are required to ensure that tourism enhances rather than detracts from the natural setting. Further, carrying capacity needs to be assessed relative to the management objectives of each area, and appropriate management and physical structures must be designed to keep the numbers of visitors (and the visitation mode) within the carrying capacity.

Inappropriate tourism developments can degrade a prime natural area and have unanticipated effects on the surrounding lands. A balance must be found between visitor enjoyment and the needs of conservation. In all parts of the world the conflict between natural areas, including protected areas, and human needs increasingly involves tourism as well. A major issue is how to ensure that local communities earn an appropriate share of the profits from tourism, while at the same time conserving their natural and cultural heritage.

By its own nature, ecotourism is a complex, intersectoral and multidisciplinary field. In Malaysia, criteria for good and standard practice in this type of tourism have not yet been developed. Education and training in ecotourism, at all levels and in the different sectors of Malaysian society have to occur before a well orchestrated process is set in place.

There are many existing pressures on the rich natural resource base of Malaysia, originating from the need for development of the various sectors of the economy. Ecotourism must therefore offer a valid socio-economic option for conserving the wealth of Malaysia's natural assets.
SCHEDULE A

2.2 Expected situation at the end of the Project

As a result of this project, the Government of Malaysia should have a firm basis for guiding ecotourism development, based on existing tourism activities and their ecotourism potential. This will include a regional analysis of Malaysia's natural and cultural tourism resources within the context of Southeast Asia, and a critical analysis and diagnosis of the present state of ecotourism in the country.

These will accompany an integrated National Ecotourism Plan developed to complement broader Malaysian tourism policies. The Plan will include a general framework and national development priorities in this sector. Where appropriate, administrative mechanisms should be indicated. Quantitative techniques will be applied in particular cases such as carrying capacity and marketing. Management principles, strategies and guidelines for ecotourism in Malaysia will be developed, based upon broad categories of ecotourism destination (e.g., waterfalls, caves, beach) and giving specific design guidelines for each category. These will cover the main physical facilities, emphasizing where appropriate low-impact planning, technology criteria and application of techniques such as solar energy, natural ventilation, recycling of refuse, design and placement of sewerage, and planning for buffer zones, signage, architecture, building materials, and the repair and rehabilitation of sites.

These principles, strategies and guidelines for specific categories of destination will serve as models that can be applied to demonstration sites throughout Peninsular Malaysia, Sabah and Sarawak.

The capacity of government officials and local residents to manage and pursue ecotourism development will be enhanced by guidelines for training in ecotourism activities, as well as guidelines for environmental education and marketing and promotional strategies at local, national and international levels.

2.3 Target Beneficiaries

The primary beneficiaries from implementation of the plan should be the policy makers, managers, Parks personnel, non-governmental organizations and community development groups, and the private sector who will have a firmer basis for making environmentally sound decisions in the development of the tourism industry. There should be closer integration of State level ecotourism initiatives, and Federal-State co-ordination.

Malaysia's tourism thrust aims to improve the socio-economic benefits for the communities which surround the main tourism sites, increasing employment opportunities, recreational facilities and local transportation networks. Therefore, the entire population of Malaysia will benefit from the more sustainable use of the country's natural resources in this way. Special beneficiaries from implementation of the plan should be the local communities living near the main ecotourism areas, who should gain from permanent employment in the ecotourism industry,
SCHEDULE A

for example as guides and maintenance personnel. Properly managed ecotourism will also raise the amount of foreign currency flowing into the country from the tourism industry, without destroying the resource base.

2.4 Project Strategy and Institutional Arrangements

The project strategy is based on the need for an integrated, multi-disciplinary approach to the development of eco-tourism. The project will be co-ordinated nationally by the Ministry of Culture, Arts and Tourism (MoCAT), which has overall responsibility for the government’s role in tourism. The national counterpart agency will be the Department of Wildlife and National Parks (DWNP) in the Ministry of Science, Technology and the Environment (MOSTE). Both agencies will work in accordance with national policies established by the Economic Planning Unit.

The Ministry of Culture, Arts and Tourism will appoint the members of a Steering Committee and a Technical Committee to oversee and facilitate the project.

The project will be carried out by the World Wide Fund for Nature Malaysia (WWF Malaysia) which may sub-contract out consultancies as required.

2.5 Counterparts

Desk officers will be available on an ‘on-call’ basis within the Ministry of Culture, Arts and Tourism, and the Department of Wildlife and National Parks.

3. OBJECTIVES OF THE PROJECT

3.1 Development Objective

It is an objective of the project to assist the Government of Malaysia at Federal and State level in the development of Malaysia’s ecotourism potential, through the setting up of a National Ecotourism Plan, which will serve both as an effective tool for conservation of the natural and cultural heritage of the country and as an appropriate instrument within the overall sustainable development of Malaysia and the economy as a whole.

3.2 Immediate Objectives, Outputs and Activities

A. Immediate Objective A: Background

To identify the key categories of ecotourism assets and attractions of Malaysia.
SCHEDULE A

Output

An analysis of Malaysia’s key ecotourism assets and attractions (both natural and related cultural), and their relationship to those of the region.

Activities

A(a) Regional analysis of Malaysia’s natural and related cultural tourism resources within the context of Southeast Asia.

A(b) Analytical description of physical and ecological features of Malaysia, with special emphasis on the ecotourism attraction potential of these features.

A(c) Analytical description of the cultural and historical features of Malaysia as they relate to natural features, and their potential for ecotourism development.

B. Immediate Objective B: Analysis

To obtain a critical analysis and a diagnosis of the present state of ecotourism in Malaysia.

Output

A critical analysis and diagnosis of existing tourism and ecotourism activities, services and infrastructure with special emphasis on socio-economic and environmental impacts, including quantification of economic benefits to the local population.

Activities

B(a) Analysis of the present situation of tourism and ecotourism policies, activities, services and infrastructure.

B(b) Analysis of the environmental impacts of tourism and ecotourism activities in the country, especially in natural areas (including legally protected areas).

B(c) Analysis of the socio-economic impacts of tourism and ecotourism activities in the country, especially as regards socio-economic involvement and benefits and drawbacks to local inhabitants.
C. **Immediate Objective C: Planning and Management**

To develop an integrated, multi-disciplinary approach to ecotourism development in Malaysia as an effective tool for sustainable development while conserving the natural, cultural, historical and environmental resources utilizing the general framework of Malaysia’s tourism policy and other national policies and strategies.

The approach will include topics such as flora, fauna, islands, beaches and marine locations, and other categories of ecotourism destinations or activities.

