



35

IMPLEMENTATION OF THE CBD PROGRAMME OF WORK ON PROTECTED AREAS: PROGRESS AND PERSPECTIVES



Abstracts of Poster Presentations
at the Second Meeting of the
Ad Hoc Open-ended Working
Group on Protected Areas,
11–15 February 2008 in Rome, Italy



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Biological Diversity



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Implementation of the CBD Programme of Work on Protected Areas: Progress and Perspectives

**Abstracts of Poster Presentations at the Second Meeting
of the Ad Hoc Open-ended Working Group on Protected Areas,
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FOREWORD



Protected areas are the cornerstones of biodiversity conservation. The number of protected areas has been increasing steadily over the last few decades, making them one of the planet's most significant land uses. There are now more than 100,000 protected sites worldwide, covering about 12% of the Earth's terrestrial surface.

The existing system of protected areas is not, however, always effectively managed, nor does it adequately represent all ecosystems, habitats and species important for conservation. As a result, the programme of work on protected areas, adopted by the Conference of the Parties (COP) at its seventh meeting in 2004, calls for the establishment and maintenance of a "comprehensive, representative and effectively managed national and regional protected area system" by 2010 for terrestrial and 2012 for marine areas. Since the adoption of the programme of work, some 2,300 new terrestrial protected areas and 50 new marine protected areas, covering approximately 50 million hectares, have been established.

COP 7 also established the Ad Hoc Open Ended Working Group on Protected Areas, which met for the first time in Montecatini, Italy the following year. In 2006, at its eighth meeting, the COP decided to convene the second meeting of the Working Group to review implementation of the programme of work and to explore options for mobilizing financial resources for its implementation.

The abstracts contained in this volume of the CBD Technical Series were prepared to accompany the posters displayed at the second meeting of the Ad Hoc Open-ended Working Group on Protected Areas, convening from 11 to 15 February 2008 at the headquarters of the Food and Agriculture Organization (FAO) of the United Nations in Rome.

Parties, other Governments and relevant United Nations, inter-governmental, non-governmental, regional and international organizations, indigenous and local communities, and the private sector were invited to contribute posters relating to one or more of the four elements of the programme of work on protected areas:

- Direct actions for planning, selecting, establishing, strengthening and managing protected area systems and sites
- Governance, participation, equity and benefit-sharing
- Enabling activities
- Standards, assessment and monitoring

Contributors were encouraged to relate their topics to climate change, the 2010 biodiversity targets, the Millennium Development Goals, poverty alleviation and/or any other goals agreed within relevant inter-governmental processes.

Contributed by almost 100 authors, these abstracts and posters use on-the-ground examples to illustrate such issues as: what is being done, and what needs to be done, to strengthen protected area sites and networks; the relationship between protected areas and their traditional inhabitants, including the need for and approaches to capacity-building; actions and inputs for successful implementation of the programme of work; and measuring and assessing progress in protected area coverage and effectiveness.

The contributors highlight the importance of protected areas, and hence of the effective implementation of the CBD programme of work on protected areas, for the achievement of the 2010 biodiversity target. They illustrate that if we manage to increase coverage of the world's terrestrial and marine protected areas, covering all important biomes and species, and if effective management systems can be put in place, we will make a major step towards the realization of this target.

I wish to thank all those who have contributed abstracts to this volume of the CBD Technical Series.

A handwritten signature in black ink, consisting of a large, stylized 'A' followed by a vertical line and a small crossbar.

Ahmed Djoghla
Executive Secretary

1

**DIRECT ACTIONS FOR PLANNING, SELECTING,
ESTABLISHING, STRENGTHENING, AND MANAGING
PROTECTED AREA SYSTEMS AND SITES**

1. NILE ISLANDS HISTORY AND FUTURE

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Keywords: Egypt, Aswan, islands of Nile, birds, protected areas

INTRODUCTION

The Nile is the life of Egypt, and it is at its most beautiful in Aswan. Aswan is located in southern Egypt, about 879 km south of Cairo. For some 1200 km along the length of the Nile, from Aswan to the Mediterranean coast, the main stream of the Nile and its Rosetta and Damietta branches embrace some 500 islands, which constitute a complex ecosystem. The islands exhibit great diversity in origin, size and structure (El Hadidi and Hosni, 2000); 144 of them, spread over 16 governorates, have been designated a protected area. Twenty seven of these islands are located in Aswan. The granite islands of the First Cataract are among the oldest-known islands, and their natural vegetation represents the only remains of the original plant cover of the Nile land to have survived after the construction of the Aswan Dam and High Dam (El Hadidi and Springuel, 1978).

NILE ISLANDS AND BIRDS

All of the islands are wetlands that are considered biodiversity reservoirs and have special importance in the life of migratory birds. All islands are surrounded by aquatic plants, like *Phragmites*, which are considered a good habitat for birds, and particularly Acacia trees (*Acacia nilotica*) which are also the best trees for many birds, such as herons (e.g., Cattle Egret, Little Egret, Squaccoo Heron, Grey Heron, Purple Heron, Night Heron, Little Bittern), Black Kites and many passerines, which nest in Acacia trees. Fluctuations in the water level led to the formation of muddy lands, which are considered suitable habitat for waders. Rangers of the protected area and volunteers have monitored 154 species of birds in Aswan, including residents, migrants and visitors.

BIRD-CONSERVATION ACTIVITIES OF THE PROTECTED AREA OFFICE

- regular monitoring of bird species in Aswan city
- establishment of a ringing station for migratory birds
- raising awareness of the local community

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2. NEED FOR A COMPREHENSIVE ASSESSMENT OF MANAGEMENT EFFECTIVENESS OF THE PROTECTED AREAS IN INDIA

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Keywords: India, protected areas, management effectiveness

THE RATIONALE

The interest in assessing the management effectiveness of protected areas (PAs) is of recent origin and is gradually developing strong roots. The fact that most of the PAs are not able to meet the very objectives for which they have been established despite the requisite attention raises concern regarding management effectiveness. In a span of two decades India went through three events of 'tiger crisis', forcing the country to evaluate the functioning of its tiger reserves and setting up of a Tiger Conservation Authority. Park, people and wildlife conflicts, poaching, forest fires, pressures of grazing and unplanned tourism continue to threaten and place pressure on our protected areas.