**Output**

A National Ecotourism Plan which emphasizes sustainable development, particularly in rural areas. Some commentary will also be included on the rehabilitation of sites where they have been damaged, used to excess, or used inappropriately.

**Activities**

C(a) Preparation of an overall draft country plan including:

- Legal framework, historical background, policy considerations, justification and budgetary issues of tourism and protected areas;

- Definition of relevant concepts related to sustainable tourism, ecotourism and protected areas;

- Interface of ecotourism issues with Malaysia’s tourism policy and national planning strategies;

- Summary of State level plans and priorities;

- Establishment of planning horizons;

- Identification of main strategies;

- Mechanisms for active and effective intersectoral participation by government, private sector, local communities and NGOs;

- Consideration for the setting up of a National Ecotourism Council or other body including representatives of the above sectors;

- A regionalization approach that includes a hierarchy of areas and links natural areas (including legally protected areas) with surrounding lands;
SCHEDULE A

Marketing and promotional strategies at local, national and international level;

Identification and setting of main ecotourism itineraries and circuits at the national level;

Monitoring and evaluation of progress in the development of ecotourism, with indications of methods and procedure, how to measure levels and success of ecotourism.

C(b) Preparation of draft guidelines including:

Guidelines for categorizing existing and potential ecotourism sites and itineraries;

Guidelines for each category regarding permitted activities, physical planning and architectural design of facilities for ecotourism (including accommodation, food, camping sites, interpretative centres, nature trails, signs, observation facilities, related recreational facilities, energy, ventilation, waste and sewage disposal);

Guidelines for controlling and minimizing negative environmental and cultural impacts, based on concepts of carrying capacity and limits of acceptable change;

Guidelines for environmental education, and for ecotourism guide training as aspects of visitor servicing; potential code of ethics for guides and/or other sectors of ecotourism industry;

Guidelines for fostering active participation by local communities in the process, and ensuring economic spillover amongst them;

Guidelines for ensuring that a relevant part of tourism revenue is applied to the maintenance and conservation of areas, including establishment of differential fee structures, concessions, fundraising activities, donations, joint ventures, voluntary support groups, and assessing the potential for government involvement and privatisation, etc.

Guidelines for assessing bid process for construction and management of ecotourism areas or facilities.
SCHEDULE A

D. Immediate Objective D: Ecotourism Potential

To categorize and list sites, so far as their sensitivity allows, with indications of their current and potential importance.

Output

Categories and lists of sites in each State that are related to the objectives of ecotourism, with indications of the guidelines that apply to each.

Activities

D(a) Survey every State's resources from the view of current and potential ecotourism, by a combination of site visits, interviews and compilation.

D(b) Sort the listings of sites according to their local and regional significance, ecotourism potential, and their need for strict guidelines and controls on development.

4. REPORTS AND ASSOCIATED OUTPUTS

4.1. WWF Malaysia shall prepare and submit copies of the following reports in the indicated quantities:

a) an inception report, in English, within three months of the commencement of the project (50 copies);

b) a draft final report, in English, containing the outputs from the four immediate objectives described above, nine months after commencement of the project (50 copies);

c) a final report, in English with a summary in Bahasa Malaysia, within 12 months of the commencement of the project (500 copies)

These reports will follow the normal procedure of submission for comment, feedback and improvement before preparation of the final report.

The final report shall include colour charts, graphics, maps and photographs as may be appropriate to convey the information in a useful and informative way.

4.2 WWF Malaysia shall submit to the Ministry of Culture, Arts and Tourism colour transparencies, taken during the course of the study, that show a variety of sites, the attractions to be found there, and examples of tourism developments.
SCHEDULE A

4.3 WWF Malaysia shall provide the resource materials for a workshop, and participate in the organisation and execution of the workshop, at the end of the study so as to disseminate information to State authorities and Local Authorities.

5. DATA AND FACILITIES

The Ministry of Culture, Arts and Tourism will assist WWFM to ask all State and Federal departments and other agencies to co-operate and promptly to provide WWFM upon request all available information, data, maps, plans and policy decisions related directly or indirectly to the project.

The study will make use of/cross-refer to the existing and ongoing studies or activities relating to ecotourism, such as State and local Master Plans, tourism plans, and site-specific plans from other ministries, departments, or economic planning units.

6. STEERING COMMITTEE

The overall supervision of the project will be by a Steering Committee that will include the following agencies:

(a) Chair Deputy Secretary-General, Ministry of Culture, Arts and Tourism
(b) Secretariat Tourism Section, Ministry of Culture, Arts and Tourism
(c) Members Department of Wildlife & National Parks
Department of Forestry
Economic Planning Unit
Malaysian Tourism Promotion Board
Ministry of Agriculture
Ministry of Public Enterprise
Ministry of Environment & Tourism, Sarawak
Ministry of Tourism & Environmental Development, Sabah
The Consultants
(d) Invited members State Economic Planning Unit, Johor
State Economic Planning Unit, Pahang
State Economic Planning Unit, Perlis
Dept. of Aboriginal Affairs
SCHEDULE A

7. TECHNICAL COMMITTEE

The Steering Committee will be assisted by a Technical Committee, in order to maximize technical inputs from governmental and non-governmental sources, at Federal and State levels. The functions of this committee will include providing technical guidance to the study team, facilitating appropriate technical inputs from Government departments, universities and research institutions, and critically reviewing draft materials emanating from the project.

The membership of the Technical Committee shall include:

(a) Chair
   Director-General, Department of Wildlife and National Parks

(b) Secretariat
   Department of Wildlife & National Parks

(c) Members
   Department of Fisheries
   Department of Forestry, Peninsular Malaysia
   Department of Wildlife, Sabah
   Forest Research Institute Malaysia
   Johor National Parks Corporation
   National Parks & Wildlife Office, Sarawak
   Sabah Parks
   Tourism Section, Ministry of Culture, Arts and Tourism

(d) Invited members
   State Economic Planning Units of relevant states
   Department of Agriculture
   Department of Irrigation & Drainage
   Malaysian Association of Tour & Travel Agents
   Malaysian Fisheries Development Board (LKIM)
   Malaysian Tourist Guides Association
   National Parks Corporation Johor
   National Parks Corporation Pahang

8. PROJECT PERIOD

The project will be carried out over a period of twelve months. The project shall commence on:

16th December 1994

and will be completed on:

15th December 1995
SCHEDULE B-1

ORGANISATION CHART

(a) Organisational structure of WWF Malaysia

Patron
President
Chairman
Board of Trustees
Executive Director

Directorate Fundraising CONSERVATION Education Admin.
Department Department DEPARTMENT Department Dept.