If the recommendations of Rodgers and Panwar (1988) were met, India's Protected area coverage would increase from the present 4.5% to 5.74% by the addition of 67 new National Parks and 203 Wildlife Sanctuaries to the already existing 578. This increase may enrich the ecological representation of different forest types and bio-geographic zones of India, however, with the present level and nature of constraints it may not be possible to scale up the efficiency in PA management. In a scenario where only 39% of the National Parks and 34% of the Wildlife Sanctuaries have management plans, 22% and 16%, still under preparation, and 39% and 50% with no management plans it becomes imperative to direct the attention of policy makers to this aspect of conservation. The situation gets aggravated with the following ground realities with respect to Indian PAs:

1. Formal notifications in India still remain incomplete due to complexities involved in the settlement of land rights. Conflicts between parks and people remain an issue in most of the PAs.
2. Although a PA system targets conserving the representative forest types and representatives of the entire spectrum of biological diversity, focus even today is on the flagship species; management aspects of other species which might play a keystone role in ecosystem functioning remain neglected. Absence of adequate information on the ecological role and requirements of the species exacerbates the problem. This has resulted in two categories of PA- (i.) High Profile PAs with charismatic flagship species drawing the requisite attention and funding and (ii) Low profile PAs which may play a significant role in conserving biodiversity but remain less attended.
3. The recent amendment in the Wildlife Protection Act of 1972 to include Community Reserves has met with little success, indicating the wide distance that has emerged between people and PA management.

Apart from an analysis of the Tiger Reserves of India by the Wildlife Institute of India (WII), using 46 criteria relevant to India, a comprehensive assessment of the management effectiveness of the PAs has not been undertaken. A brief intervention had been made by WWF-India which implemented the Rapid Assessment of PA Prioritization and Management (RAPPAM) in the states in Western Ghats and Eastern Himalaya in India in 2006. RAPPAM was a pioneering effort but restricted to only three states in India viz., Arunachal Pradesh, Sikkim and Kerala. While the evaluation exercise by WII was only restricted to Project Tiger Areas, implementation of RAPPAM brought to fore some of the following shortcomings:

1. The findings of the RAPPAM merely reiterated the pressures and threats known to the park managers. Not all the park managers are able to contribute to the past and future trends in threats and pressures.
2. There is no room for a root cause analysis of the pressures and threats to the PAs

3. Some of the pressures and threats emanate beyond park boundaries and therefore beyond the jurisdiction of the park officials.
4. All stakeholders participating in RAPPAM process are not well versed with the issues of the PA management. Their responses tend to skew the overall findings.

A PROPOSED INITIATIVE ON MANAGEMENT OF PROTECTED AREAS IN INDIA

The above-mentioned shortcomings therefore necessitate development of a more robust methodology for a comprehensive assessment of management effectiveness of the PAs in India. Assessment of terrestrial PAs needs to be complemented with freshwater and marine PAs and the methodology that works best for the policy environment in India has to emanate from a consultative process. The methodology should also be able to draw the collective strengths of some of the approaches and initiatives viz., i) Assessment tools available with The Nature Conservancy, ii) Tools available with WWF-International, iii) Score cards developed for the Marine PAs by the World Bank, iv) Methodology available with UNESCO for World Heritage sites., and v) Assessment of governance of the PAs being developed by IUCN.

The proposed methodology should be able to:

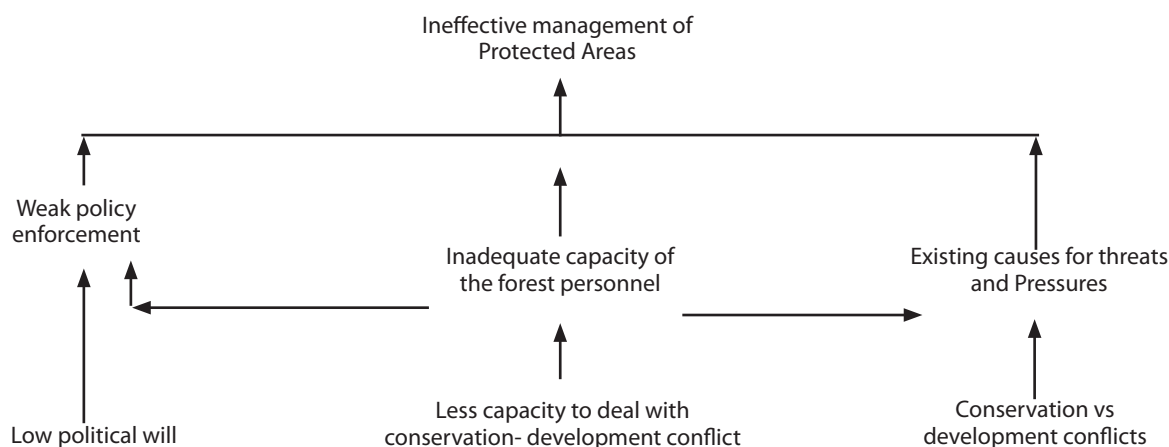
1. Undertake an in-depth analysis of the root causes of the threats and pressures existing within as well as outside the park boundaries. See Fig 1.
2. Highlight issues specific to the park
3. Capture the gaps that hinder effective management of protected areas.

Biodiversity Conservation Programme of Winrock India will continue in its endeavor in this direction.

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FIGURE 1: A situation analysis for ineffective management of protected areas



3. PLANNING STRATEGIES FOR PROTECTED FOREST AREAS IN ITALY: THE CASE OF OVERLAPPING CONSERVATION NETWORKS

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Keywords: protected forest, Nature 2000 network, national protected areas network, in situ conservation, naturalization

INTRODUCTION

Italy has strongly pursued a conservation policy in the last decades through protected areas. Since the adoption of the national “Framework law on protected areas” (L. 394/1991), several national and regional parks and reserves have been identified and subject to rules.

In addition to the national legislation, the European Directives 79/409/EC (Birds Directive) and 92/43/EC (Habitats Directive) establish the Italian network of designated areas for biodiversity conservation, called Nature 2000. These Directives are the most effective measure set forth by the EC for the conservation of wild animal and plant species and natural habitats of European importance at the continental level. The management of Nature 2000 sites pursues one fundamental aim: preserve, restore and maintain at a proper conservation status the habitats and species the site has been proposed for, adopting ad hoc measures of conservation or proper interventions.

At present, the wide Nature 2000 Network in Italy covers approximately 5,812,828 hectares, distributed over 2,280 Sites of Community Interest (SCIs) and 590 Special Protected Areas (SPAs).

Further to the EC Directives, Italian Regions produced their list of protected sites through the institution of Regional Important Sites (SIRs). For example, in Tuscany the Regional Law 56/2000 “Rules for protection and conservation of natural and semi-natural habitats of wild flora and fauna” allowed the creation of a network of SIRs, including the SCI under the Habitats Directive and the SPA under the Birds Directive.