(b) Organisational structure of project team

STEERING COMMITTEE

TECHNICAL COMMITTEE

Team Leader
Dr Isabelle Louis
Director of Conservation
Projects Administrator

Peninsular Malaysia team East Malaysian team

Dr Geoffrey Davison Dr Junaidi Payne
1 Scientific Officer 1 Scientific Officer
1 Secretary 1 Secretary

Consultancies
Arq. H. Ceballos-Lascurain
Local sub-consultancies
SCHEDULE B-2

NATIONAL ECOTOURISM PLAN

PROPOSED IMPLEMENTATION SCHEDULE

The timing of the main activities shall be approximately as follows:

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It is intended that the Draft Final Report shall be available in time for the incorporation of material into the Seventh Malaysia Plan, and that the Final Report will be submitted prior to the formal approval of the Seventh Malaysia Plan.
## SCHEDULE C

### NATIONAL ECOTOURISM PLAN

#### STAFF TIME INPUT BAR CHART

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*Staff concerned:

1. Dr Isabelle Louis, Director of Conservation, WWF Malaysia
2a. Dr Geoffrey Davison, Project Director, WWF Malaysia (Peninsular Malaysia)
2b. Dr Junaidi Payne, Project Director, WWF Malaysia (Sabah)
3a. Scientific Officer, to be determined (Peninsular M’sia)
3b. Scientific Officer, to be determined (East Malaysia)
4a. Projects Administrator (Peninsular Malaysia)
4b. Secretary, to be determined (Peninsular Malaysia)
SCHEDULE C

4c. Secretary, to be determined (East Malaysia)

5a. Arq. H. Ceballos-Lascurain (overseas IUCN Consultant)

5b and 5c. Sub-consultancies within Malaysia

5d. Scientific trainee, Elly Lina (Sarawak)
SCHEDULE C

PROJECT PERSONNEL

1) **WWFM Director of Conservation** (part time)

Dr Isabelle Louis (3 person months at a rate of one week per month during the 12-month study)
Director of Conservation
WWF Malaysia

The Director of Conservation will give overall guidance and supervision amounting to three months input spread over the duration of the project. She has qualifications in botany and soil microbiology/pathology, has taken part in preparation of the Sabah Conservation Strategy, and has worked on a variety of conservation issues.

2) **Team Co-ordinators**

(a) **Dr Geoffrey Davison** (Peninsular Malaysia: 12 man months full time)
Project Director
WWF Malaysia

Dr Davison will bear responsibility for the supervision, direction, and completion of work programme in Peninsular Malaysia. He will manage fulfillment of the four immediate project objectives from design through to final reporting. He will bear joint responsibility for the quality and content of the final project outputs. He has worked on biology and environmental issues in Malaysia since 1974, as a university lecturer and with WWF Malaysia.

(b) **Dr Jurnai Di Payne** (East Malaysia: 8 man months, during months 5 to 12 of the project period)
Project Director
WWF Malaysia

Dr Payne will bear responsibility for the supervision, direction and completion of work programme in Sabah and Sarawak. He will manage fulfillment of the four immediate project objectives from design through to final reporting. He will bear joint responsibility for the quality and content of the final project outputs. He has worked on biology, land management, wildlife and related conservation issues since 1975.
SCHEDULE C

3) Research assistants

(a) Scientific Officer (Peninsular Malaysia: 12 person months full time)

(b) Scientific Officer (East Malaysia: 12 person months full time)

To be appointed

4) Secretarial assistance

(a) Projects Administrator (Peninsular Malaysia: 2 person months input from time to time during project duration)

(b) Secretary (Peninsular Malaysia: 6 person months)

(c) Secretary (East Malaysia: 6 person months)

In addition WWF Malaysia will call upon the expertise of existing staff at various project locations to provide their input to the study. These will include 5d, Elly Lina, Scientific Trainee in Sarawak. Such staff will not draw any salary or fees from the project budget, but may be reimbursed for expenditure incurred in working on the project.
TECHNICAL DESCRIPTION

Staff responsibilities and functions

1. Dr Isabelle Louis

Time input 3 person-months, averaging one week per month spread over the entire project period.

Overall project supervision and guidance.

Receipt and checking of progress reports, ensuring timely output and completion of work, quality control.

Staff recruiting, arrangements, working conditions.

Attendance at Steering and Technical Committee meetings.

2a. Dr Geoffrey Davison

Time input 12 months, full time.

Supervision, direction and completion of work programme in Peninsular Malaysia.

Manage fulfillment of four immediate project objectives, from design through to final reporting.

Attendance at Steering and Technical Committee meetings.

Site visits throughout Peninsular Malaysia.

Meetings with State-level officials in tourism and ecotourism development fields.

Compilation of materials for inception, draft final and final reports.

Analysis and report writing.

2b. Dr Junaidi Payne

Time input 8 months, full time.
Supervision, direction and completion of work programme in Sabah and Sarawak.

Manage fulfillment of four immediate project objectives, from design through to final reporting.

Attendance at Steering and Technical Committee meetings.

Site visits throughout Sabah.

Meetings with State-level officials in tourism and ecotourism development fields.

Compilation of materials for inception, draft final and final reports.

Analysis and report writing.

3a. **Scientific Officer, Peninsular Malaysia**

Time input 12 months, full time

Gathering of literature, reports, technical papers.

Site visits throughout Peninsular Malaysia.

Compilation of descriptive and quantitative data, maps, photographic record.

Analysis of data.

Report writing.

3b. **Scientific Officer, Sabah**

Time input 12 months, full time.

Gathering of literature, reports, technical papers.

Site visits throughout Sabah and Sarawak.

Compilation of descriptive and quantitative data, maps, photographic record.

Analysis of data.

Report writing.
Supervision, direction and completion of work programme in Sabah and Sarawak.

Manage fulfillment of four immediate project objectives, from design through to final reporting.

Attendance at Steering and Technical Committee meetings.

Site visits throughout Sabah.

Meetings with State-level officials in tourism and ecotourism development fields.

Compilation of materials for inception, draft final and final reports.

Analysis and report writing.

3a. **Scientific Officer, Peninsular Malaysia**

Time input 12 months, full time

Gathering of literature, reports, technical papers.

Site visits throughout Peninsular Malaysia.

Compilation of descriptive and quantitative data, maps, photographic record.

Analysis of data.

Report writing.

3b. **Scientific Officer, Sabah**

Time input 12 months, full time.

Gathering of literature, reports, technical papers.