Investigations on the relations between the Nature 2000 Network sites and the protected areas are being realized (Blasi et al. 2004), because most of those areas are overlapping.

In Italy, many protected areas are predominantly characterized by forest habitats. At national level, a number of experimental data show that woody formations cover more than 40 percent of protected areas surface (Ciancio et al. 2007). Throughout the years, efforts have been made in researching the appropriate strategies to conserve forest habitats within protected areas (Ciancio et al. 2002) and sites (Barbati et al. 2002). Nevertheless, the presence of overlapping conservation areas and sites requires the adoption of planning strategies to halt the threats to the *in situ* conservation of biodiversity, taking into account the different requirements of legislation.

This paper presents an Italian case study of protected forest areas under overlapping conservation networks, where innovative planning strategies have been realized.

CASE STUDY: THE FOREST OF VALLOMBROSA

The “National Nature Reserve of Vallombrosa” is included in the Official List of Protected Areas under Law 394/1991 (EUAP0145). At the same time, the 55,2 percent of its surface is comprised in the SCI “Vallombrosa

and S. Antonio Forest” (IT5140012) under the Nature 2000 Network (Habitats Directive 92/43/EC), and classified as SIR under the regional Law 56/2000 (SIR46). Overlapping is shown in Figure 1.

The site is located on the Apennine Mountains in Tuscany, 40 km east of the city of Florence, at an altitude included between 470 and 1440 m a.s.l. It covers approximately 2700 hectares, mostly occupied by forests. The National Nature Reserve is extended on 1273 hectares on the western slope of Monte Secchieta (1449 m a.s.l.) and is managed by the National Forest Service through the so-called “Biodiversity Local Office” of Vallombrosa.

Forest formations are composed by the following species: silver fir, beech, black pine, and mixed deciduous plants. Douglas fir, red fir and chestnut are also represented. In accordance with the Habitats Directive, the formations formed by beech with *Abies alba* and beech with *Taxus* spp. and *Quercus ilex* are considered priority habitats for conservations. Among all the bird and animal species of the forest, the following have particular interest: *Certhia familiaris* (connected to the presence of pure silver-fir formations) and *Canis lupus* (connected to the high level of natural conditions within the site). The identified threats to the site are: anthropogenic pressure (mainly along roads and trails); deterioration of silver firs conditions (caused by pollution/acid rains); forest fires (particularly on summer season). In this framework, planning strategies of forest resources must take into account the conservation of silver fir formations and the conservation of “old natural forests” constituted by beech and mixed species.

MANAGEMENT PLAN OF THE “NATIONAL NATURE RESERVE OF VALLOMBROSA”

A “Management Plan of the National Nature Reserve of Vallombrosa” has been drawn up for the period 2006-2025 (Ciancio 2007), with the aim to conserve and increase the biological functionality of forest resources. Planning strategies don’t arise from the simple sum of specific technical expedients to respond to the needs of the different species and habitats as imposed by the laws. The approach adopted through the plan responds to the principles of systemic forest management (Ciancio et al. 2003). In this sense, the plan considers the forest and, more in general, the mosaic of the several ecosystems of the Reserve, as a complex biological system, and not exclusively as a group of trees or a list of species and habitats to protect.

In accordance with Law 56/2000, an assessment of the impact of the plan on the SCI has been realized during the drafting phase, showing that the *in situ* conservation of most of the species depends on the increase of diversity within ecosystem structures, at a temporary and spatial scale. At an operational level, the plan aims at enhancing the process of naturalization in the largest part of the forest of Vallombrosa. In this sense, the plan schedules a series of interventions within the forest oriented to support natural regeneration and the self-regulating mechanisms of the system, also to encourage the conservation of beech and mixed species formations.

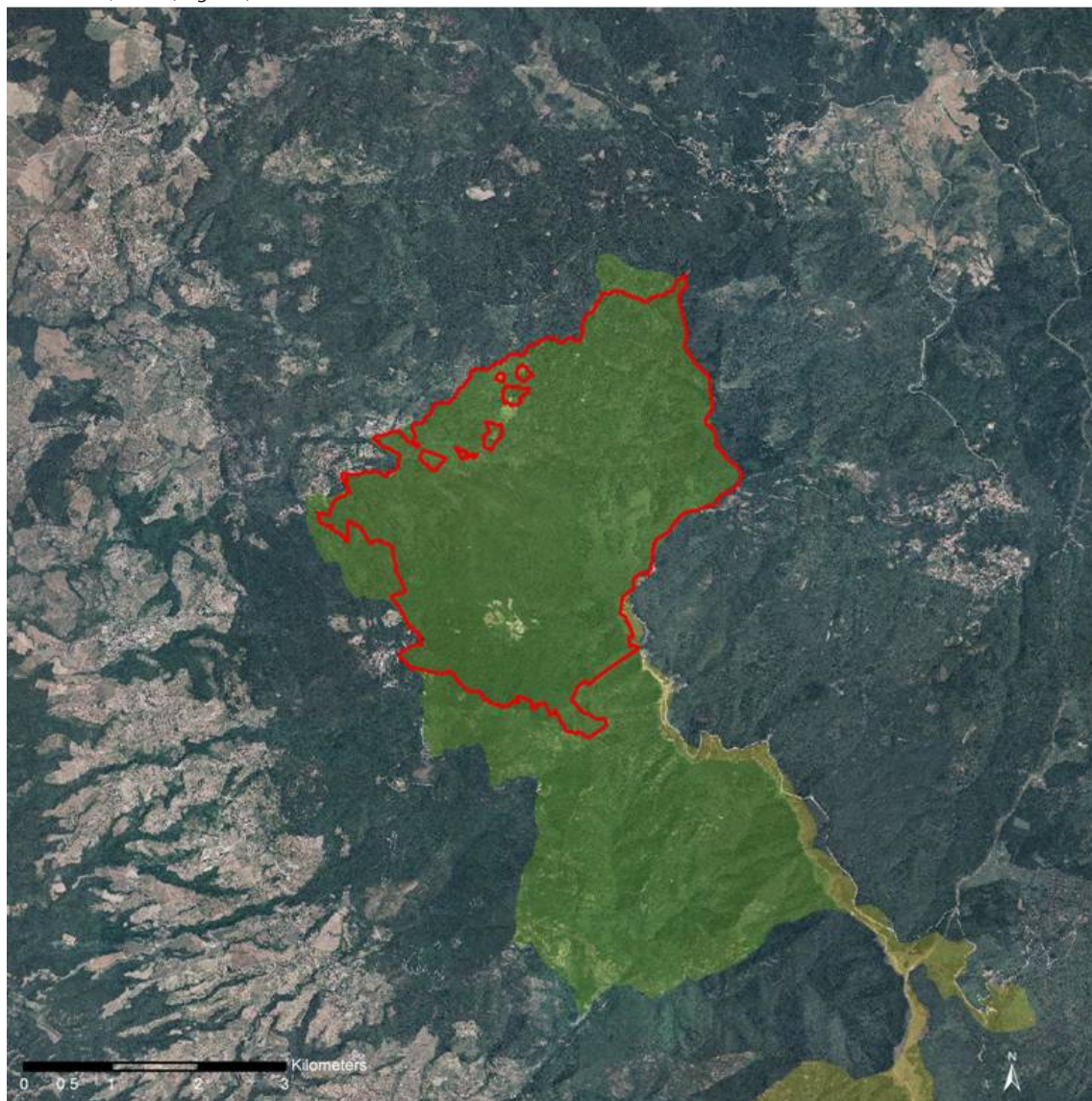
The plan also pursues the preservation of particular naturalistic aspects by excluding any sort of silviculture intervention in a small part of the forest. Moreover, the conservation of specific aspects related to the local traditional forest-knowledge is sought through the institution of the so-called “Silvo-museum”, a small part of the forest where traditional silviculture systems are planned with the aim to conserve historical silver firs formations and ensure the presence of *Certhia familiaris*.

With the adoption of the “Management Plan of the National Nature Reserve of Vallombrosa”, the conservation of naturalistic, historical and cultural values is not in conflict with the management of the forest itself and the practice of silviculture; rather, it is the direct consequence of the adoption of a systemic approach.

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FIGURE 1: Overlapping of the “National Nature Reserve of Vallombrosa” (in red) and the SCI “Vallombrosa and S. Antonio Forest” – IT5140012, SIR46 (in green)



4. GAP ANALYSIS IN THE CONSERVATION OF MARINE BIODIVERSITY OF MEXICO: OCEANS, COASTS AND ISLANDS

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Keywords: Conservation, gaps, omissions, terrestrial biodiversity

INTRODUCTION

Mexico is known as one of the mega-diverse countries due to its exceptional biodiversity and outstanding forms of both pelagic and benthic marine life, which inhabit the coastal, oceanic and island bodies. This analysis was carried out in the context of Objective 1.1 – To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals of the Work Program of Protected Areas of the Convention on Biological Diversity.

METHOD

For the identification of the priority conservation sites, information from several sources was compiled. This included biological and geographic databases and previous planning exercises for marine conservation. This information was used to carry out a national workshop with over 80 participants and reviewers from 43 academic institutions, non government organizations and the public sector, all with broad experience in the topic.

RESULTS

105 priority sites for the conservation of marine biodiversity of Mexico were identified using digital thematic cartography, georeferenced data bases of marine flora and fauna and a list of objects of conservation.

As a first approximation, the priority sites were delimited by taxonomic groups according to the knowledge and experience of the participating experts, as well as the general physical, chemical, biological and geological characteristics of each site. Later on, areas that were important for more than one group were detected, sites were redefined and labeled based on a detailed revision and according to the knowledge of regional experts. A later refinement of the sites was obtained from the validation, and the precise delimitation of each site using digital bathymetry maps, coastal water bodies and types of vegetation, among other spatial attributes. Parallel to the validation of the sites, technical data cards were developed for each site, which included information on the biological, ecological, environmental and risk characteristics of each site according to the information obtained from the experts. Additional information from bibliographic sources was then added to the cards.

In addition, 18 important zones were identified and characterized by their oceanographic processes. Among the most important ones that were identified were upwelling, vertical mixing, waves, tides, currents and countercurrents, river discharges, whirlpools and meteorological and climate phenomena. This integrated information was used as a basis for the selection of priority sites according to their importance for the conservation of marine biodiversity.

The spatial analysis of the priority sites includes marine ecoregions, priority marine regions, marine sites obtained from the national survey and the oceanographic processes. A classification of six levels of the priority sites was later done, taking into account geomorphological, physiographic and ecologic criteria. A prioritization of the importance of the sites was also carried out from the information obtained from the experts.

Finally, the gap analysis showed a low surface representativity (18.33%) within the protected area network. It is important to mention that many of the coastal federal PAs were selected because of their terrestrial ecosystems, leaving out or barely bordering with the coastal water bodies and the littoral zone. This analysis showed that 78 priority sites have less than 20% coverage in the protected area network. Out of these, 21 coastal sites and of continental margin and all deep sea sites are without any protection.

In addition, an insular biodiversity data base was developed, which included information on the general characteristics of the 1 365 insular bodies, as well as information on their species. Up to date, there is information associated exclusively to 149 insular bodies among which the following stand out due to their species richness: Clarión, Cozumel, Banco Chinchorro, Alacranes Reef and Espíritu Santo.

CONCLUSIONS

This exercise represents a framework for decision making and identification of priorities related to marine ecosystems for the knowledge, conservation and sustainable use of marine resources.

Reference

CONABIO-CONANP-TNC-PRONATURA.2007. *Análisis de vacíos y omisiones en conservación de la biodiversidad marina de México: océanos, costas e islas*. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Comisión Nacional de Áreas Naturales Protegidas, The Nature Conservancy, Pronatura, A.C. México, D.F.

For further details go to the Wiki page available at www.conabio.gob.mx/gap

5. GAP ANALYSIS IN THE CONSERVATION OF TERRESTRIAL BIODIVERSITY OF MEXICO: SPACES AND SPECIES

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Keywords: Conservation, gaps, omissions, marine biodiversity

INTRODUCTION

In order to generate an updated and complete assessment of the gaps in conservation of Mexico's protected areas (PAs), Conabio and Conanp, in collaboration with several institutions and specialists, formed a working group with the objective of carrying out this evaluation based on robust and technical criteria. This analysis was carried out within the context of Objective 1.1 – To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals of the Work Program of Protected Areas of the Convention on Biological Diversity.

METHOD

In the context of working together for conservation and in order to generate strategies at the national level, the working group carried out an analysis with multiple approaches and scales to detect priority sites for the conservation of different groups of species and environments. Information regarding several elements of terrestrial biodiversity was compiled, this information included ecoregions, vegetation types, distribution areas and specific data on vertebrates and plants, as well as data from a group of factors that threaten biodiversity, such as habitat destruction and fragmentation and urban and population growth. Workshops were carried out with specialists to define the criteria that would be used to prioritize the biological importance of species, ecosystems and threat factors to biodiversity. In order to identify priority sites, different algorithms were used, the data was analyzed separately to identify priorities for several groups and then compared with the analysis where all the elements were compiled.