Site visits throughout Sabah and Sarawak.

Compilation of descriptive and quantitative data, maps, photographic record.

Analysis of data.

Report writing.
4a. **Projects Administrator**

Time input: 2 months, amounting to 5 days per month spread over the full project period.

Administration of budget and claims.

Financial reporting, compilation of receipts and invoices.

Compilation of progress reports.

4b. **Secretary, Peninsular Malaysia**

Time input: 6 months

Typing of draft final and final reports, bookings, general secretarial duties.

4c. **Secretary, Sabah**

Time input: 6 months

Typing of draft final and final reports, bookings, general secretarial duties.

**Project structure and operations**

The study will be carried out by two teams as described in Schedule B-1. One team will be based in Peninsular Malaysia and will consist of a team leader, scientific officer and secretary. The other team will be based in Sabah and will have the same structure. The two teams will be guided and supervised by the Director of Conservation, based in Peninsular Malaysia.

**Months 1-6**

Each team will carry out surveys of existing ecotourism assets in Malaysia, and their relationship with similar assets in Southeast Asia. They will describe and analyse the physical and ecological features of each area, as they influence ecotourism and its potential. They will describe and analyse such cultural and historical features as relate to ecotourism.

The two teams will together prepare an Inception Report, for presentation in Month 3.
Each team will compile qualitative and quantitative information on the present situation of tourism and ecotourism activities, through a combination of literature search, consultation of reports, site visits, discussions and analysis. They will consider positive and negative impacts of ecotourism on the environment, and on socio-economics locally as well as in the State and national context.

Each team will consider the legal framework, historical background, policy considerations, justification and broad budgetary issues in the three regions of the country (Peninsular Malaysia, Sabah, Sarawak). They will consider and define the scope of concepts relevant to sustainable tourism, ecotourism, and protected areas.

Each team will summarize plans and priorities in ecotourism at State level. They will attempt to establish planning horizons and the limits of acceptable change (LAC), and identify the main strategies needed to ensure that ecotourism is sustainable if these planning horizons are reached. They will identify the main strategies required in order to achieve these objectives.

Each team will consider the mechanisms for active and effective intersectoral participation by government, the private sector, local communities and NGOs, through discussions with each group. They will consider the planning and management structure needed to administer an ecotourism plan.

Based on site visits to a range of different existing and potential ecotourism assets and attractions, the two teams will jointly consider a regionalization approach that links the use of natural areas with surrounding land use, and which pays due attention to the different types of ecotourism assets in Peninsular Malaysia, Sabah and Sarawak.

Each of the teams, based on site visits, meetings and discussions, will identify opportunities for ecotourism itineraries within and between regions.

Month 2

The IUCN ecotourism consultant will visit to set guiding principles behind the National Ecotourism Plan, to strengthen the framework for project execution and the outlines of the proposed plan.

Month 4

A consultant will be employed to describe and analyse the economic potential and drawbacks of ecotourism activities, with a consideration of cost-benefit analysis.
Month 6-7

A consultant will be employed to describe and analyse marketing and promotional strategies, the role of privatisation in the operation and promotion of ecotourism facilities, and the opportunities for increasing market share within this field.

Month 6-9

Based on accumulated experience from site visits in each region, the two teams will prepare draft guidelines on:

- how to categorize existing and potential sites;
- permitted activities, physical planning and architecture, infrastructure, etc;
- mitigation of environmental and cultural impacts;
- environmental education, awareness and training, including guide training, codes of ethics, for visitors and for operators of ecotourism sites;
- participation by local communities, and economic spill-over;
- economic structuring; and
- assessment of bids.

Each team will categorize and list sites, so far as their sensitivity allows, based on site visits, meetings and discussions, together with an assessment of their need for implementation of guidelines.

The two teams will prepare a draft final report incorporating all of the above material.

Month 8

The IUCN ecotourism consultant will visit to monitor adherence to framework, provide inputs on report contents, discuss and contribute to guidelines governing site categorization, permitted activities, mitigation, etc.

Month 10-12

Each team will revise the above material, based on supplementary and repeat site visits, testing of guidelines, and on feedback from the draft final report.
The two teams will prepare the final report.

The teams will compile and index pictorial material, including slides and maps for receipt by the Ministry of Culture, Arts and Tourism.

The two teams will provide the resource materials for a workshop in Month 12, and participate in the organisation and execution of the workshop.
APPENDIX II

SAMPLE BIBLIOGRAPHY

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APPENDIX III

SUGGESTED FORMAT FOR COMPILATION OF INVENTORY DATA ON AN ECOTOURISM SITE

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A very important task in developing ecotourism in a defined area is conducting a detailed inventory of the ecotourism attractions found in the area. An inventory can be prepared for each site, and the National Ecotourism Plan will suggest a framework for such an inventory. The inventory must be as complete and detailed as possible, but it should not be understood as an exhaustive, scientific list of all the species of plants and animals that the area has, or as a complete catalogue of ruins of buildings and other cultural artifacts in the case of an archeological site. Rather, the inventory must be seen as a description of those features of the park or area that constitute the main attractions to tourists. Attractions in natural areas (either legally protected or not) may be divided into three main categories: flagship or core attractions (which always refer to the main natural and/or cultural heritage features that are found in a given area, e.g., orangutans in the Sepilok Forest Reserve, proboscis monkeys in the Lower Kinabatangan River, the landform features of Gunung Kinabalu in Kinabalu Park, the gigantic Deer Cave entrance in Mulu Park); secondary attractions (not as important as the previous category, but also referring to natural and cultural heritage features, e.g., hornbills in the Kinabatangan River, orchids in Kinabalu Park, etc.); and supporting attractions (which are of a complementary or supplementary nature and include physical infrastructure and facilities for tourists, e.g., tourist accommodation in Taman Negara, tourist centre in Kinabalu Park, boat rides to Pulau Pinang, etc.). The language used in preparing inventories should be simple (easily understood by the layman) and not overly technical or scientific.

The following is an outline format which at this stage we consider should prove useful in preparing an inventory of ecotourism attractions:

1. Name and protected category (if any) of the site
2. Geographical location (including a location sketch, latitude, longitude, altitude above sea level)
3. Extent of park or site (area in hectares)
4. Means of access and entry points
5. Internal circulation
   5.1 Vehicular roads and parking areas
   5.2 Pedestrian walks, paths, and trails
5.3 Bicyclic or ORV (off-road vehicles) routes
5.4 Water routes

6. Brief description of overall visual resources
6.1 Basic terrain variety: abrupt topography, moderate slopes, practically flat, etc.
6.2 Variety of geomorphological features: jagged peaks, rounded hills, mountains, cliffs, ravines, caves, etc.
6.3 Variety of hydrological features: sea, rivers, beaches, lakes, lagoons, reservoirs, waterfalls, hot springs, etc.
6.4 Variety of vegetational patterns: highly or moderately varied, practically uniform
6.5 Effects of land uses (lack or presence of discordant visual elements: buildings, utility lines, deforested areas, highways, etc.)