RESULTS

In spite of the great efforts made in the last decades and of the main role of PAs in the conservation of ecosystems and species, the existing networks neither adequately cover all the identified ecoregions, nor the priority sites that were identified in the analyses, which are only partially protected.

Of the 96 terrestrial ecoregions, 11 are currently without protection and 50 are underrepresented in the PA systems. Biases were observed in the protection of the highest proportion of the highlands (altitudes greater than 2 800 m asl) in comparison with the rest of the country and the lands at intermediate altitudes between 1 000 and 2 000 (m asl) are underrepresented in the PA systems. With regards to vegetation types, the lower levels of protection are found in dry forests, tamaulipeco spiny thicket, and pine-oak forests (taking into account both primary and secondary vegetation) and are more severe for vegetation such as rain forest and mesophile forests for which there are only remnants of their original cover. These analyses will provide a general framework for the planning and conservation at a regional scale.

CONCLUSIONS

The results show the enormous complexity of achieving the objective of conserving areas to represent the most threatened species and habitats, which is discussed from a national point of view. The priorities for conserva-

tion, defined for each group individually, have a very low coincidence. The analysis with all its elements shows that even if the protected surface was increased to cover 16.6% of the country, which would adequately cover the sites with the highest priority, then many of the elements of conservation interest considered in this study still wouldn't be covered. Moreover, this would not stop the rate of growth of several threatening processes that are present throughout the entire country and even at a worldwide scale.

Mexico is a highly diverse and heterogeneous country, so there are many practical challenges and difficulties in the identification of the priority elements of biodiversity, for the conservation in a small number of areas. It is evident that other conservation mechanisms are needed in addition to PAs to maintain native viable populations throughout their range in the variety of landscapes in which they are found. The group of sites identified for this analysis set a precedent to define the priority areas for conservation and to guide the strategies to strengthen the national agenda for conservation and sustainable development.

Reference

Conabio-Conanp-TNC-Pronatura-FCF, UANL. 2007. *Análisis de vacíos y omisiones en conservación de la biodiversidad terrestre de México: espacios y especies*. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Comisión Nacional de Áreas Naturales Protegidas, The Nature Conservancy-Programa México, Pronatura, A.C., Facultad de Ciencias Forestales, Universidad Autónoma de Nuevo León, México.

For more information go to the Wiki page available at www.conabio.gob.mx/gap

6. UPCOMING RESEARCH CONCERNING AUCTIONS FOR CONSERVING AND PROMOTING BIODIVERSITY

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Keywords: conservation auction, plant biodiversity, agri-environmental policy, EAFRD-Regulation

INTRODUCTION

The abstract deals with current need for research concerning an innovative environmental policy instrument for rewarding landowners for specific environmental services on their sites or the selection and management of protected areas. This kind of procurement auctions can also be used for selecting and rewarding specific actions within protected areas or on protected sites. In this specific case the abstract mainly refers to the protection of biological diversity, whereby a protected area generally can be defined as an area of land dedicated to the protection and maintenance of biological diversity and of other natural and resources, managed through legal or other effective means.

As a current example, the European Union's Council Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) has introduced auctioning as a new instrument for granting agri-environmental payments and awarding conservation contracts for the current multi-annual budgetary plan (2007-2013). Even though the discussion concerning the use of economic instruments in environmental policy aimed at the conservation and protection of biological diversity has already expanded in the 1990s, most states still had relied on regulatory (Latacz-Lohmann and Hodge, 2003). Market-based instruments have only recently gained more attention and their implementation is still characterised by a severe shortage of knowledge and practical experiences. In Europe, the practical evaluation of conservation auctions is mainly restricted to isolated and scientifically supported case studies or pilot programmes.

This abstract therefore deals with a brief overview of current need for research and first conceptual ideas by the author, concerning a worldwide comparative study of conservation auctions, the question of how to evaluate the ecological quality of plant biodiversity especially against the background of ecological stock dynamics under uncertainty and the design of a specific environmental benefits index for plant biodiversity.

EVALUATION OF CONSERVATION AUCTIONS

Taking into account the currently growing importance of cost effective instruments for meeting conservation provision targets, upcoming research will include a comparative study of the current state of the practical implementation of conservation auctions. The objective of the survey is to analyse practical conservation auctions based on standardised criteria and to learn about the specific auction performances from an ecological, economical and political perspective. Based on the findings, critical factors for success as well as requirements for the practical design and implementation of upcoming conservation auctions will be deduced and made available to the scientific community as well as to policy makers. Within the currently planned survey the different ways of how conservation auction components have already been used in the United States, Britain, Australia and Germany will be analysed.

The conservation auctions will be evaluated by various criteria, as follows: i) general auction design (one-shot or repeated auction; single-unit or multi-unit auction), ii) rewarded ecological service and ecological objective, iii) payment format (uniform- or discriminatory price auction), iv) bid valuation, v) auctioneers institutional

integration, vi) regional demarcation, vii) number of participants, viii) number of (submitted and successful) bids, ix) ecological effectiveness, x) efficiency gains and xi) private and administrative transaction costs.

INFORMATION AND ECOLOGICAL STOCK DYNAMICS UNDER UNCERTAINTY

Another specific field of further research is the question of how the auctioneer (the administration) should deal with information about the sites, the ecological goods and ecological stock dynamics under uncertainty. The initial situation within a conservation auction is characterised by the situation that the auctioneer is the only supplier of a specific agri-environmental or conservation programme and therefore decides about the demand for ecological services. On the other hand, the supply-side of environmental services is made up of a large number of landowners and is therefore – at the beginning of the first auction – characterised by a comprehensive competition about payments for ecological services. Within the following bidding process and bid valuation not all farmers' bids will be accepted. The successful landowners are now making specific investments to provide the environmental goods or environmental services on their sites. If the ecological service is provided contractual and in due time, this may result in incentives for lock-in-effects both from the perspective of the auctioneer and the farmer to keep up the contractual relationship. In the case of repeated auctions the main question arises how the administration should deal with the information about the hitherto successful sites, now offered again, as well as new bids for yet unknown sites and ecological stock dynamics in repeated auctions under uncertainty. That there is an empirical evidence of ecological stock effects or stock dynamics in the case of long-term biodiversity change has been recently proven by Hanley et al. (2007).