7. Climate patterns
7.1 Temperature
7.2 Precipitation (rain)
7.3 Winds (speed, direction)
7.4 Humidity
7.5 Air pressure
7.6 Cloudiness

8. Comfort indexes: hot, warm, fresh, cool, cold, extremely cold, humid, dry

9. Natural attractions
9.1 Geological/geomorphological features
  9.1.1 Mountains
  9.1.2 Inter-montane valleys, basins, or plains
  9.1.3 Ravines etc.
  9.1.4 Cliffs (limestone, sandstone, bluffs, etc.)
  9.1.5 Boulders, balancing rocks, etc.
  9.1.6 Caves, grottoes, etc.
  9.1.7 Sand dunes, sandbanks, etc.
  9.1.8 Fossils
  9.1.9 Islands
  9.1.10 Coral reefs
  9.1.11 Capes, peninsulas, points
  9.1.12 Bays, inlets, coves, straits, etc.
  9.1.13 Beaches

9.1 Hydrological resources
  9.1.1 Ocean waters
  9.1.2 Rivers, streams, underwater currents, etc.
  9.1.3 Lakes, ponds, reservoirs, etc.
  9.1.4 Estuarine waters (freshwater, brackish, coastal lagoons, wetlands, etc.)
  9.1.5 Springs (hot, cold, sulphurous, etc.)
  9.1.6 Waterfalls
9.2 Biological resources
   9.2.1 Flora
       9.2.1.1 Main vegetation types: lowland, hill or montane
               rainforest, peatswamp forest, mangroves, etc.
       9.2.1.2 Flagship species (most interesting, rarest, most
               beautiful, most characteristic of the area, etc.)
       9.2.1.3 Specific individual trees (with exact location)
   9.2.2 Fauna (species checklists, singling out flagship species)
       9.2.2.1 Insects
       9.2.2.3 Fishes
       9.2.2.4 Reptiles and amphibians
       9.2.2.5 Birds
       9.2.2.6 Mammals

10. Cultural heritage attractions
    10.1 Archeological features
    10.2 Local folklore: ethnic groups, villages, architecture, dress, marketplace,
               food, dance and music, handicrafts, traditions, ceremonies, etc.
    10.3 Historical and architectural landmarks

11. Support attractions and tourism physical facilities
    11.1 Interpretative facilities: visitor centre, nature trails, guided walks,
        observation towers, hides, etc.
    11.2 Accommodation, eating facilities, souvenir shop, boat rides, horse riding,
        scuba diving gear rental, etc.
APPENDIX IV

MINIMIZATION OF IMPACTS THROUGH

DESIGN CRITERIA FOR ECOTOURISM FACILITIES

The following criteria may be useful when designing or physically planning facilities for tourism in or near protected areas. Much of the material in this section has been taken from Andersen (1992); Bachman (1967); Beamiss et al (1987); Berkebile (1992); Ceballos-Lascuráin (1984, 1986, 1990); Christiansen (1977); Curiel (1992); FAO (1984); MacKinnon et al (1986); Manly (1977); McNeely, Thorsell and Ceballos-Lascuráin (1992); Patten (1992); Richman (1991); Selengut (1992); and Thorsell (1984).

a) Zoning

Once boundaries of a protected area have been set, a system of evaluating and classifying land and water areas - what is known as zoning - becomes necessary. Zoning is the process of applying different management objectives and regulations to different parts or zones of a protected area. This basic step of establishing management zones is taken to provide proper recognition and protection for park resources and greatly facilitates their proper administration, including tourism aspects. As a tool for resource management, zoning will indicate where physical development can take place and, even more important, where it cannot be located. The zones proposed for each protected area must be consistent with the objectives for which the area was established, but in general a protected area can be divided into zones of strict protection (sometimes called "sanctuary zone" - where people are excluded), wilderness zone (where a limited number of visitors are permitted only on foot), tourism or visitor use zone (where visitors are encouraged in various compatible ways), and development zone (where facilities are concentrated).

Tourism zones should contain representative samples of the park’s important resources available for visitor appreciation. Such zones are sometimes divided into two types: extensive use (where park infrastructure, such as roads, trails, simple camp grounds and vista clearing, is permitted for low density recreational use) and intensive use (where relatively high concentrations of visitors are expected). The latter type, usually comprising a small percentage of the park’s area, will contain most of the park’s visitor services, such as paved roads, visitor centre, visitor supply store, formal camp grounds and overnight accommodations (if present). Because of the high density of use given to these zones, these are the lands most affected by visitor use and must therefore receive a high degree of management attention. Caution must be exercised to prohibit development either in kind or in degree that will hint at urbanisation. The protected area authority should establish standards for tourism developments in the tourism zones such that the attractions of the protected area are enhanced. This will usually require that facilities placed in this zone be the minimum required to promote visitor enjoyment and safety, as well as resource protection. When possible, hotels, restaurants, and stores should be located outside the park boundaries so as to reduce human impact upon the protected area.
In the case of biosphere reserves, zoning includes two basic categories: core zone (where uses are strictly controlled and no development is permitted) and buffer zone (where management is aimed at reducing the friction between neighbouring incompatible land-uses, such as strict nature conservation and agricultural settlement, and in which various types of harvesting may be permitted, e.g. firewood collection, sport hunting, and production of plant materials). An essential feature of a buffer zone, according to Unesco’s Programme on Man and the Biosphere (MAB, 1974), and one which may well serve as justification of a reserve to land management agencies, is the provision of areas for educational programmes, tourism and other purposes designed to foster appreciation of the biome.

b) Site plans

The following general principles and hints may be useful in making and evaluating site plans for ecotourism facilities:

- All elements of the site plan must have a purpose (relation of park to surroundings, relation of facility to use area and zones, relation of facilities in the site, relation to overall objectives of park master plan). Eliminate superfluous elements. Satisfy both form and function. Provide facilities suited to the function of the place, the scale of the place, and the personalities of the users.

- Man-made structures should interfere as little as possible with the natural ecosystem. Site buildings and structures to avoid cutting significant trees and to minimise disruption of other natural features. Maintenance of ecosystem should take priority over view or dramatic "design statements". Where feasible, locate facilities on perimeters. Examples of bad siting include roads that block the flow of streams and thereby cause erosion on hillsides, structures which frighten wildlife from waterholes, and effluent drains that pollute natural waterways.

Structures must be as unobtrusive as possible, not dominating their natural surroundings nor detracting from the intrinsic natural values of the area. To attain this, use landscaping appropriately. Architecture should preferably be of local style. Buildings should blend with their surroundings and, if possible, should be screened by natural bluffs or groves of trees. If a visitor's lodge is sited on a ridge with a commanding view over the whole area, the building will be visible from many angles. However, if it is sited below the horizon and is single-storeyed and sombrely coloured, it will be far less obtrusive.

- Design for people. Recognize the optimal sociological use-limits of the site, as well as safety and convenience factors. Suitable siting of buildings depends on functional considerations; it is not enough to consider only their strategic aspects. For example, guards will not inhabit posts unless they are serviced by reasonable access and water is available. Before buildings are sited, thought should be given to their accessibility and user flow. Tourist facilities should be separated from the administrative and workshop areas of a park headquarters if the two aspects are not to interfere with each other. Use the facility as a positive control in directing use; allow only day-use facilities in some
areas. Ensure efficient and safe operating use. Discourage undesirable uses.

Design within the constraints of the resource. Recognise the optimal environmental capacity of the site and potential impacts. Balance economic, human, technical and resource values. Recognise technical requirements (size, quantity, standards, orientation to weather and sun, convenience of access, utility costs). Where possible design for year-round use. Study the long-term implications of providing facilities, such as changing demands and technology, and continuing maintenance. If budgets are limited, start with simple but well-built camps of bamboo, thatch, etc., which can perhaps be replaced with more permanent structures later.

The size and capacity of park facilities are determined based on limiting factors such as space, water and energy availability, ecological vulnerability of area, access, and general site conditions including visual compatibility. A facility is considered sustainable when it does not exceed the "budget" of any of these limiting factors. A subjective evaluation, or "feel", must also be applied in determining development size and capacity. For example, care must be taken not to cause a natural landscape to take an urban character or a cultural landscape to lose its sense of place in the historical context.

Scientists, designers and manufacturers have developed technologies to address a variety of conservation needs. These technologies permit substantial flexibility when determining facility size and capacity. Water and energy conservation and waste treatment technologies can significantly reduce the stress on a site, lower operating costs, and thereby increase site capacity.

Site configuration determines the use patterns in an area and the sequence in which park features are presented to visitors. Patterns that include vehicle movement require major investments in infrastructure such as roads and bridges. Dispersed developments require separate utility systems and have greater maintenance and operational costs than consolidated ones. Configurations that promote sustainability are clustered, with all major facilities located within a half mile of one another and organized to share roads, trails, utilities, and other infrastructure. Walking, biking, rowboating and other energy-efficient forms of transport should be the primary modes of movement. The sequence of information and interpretation is arranged to minimize duplication, conflict and the need to retrace one's path.

Wherever possible conserve old, traditional buildings (many of which may have fallen into disuse as a result of changes in management practices), restoring them and converting them to ecotourism facilities, etc.). Such buildings, due to lack of funds and maintenance, may otherwise crumble into ruins. When no other means for preservation is practical, sympathetic conversion should be encouraged. This can provide very attractive and appropriate facilities, in harmony with their context.

In areas that contain an important historical context, it is very important to respect old existing boundaries, such as walls and hedges (which constitute very attractive landscape features).
c) Architectural shape and building technology

- Provide an architecture consistent with environmental philosophies and scientific principles, instead of recurring to sophisticated technologies and superfluous gadgetry. Avoid contradictions! Small is beautiful. Use "low tech" design solutions wherever possible. Design of buildings should utilize, as much as possible, local architectural shapes, construction techniques, materials and cultural images, wherever that approach is environmentally sound. Provide building forms and images in harmony with the natural environment. Design buildings on long-term environmental standards and not necessarily on short-term material standards. Construction specifications should reflect environmental concerns regarding use of wood products and other building materials.

- Building practices should respect local cultural standards and morals.

Involvement of local inhabitants should be encouraged to provide input for the designer, as well as local jobs and a sense of ownership and acceptance by local residents. Facilities should take advantage of local materials, local craftsmen and artists wherever possible.

- Natural cross-ventilation (and the appropriate orientation needed to enhance it) should be generally encouraged, avoiding air-conditioning, which is high-energy-consumptive, noisy, and unhealthy. Landscape elements should be placed to enhance natural ventilation of facilities to avoid unnecessary consumption of energy. If local temperature conditions are unbearably high, fan ceilings are a better option than air-conditioning.

- "Bioclimatic" design criteria, which contemplate aspects of orientation, dominant winds, shading, natural insolation, etc., should be applied to produce solutions such as natural "cold" rooms for the conservation of food items at low temperatures not below the freezing point, convective air movements inside the dwelling (through the use of air scoops, passive air turbines, airvents and ducts), greenhouses, "Trombe" walls, etc. Design should reflect seasonal variations such as rainy or dry seasons and solar angles. Overhangs, louvers and lattices should be imaginatively used in design. Insulate windows and doors to reduce cooling or heat loss in highlands, and provide shades, drapes, shutters or awnings to control excess heat in the lowlands.

- Energy efficiency is a major consideration in the design of ecotourism facilities; thus, solar orientation is critical to sustainable development. Protection from cooling winds in montane areas, energy storage through building materials and massing, creation of passive solar collectors, and planting of seasonal vegetation are part of a sustainable building standard. Designers also strive to use locally available materials, wood from managed forests, and recycled and non-toxic materials in their designs. In most tropical or subtropical areas, due to the high solar angle, it is very appropriate to encourage the use of solar energy. Flat-plate solar collectors to heat water, combined with thermally-insulated tanks (for storing hot water), are unexpensive and highly efficient. In isolated areas, far from traditional electricity supply, the use of photovoltaic cells for converting
solar energy into electric energy presents a valid option ("clean" energy versus other solutions such as diesel plants). Air-to-air exchangers, greywater heat reclamation, and geothermal storage and supply are other technologies used for energy conservation. It is wise to install more efficient low-wattage incandescent or fluorescent light bulbs (if available, install sensors which turn lights off automatically when rooms are empty).