The starting point of further research within this not widely applied field will be a conservation auction model. The main objective is to analyse the interaction of the ecological quality as a stock figure, the ecosystem service as a flow figure, the farmer's management effort as a flow figure as well as the convex management cost and the bid price over time and under uncertainty for a specific site. This approach will be developed by taking into account current state-of-the-art adaptations of standard auction theory and conservation auction models, experiences from laboratory experiments and already implemented conservation auctions as well as approaches of how to value ecological or, in this specific case, biodiversity quality.

ENVIRONMENTAL BENEFITS INDEX FOR PLANT BIODIVERSITY

A promising solution to meet the practical requirements of the bid valuation as part of most repeated conservation auctions seems to be the use of an environmental index. Current research especially deals with the definition and design of a specific environmental benefits index for plant biodiversity. Therefore two different environmental indices will be used as role models: the Environmental Benefits Index (EBI) as part of the Conservation Reserve Program in the United States (Szentandrási et al., 1995) as well as the Biodiversity Benefits Index (BBI) within the BushTender trial in Australia (Stoneham et al., 2003).

Based on an evaluation of these environmental indices as well as further approaches and objectives, a specific so-called 'Environmental Benefits Index for Plant Biodiversity' (EBIPB) will be developed. This EBIPB will combine both elements of the EBI and the BBI as well as new criteria to reach the objective of a differentiated bid valuation within repeated auctions, based on economical, ecological and social criteria. Criteria will for example be i) the number of different species, ii) the relative abundance of different species, iii) the expected additional negative and positive ecological spill over effects, iv) the relevance of conservation priority areas, v) the expected sustainability of management efforts, vi) the ecological performance per euro in previous auctions, vii) regional populations' preferences, viii) the bid price per hectare and ix) a risk factor.

The use of an environmental benefits index and the change of its parameters and their valuation also seem to be a promising way of how to reduce the opportunity for bidders to learn in repeated auctions.

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7. ENVIRONMENTAL RISK ASSESSMENT FOR BIODIVERSITY AND ECOSYSTEMS: THE ALARM PROJECT AND THE PERSPECTIVES FOR PROTECTED AREAS OF BORNEO

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Keywords: biodiversity, risk assessment, global change, protected areas, Borneo

THE ALARM (ASSESSING LARGE-SCALE ENVIRONMENTAL RISKS FOR BIODIVERSITY WITH TESTED METHODS) PROJECT

Based on a better understanding of terrestrial and freshwater biodiversity and ecosystem functioning, ALARM develops and tests methods and protocols for the assessment and forecast of large-scale environmental risks in order to minimise negative direct and indirect human impacts. In particular, risks arising from climate change, environmental chemicals, biological invasions and pollinator loss in the context of current and future European land-use patterns are assessed.

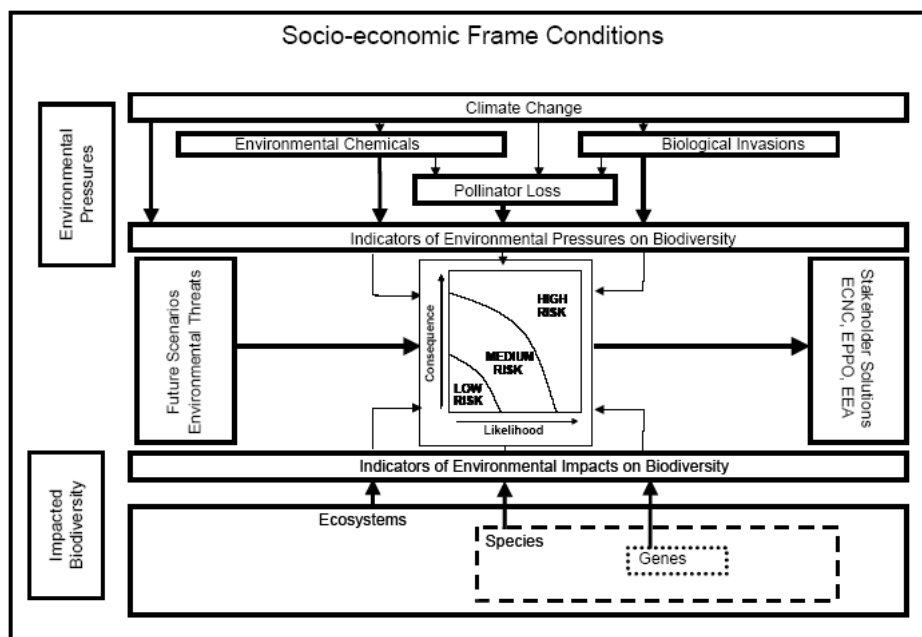
The general ALARM objectives are:

- To develop an integrated large-scale risk assessment to biodiversity as well as terrestrial and freshwater ecosystems as a part of environmental risk assessment.
- To focus on risks consequent on climate change, environmental chemicals, rates and extent of loss of pollinators and biological invasions.
- To develop and maintain a research network that is constantly interacting and investigating on a continental scale *across* different environmental problems (impacts) and *across* different spatial and temporal scales of ecosystem diversity changes.
- To establish socio-economic risk indicators related to the drivers of biodiversity pressures as a tool to support long-term policies and to monitor their implementation.
- To provide a contribution to objective-based politics, to policy integration and to derive outcome-oriented policy measures by contributing to the integrated assessment of socio-economic drivers affecting biodiversity and integrated, long-term oriented means to mitigate them.

The main pressures analysed within ALARM (climate, chemicals, invasions, pollinator loss) are massively introduced into the environment as a function of human activities. They have been generally studied independently of each other. Yet it is clear on a large scale, that they can and will interact, potentially producing effects on ecosystem diversity that exceed all current assessments of potential risk. There are currently no methods that allow continuous integration across these pressures, especially as new information and understanding is developed (within each sector) and new concerns arise about sustainability. In addition there are no methods that cross-connect the pressures with sentinel indicators of changes in biodiversity. ALARM attempts to develop these methods, which will be tested and protocols developed for the assessment of environmental risks.

The ALARM approach, illustrated in Figure 1, shows the four modular environmental pressures to be studied. The impacted biodiversity reaches from genes via populations or species to ecosystems. To quantify the impacts of the pressures ALARM will use combined risk likelihood and risk consequences scores. This approach is used for single as well as multiple pressures. Scenarios are applied to simulate future environmental threats and to quantify risks subsequent on these. Results of these different risk assessment approaches will lead to a Risk Assessment Toolkit (= RAT) which will be communicated to stakeholders for broader application.

FIGURE 1: ALARM scheme to describe the relationships among the four main environmental pressures and the development of methods for Integrated Risk Assessment for the different levels of biodiversity. Socio-economic pressures and indicators form the general background of the ALARM approach (bold arrows: principal effects; fine arrows: additional/indirect impacts).



PROTECTED AREAS IN KALIMANTAN

Timber logging was the first major large-scale land-use change in Borneo and Sumatra since the invention of slash and burn practices. Logging roads are pathways of deforestation, leading to changes in humidity, increased tree mortality at their edges, increased litter/fuel loads for fires, thus increasing susceptibility to fire along these roads, and in the end to changes in forest structure. Roads are also pathways of fragmentation along which land-use changes start and where fire is often used as a management tool for land preparation and also for clearance of new agricultural land. Fire is spreading easily into neighbouring forests when out of control. Degradation of peat forests by fire will continue unless future fires can be prevented or drained peat soils can be restored as wetlands. But further drainage of peat forest and conversion of forest to agricultural land is intended for political and economic reasons. Once forests are degraded they are often turned into plantations.

Regions with widespread logging, previous fires and the use of fire as a tool for land management are at higher risks for disastrous fires (Siebert et al. 2001), resulting in complete deforestation and even more serious haze-health disasters. It can be expected that most of the natural peat forests outside of protected areas in Kalimantan and Sumatra will be converted in the foreseeable future.

Climate change is putting additional pressure on these changes. All major climate change scenarios show a rise in temperature for South-East Asia. When El-Nino then triggers another drought, this drought will develop faster, be more severe and will impact drained peat soils deeper.

Neither forest fires nor forest degradation distinguish between protected and unprotected areas, and when the forests are heavily degraded not much biodiversity is left to be protected. Also, drainage of local peat areas for plantations is impacting the hydrology of remote areas, further degrading the original biodiversity.

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8. THE SUNDARBAN RESERVE FOREST IN BANGLADESH – AN URGENT CALL TO ENSURE THE FULL AND EFFECTIVE PARTICIPATION OF INDIGENOUS AND TRADITIONAL RESOURCE USERS IN ITS GOVERNANCE AND MANAGEMENT

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Keywords: protected areas, indigenous and local communities, customary use, conservation

INTRODUCTION

The aim of this paper is to provide a glimpse of the process undertaken by indigenous peoples and local communities to document and reflect on their traditional knowledge and customary uses relevant to the management of the Sundarban Reserve Forest and to assess the extent to which the Convention on Bio-Diversity (CBD) Programme of Work (PoW) on Protected Areas (PAs) has been implemented by the government of Bangladesh in the Sundarban. The Sundarban was chosen because it is the single largest mangrove ecosystem in the world and three nationally declared PAs are situated within it.

THE SUNDARBAN: INDIGENOUS AND LOCAL COMMUNITIES, BIODIVERSITY AND PROTECTED AREAS

Of the 22 existing PAs in Bangladesh, this paper will address the governance status of 3 PAs in the Sundarban Mangrove Forest. This will also provide an insight of the present situation concerning the implementation status of Articles 8(j) and 10(c) of the CBD.

The Sundarban, designated as a World Heritage Site, is composed of three wildlife sanctuaries: Sundarban East Wildlife Sanctuary, Sundarban South Wildlife Sanctuary and Sundarban West Wildlife Sanctuary. The total area of the World Heritage Site is 1400 sq. km. out of which 910 sq. km. is land and 490 sq. km. is water (Banglapedia, 2005). The three sanctuaries are intersected by a complex network of tidal waterways, mudflats and small islands of salt-tolerant mangrove forest. The area has been recognized globally for its importance as a reservoir of biodiversity. This mangrove supports a unique assemblage of flora and fauna, including charismatic mega fauna like the Royal Bengal Tiger, Estuarine Crocodile and the Ganges River Dolphin. The Sundri tree, after which the Sundarban is named, is an endemic species of this forest (www.bforest.gov.bd/conservation.php).

A large number of communities live in the proximity of the forest (to its North and East), an area called Sundarban Impact Zone (SIZ). Most of these communities rely largely on the resources of the Sundarban for their livelihood. An estimated population of 3.5 million people (including the traditional resource users) inhabits the SIZ. Local people are dependent on the forest and waterways for such necessities as firewood, timber for boats, poles for house-posts and rafters, *Golpata* leaf for roofing, grass such as *Mele* grass (*Cyperus javanicus*), *ulu* grass (*Imperata cylindrical*), *nal khagra* (*eriochloea procera*) for matting, reeds for fencing, fish mostly for their own consumption, and medicinal plants for herbal treatment. The traditional resource users of the Sundarban are the indigenous Munda community and local Bawali (wood cutters), Mouali (honey collectors), Golpata (nypah palm) collectors and Jele (fisherman) communities (Kabir and Hossain, 2006).

EFFORTS BY THE TRADITIONAL RESOURCE USERS TO IMPLEMENT THE PROGRAMME OF WORK ON PROTECTED AREAS

Representatives of these traditional resources users, with the support of Nijera Kori, Onneshan Unnayan, Humanity Watch and Forest Peoples Programme carried out a study in 2006-2007 to document their traditional knowledge, customary uses and cultural practices relevant to conservation and sustainable use in the Sundarban protected areas, thereby contributing to the implementation of Activity 3.2.2 of the PoW. The study demonstrated that the traditional resource users possess distinct customary ways to sustainably manage the resources of the Sundarban, but these practices (as well as the Sundarban) are now under threat by a number of factors.

Apart from the case study, at a national workshop organized in May 2007, they also called upon the government to take action to reform the governance system of the Sundarban by recognizing the role played by customary users (as traditional knowledge and practices are currently ignored and marginalized) and by calling for their full and effective participation in the management and policy-making of this important wetland.

ACTION BY THE GOVERNMENT TO IMPLEMENT THE POW

The poster contains a table evaluating to what extent the most prominent provisions of the PoW in relation to participation, governance, equity and benefit sharing have been implemented in the Sundarban and what actions need to be taken urgently. Table 1 shows the present state of government activities regarding the implementation of PoW.

One of the main recommendations from this analysis is the urgent need to fully involve indigenous and local communities in policy and practice concerning the sustainable use and conservation of the Sundarban.

CONCLUSION

Representatives of indigenous and traditional resources users of the Sundarban have taken action to implement some of the activities recommended in the PoW on PA. They are now calling on the relevant government agencies to do their part to implement the PoW, especially to recognize the rights of indigenous and local communities and to ensure their full and effective participation in management and policy-making of the Sundarban. One way to do this is to implement the PoW on PA in conjunction with the implementation of Article 8(j) and Related Provisions, particularly Article 10(c).