Sustainable development in most protected areas requires water conservation and wise use of this resource. In arid areas water can be a real limitation on visitor use. Even in parks where water is not in short supply, care must be taken to minimize the amounts withdrawn from the watersheds that support native plant and animal species. It is very important, especially in isolated areas, to catch and recycle rain water, as well as stream water (small reservoirs - that will not substantially alter the natural flow - can be created). Low-flow toilets and those requiring no water, special showerheads and faucets and other water-saving technologies and practices (including greywater use) can reduce consumption by as much as one-half the per capita rate for a development. Even putting a brick in an ordinary toilet tank to displace and save water is a good option.

The use of materials and building components which are easily available locally and in which the manufacturing processes imply a low energy cost should be stimulated. Do not use construction materials made from harmful chemistry such as formaldehyde or arsenic. Stay abreast of newer, safer building materials, especially those which used recycled products - or (in certain contexts) play it safe and stick to time-proven traditional materials. Do not use Halom fire extinguishers because of their damaging effect on the ozone layer.

All building materials such as timber should be from well managed operations.

Buildings should be spaced to allow for wildlife travel patterns and forest growth. Site lighting should be limited and controlled to avoid disruption of wildlife diurnal and nocturnal cycles. Continue to plant trees for cooling, landscaping, soil erosion control and to provide natural homes for birds, lizards, frogs and other wildlife.

Plan for future growth of the facility to minimize future demolition and waste.

Prominently post an environmental code of conduct for visitors and staff.

Especially in tropical areas, distinctive design consideration should be given to insect, reptile and rodent control. The approach to design should minimize opportunities for intrusion rather than killing the "pests".

Interior furnishing and equipment should represent local resources except where special purpose furnishings or equipment are not readily available from local sources.

Provide facilities to accommodate "messy" activities; placement of boot scrapers, outdoor showers, etc. may become a necessity for operation in some areas. Provide minimum storage for travel gear such as backpacks, boots and other camping equipment.
APPENDIX V

PRELIMINARY GUIDELINES FOR RESPONSIBLE DESIGN AND APPROPRIATE ARCHITECTURE FOR ECOTOURISM FACILITIES

Architects bear a special responsibility in the design of facilities that are to be located in the fringe of earth’s last unspoiled areas. There must be a consultative process between management and administration with the planners and designers, so as to begin with a common understanding of the design concept. Adequate design guidelines need to be established so that ecotourism facilities will enhance and not degrade the natural features of the corresponding area.

Even prior to this, the location of physical developments should be decided by short guidelines, so that features are not lost however much the actual design is mitigated.

In the physical planning of ecotourism centres, a new approach in architectural design and construction technology is required. Since these tourism centres must be located in or very near to natural areas which frequently have difficult access or are relatively isolated (and which, of course, are characterized by a fragile and delicate ecological balance), it is obvious that all building facilities, roads, and services must be designed in such a way that environmental impact is minimized and that a certain level of functional self-sufficiency is attained.

It is wise to employ what could loosely be termed as "ecotechniques" in the physical planning and construction of these facilities: solar energy, capture and utilization of rain-water, recycling of garbage, natural cross-ventilation instead of air conditioning, a high level of self-sufficiency in food generation (through orchards, "ecological farms", aquaculture, etc.), provision of underground wiring and other services, the use of locally available building materials and native technologies, and the blending of the architectural shapes with the natural environment. Buildings, in other words, must not overpower or try to compete with the surrounding land and plant forms, which after all constitute the main attractions, together with the wildlife (and, in some cases, ancient architectural remains or typical villages with vernacular architecture).

Accommodations for nature-oriented tourists must be modest but comfortable, clean but unpretentious. This gives an added advantage to ecotourism over conventional leisure tourism: the cost of an ecotourism centre is about four or five times lower per room unit compared to a five-star resort hotel (Ceballos-Lascurain, 1986). Notwithstanding, many rich ecotourists from industrialized countries are willing to pay rates as high as those corresponding to deluxe accommodations in the city or the beach. The experience that an ecological tourist seeks when he visits a natural or exotic place is the opportunity of communion with nature or native cultures, of getting away from the concrete jungle and the luxuries and commodities of modern urban, "civilized", life.

The pristine environment of a tropical rain forest is no place to make an "architectural ego statement" inconsistent with the setting. It is important for the architect to put ego aside and
draw inspiration from nature and the uniqueness of the particular project site.

Designs should recognize the limitations of local labour forces as well as the availability of indigenous materials. This requires the architect to visit local labourers to assess their capabilities and to review time-tested local building materials and techniques. Hotels and lodges for ecotourism must be built to conform with their surroundings. A high-rise in the jungle or any other undisturbed natural area would not only be foolish but dangerous for the ecosystem. Discotheques in ecotourism hotels are completely out of place.

Timing of construction work is critical in some locations. The rainy season in rain forest areas, for example, may all but preclude construction activities of any kind. Work in progress may be subject to tremendous erosion problems if careful planning does not anticipate weather conditions. It is essential that construction activities be tied to the pulse of nature.

Designs should recognize the challenges of building in areas infested with termites, rodents, and snakes. Study of local building techniques often reveals unique approaches to dealing with "unwanted guests" in the human habitat within tropical forests.

Special care should be taken in planning of trails through untouched areas. It is prudent to hire a naturalist to help place the trail system to minimize disruption of wildlife and plant biosystems. Special attention should be granted to creatures that rely on trees as aerial pathways or habitat. Careful consideration should be taken in the placement of access roads into a site. Vehicular travel within protected areas should be severely limited if not avoided completely. A civil engineer should also be involved in the design of trails where erosion control may be an issue. Opportunities for handicapped individuals should be provided wherever possible.

Architecture for ecotourism must be seen as an educational vehicle to enhance the awareness and sensitivity of the ecotourist, scientist and student. The emphasis on nature-based design should be for education as well as to provide creature comforts in environments often hostile to humans. A thorough understanding of the owner’s or manager’s operational needs should precede design.

Park designers build on the work of park planners by incorporating systems and technologies to support sustainable development. Major technological advances in energy efficiency, water conservation, noise and air pollution abatement, solid waste management, and the use of non-toxic substances in construction have brought sustainable development to the forefront of design during the last decade. The challenge for park designers today is to find ways to use new and appropriate technologies in the retrofitting of existing facilities as well as in the development of new ones (Patten, 1992).

Standards and practices to minimise the impact of development on protected area environments should be a matter of policy. The Malaysian National Ecotourism Plan should include guidelines for sustainable facility design, construction, and maintenance, including the following items:

- buildings, with emphasis on solar orientation, configuration, technology, and visual compatibility,
transportation and circulation, with emphasis on alternative transportation systems, directional and informational signs, and road and surface parking standards,
- utility systems, with emphasis on energy-efficient heating, cooling and lighting, water conservation, wastewater treatment, and solid waste management including recycling,
- the reduction of on-site and off-site development impacts on air, water, and sound quality,
- methods for educating visitors about sustainable design and development.

ARCHITECTURAL PROGRAMME FOR AN ECOTOURISM CENTRE

The architectural programme for an ecotourism centre in a protected area should be based on the concept of juxtaposing two different areas: the lodging/support services area and the administration/interpretation/research area. The following material has been adapted from Estudio de Factibilidad y Anteproyecto Urbanístico de Turismo Ecológico en la Reserva de la Biosfera de Sian Ka’an, Quintana Roo, México by Héctor Ceballos-Lascuráin (1986). It therefore represents a case study of one large site, which is not necessarily applicable to all other sites, but which illustrates a number of principles.

The two areas are conceived, in principle, as depending from separate organizational structures, albeit with close functional links. Physical separation between both areas is about one kilometre. The concept of integrating facilities serving hotel functions with those related to administration/interpretation/research activities is an interesting one, since income from tourism use can pay for biosphere management and scientific research. The hotel area should be concessioned to a private entrepreneur (preferably a local group or, if possible, the local community itself).

The architectural programme for the ecotourism centre was as follows:

1. **Lodging/support services area**

This area requires an approximate expanse of 6 hectares, encompassed by a wire-mesh fencing, for security and control reasons. This area is composed of:

   a) **Reception and administrative offices of hotel or lodge (with an approximate area of 1,500 m²),** composed of:

   - Lobby and front desk
   - Manager’s office
   - Accountant’s office (and safe)
   - Small shop
   - First-aid dispensary
   - Storage area
   - Sanitary facilities (men and women)
   - Dining area for seating capacity of 100 (20 tables)
   - Kitchen
Lodging for manager and assisting staff

b) Bungalow sector: 40 bungalows with a built-up area of approximately 50 m² each (2,000 m² in total). Each bungalow will have a multiple-use space (living/sleeping) accommodating 2 large beds, a sofa-bed, a desk, a coffee table, closet, bathroom (with WC, wash-basin and shower - with hot water, provided by two solar energy collectors placed on roof of each bungalow), and a small terrace (offering hammock-hanging possibilities). Bungalows are paired, with parking space for one car at the entrance of each bungalow.

Bungalows will be laid out around a central area with a swimming pool. Access to bungalow sector will be by a gravel circuit road. Lay-out of bungalows will be informal, "organic", interspersed among abundant natural vegetation.

c) Camping and mobile home sector (with an area of approx. 15,000 m²), made up of:

- Area for 15 mobile homes, with collective bathrooms, water and butane gas (or bio-gas) taps, outdoor picnic tables, camp stove, garbage can.

- Tent sector (for a capacity of 6 tents), sharing services with previous item.

d) Waste recycling plant (discriminating organic from inorganic waste).

e) Orchard and vegetable garden sector (approx. 8,000 m²), for providing a high degree of food self-sufficiency for the hotel area.

f) Cattle and poultry-raising sector (approx. 10,000 m², fenced-in, but with easy access to more extensive - and existing - pasture area), with stables, for providing a high degree of food self-sufficiency for the hotel area.

g) Aquaculture basin (approx. 2,000 m²), irregularly shaped, for providing a high degree of food self-sufficiency for the hotel area, but also for attracting local wildlife (birds, reptiles, amphibians and fish).

h) Machine room (including ecotechnical equipment)

i) Entry control booth.

2. Administration/Interpretation/Research (AIR) Area

This area will cover a surface of approximately 8 hectares, enclosed by a wire-mesh fence, for control and security purposes. The administration of the Biosphere Reserve is housed in this area. Interpretative services for tourists are also included here. This area is composed of:
a) Administration/reception sector, with a built-up area of some 1,800 km², made up of:

- Reception and lobby
- Biosphere Reserve Administrator's office
- Interpretative centre, which includes exhibit area (relief map of reserve, photos, informative panels, physical samples of mineral, vegetable and animal specimens) and a small projection room for audio-visual shows, with a seating capacity of 50 people.
- Small shop (guidebooks, checklists, curios, handicrafts, film, etc.)
- First-aid dispensary
- Storage room
- Sanitary facilities (men and women)
- Dining area for reserve administration staff and researchers, 212 with a seating capacity of 30 people
- Kitchen
- Outdoor amphitheatre for lectures and other interpretative activities

b) Living quarters for reserve staff and resident and visiting researchers, with a built-up area of 1,200 m², made up of:

- 12 dwellings (with an average area of 70 m² each), with an architectural programme similar to that of bungalows, but each one with a built-in kitchenette.
- Communal area, with TV, informal reading and meeting areas, and outdoor swimming pool.

c) Research/laboratory sector, with a covered area of 800 m², made up of:

- Laboratory unit, divided into three basic parts:
  - Covered area with portico, with tables (with sink) for "dirty" work, dealing with soil and water samples, plant and animal specimens, etc.
  - Closed area with with tables and laboratory equipment for fine work.
  - Room for drying specimens and storage area for lab equipment (microscopes, stoves, germinator, etc.)
- Library
- Cubicles for reading and doing research
- Meeting room

d) Waste recycling plant (discriminating organic from inorganic waste).

e) Orchard and vegetable garden sector (approx. 7,000 m²), for providing a high degree of food self-sufficiency for the AIR area.

f) Cattle and poultry-raising sector (approx. 8,000 m²).
g) Aquaculture basin (approx. 2,000 m²), similar to the one in hotel area.

h) Menagerie sector (open and semi-open areas), for observation and experimentation with live specimens of local fauna (approx. area of 7,000 m²).

i) Greenhouse for observation and experimental cultivation of species of local flora (approx. 7,000 m²).

j) Machine room (including ecotechnical equipment).

k) Entry control booth.

l) Nature trail with a total length of some 2 km (designed as a loop, offering the possibility of a half-way short-cut return to starting point), with some 20 sign-posts for interpreting main features, designed in an unobstructive way. This nature trail should have:

- Sanitary facilities at the point furthest from entry
- Garbage cans placed at regular intervals (every 200 m or so)
- An observation tower (50 m high) for watching the forest canopy
- A blind or hide (for wildlife observation and photography), with special glass (transparent from inside and semi-reflective from outside)

m) Dock for boarding and unboarding ecotourists and researchers taking boat excursions on the lagoons, canals and mangroves.

Material could be added to the above guidelines concerning design for the disabled, refuse treatment, transportation, and road and trail design.