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TABLE 1: Present status of government initiatives regarding PAs

Targets to be achieved	Status of Implementation	Urgency	Responsible authority
Effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.	<ul style="list-style-type: none"> No remarkable initiative has been taken by the state to prevent and mitigate the negative impacts of key threat to protected areas Government accepts the 'eco-system approach' but practically it is totally absent 	Very high	Ministry of Environment and Forest (MoEF)
Establish mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas	<ul style="list-style-type: none"> The Free Prior Informed Consent (FPIC) and Access and Benefit sharing (ABS) mechanism are yet to be developed. The Government has drafted 'The protection of plant variety and farmers' rights' since 1998. Several times it had been amended, but it has not come into force. 	Very High	MoEF
Full and effective participation of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas	<ul style="list-style-type: none"> No effective mechanism has been developed for stakeholders to participate in decision-making. Even to prepare the draft of the National Biodiversity Strategy and Action Plan (NBSAP) -2004, indigenous and local communities are not effectively consulted 	Very High	Forest Department
Frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties	<ul style="list-style-type: none"> PAs are not managed through effective management criteria. They are all exclusively controlled by the Forest Department, which is often blamed for massive corruption and harassment of local communities No data is available on Transboundary protected areas (TBPAs) 	Very High	Department of Environment
Public awareness, understanding and appreciation of the importance and benefits of protected areas are significantly increased	<ul style="list-style-type: none"> Public awareness are significantly increasing, NGOs are playing a vital role to develop awareness 	High	MoEF, Ministry of Local Govt., Ministry of Livestock and Fisheries etc.

9. THE LAST FAMILY OF *MEDEMIA ARGUN* IN THE LOST OASIS IN EGYPT

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Keywords: Medemia argun, Nubian desert oases, plants from tombs, climate change

INTRODUCTION

Medemia argun (Mart.) Wurttemb. ex H. Wendl. is a mysterious and little known genus of fan palm in subtribe Hyphaeninae of tribe Borasseae (Coryphoideae). It is closely related to *Hyphaene* but is distinguished by its unbranched stem, purple fruit with ruminant endosperm and absence of the hastula.

Medemia was first known from sub-fossil material collected in Pharaonic sites. The fruits have been found in tombs dating back to the 5th Dynasty (c. 2500 BC), including Tutankhamun's tomb. The genus thus has considerable cultural significance in Egypt. The palm was first discovered in the living state in Nubian Desert of Sudan and described in 1845 in the genus *Hyphaene* to which it is closely related.

For most of the 20th century, very few records of *Medemia* were made. The genus was presumed globally extinct until the discovery in Dungul Oasis in Egyptian Nubia in 1963. The palm was subsequently recorded at another Egyptian location in the Nubian Desert, Nakhila Oasis, in 1964. These records demonstrate that *Medemia* is a living, if very rare component of the modern Egyptian flora.

The leaves of *Medemia* have been used for making mats; leaves are elastic, soft and strong. Camel drivers made shackles for their camels from its leaves, they considered it better than doom and date palm leaves. Bedouin used *Medemia* for making excellent robes. In present time, in the rare ecosystem in the Nubian Desert, *Medemia* fruits support wildlife by providing a shelter and food (fruits) for the mammals and rodents in its habitats.

MEDEMIA ARGUN THE PALM OF THE TOMBS

The general name of *Medemia* in ancient Egypt was "Mama-n-Khanen" Although the palm is known from Egypt in very few sites, it was quite common in the ancient time. Fruits were discovered in high percentage in the tomb offerings. It was in cultivation in Thebes.

The reason why such inedible fruits were put into the tombs has been a material for discussion. The oldest record of the *Medemia* is going back to the 5th Dynasty, Ancient Empire, from Sakkara. They are kept at the agriculture Museum of Cairo. In the time of the Middle Empire, New Empire and Graeco-Roman fruits were found from different places in Egypt.

CONSERVATION PRIORITY

Medemia argun is confined to the Nubian Desert. In Egypt, there are many small oases, such as Dungul, Kurkur and Nakhila, that merit further study, as they may support scattered populations of *Medemia argun*; at present, there is scarce information on these habitats. Dungul is an important area both historically and ecologically; many tools and implements have been discovered that indicate that the oasis was inhabited during the wet period (Middle Palaeolithic). These oases lie in the extremely arid, rainless part of the Great Sahara.

The mean annual rainfall is not more than 0.1 mm, which indicates that the vegetation of Dungul depends mainly upon the underground water “the artesian water of the Libyan Desert”.

In recent times, only the Dungul site has been revisited. There is no recent confirmation of the population of *Medemia* in Nakhila Oasis, nor has any effort been made to explore for *Medemia* in other remote potential sites in Egyptian Nubia. The oases support the following species on the IUCN Red List of 2006: *Medemia argun* CR, Nubian ibex (*Capra nubiana*) EN, Egyptian Vulture (*Neophron percnopterus*) EN, and Dorcas gazelle (*Gazella dorcas*) VU.

The present state of vegetation is influenced by human activity. The vegetation of these oases is considered one of the last remnants of the vegetation that covered Sahara during Pluvial periods. The ecosystems here are rare, to some extent even unique, vulnerable and critically endangered, making protection necessary.

Long-term threats to this remarkable palm species and other taxa and to the very survival of the oases include visits by people for hunting or safari, mining and agriculture projects, progressive desertification as a result of over-grazing and climate change, and changes to groundwater supplies.

Not only would the loss of *Medemia* in Egypt be a cultural tragedy, it would also be indicative of potentially catastrophic habitat loss at the ecosystem level in the oases of Egyptian Nubia.

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FIGURE 1: *Medemia argun* palm at Dungul Oasis, Nubian Desert, Egypt



FIG. 2 *Medemia argun* fruits.



FIG. 3 *Medemia argun* in Wadi Allaqi



FIG. 4 The last-known population of *Medemia argun* in Egypt



FIG. 5 Ex-situ garden of *Medemia argun* in Aswan University



10. CONDUCTING ECOLOGICAL GAP ANALYSIS FOR THE NEW MADAGASCAR PROTECTED AREA SYSTEM

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Keywords: gap analysis, Madagascar Protected Area System (SAPM), conservation planning, modelling, threatened species

CONTEXT

In September 2003, at the World Parks Congress, the President of the Republic of Madagascar, His Excellency Marc Ravalomanana made a pledge to triple the coverage of Madagascar's protected areas.

Madagascar is well-known as a biodiversity hotspot. The island is home to one fourth of the world's primate species, the fourth global amphibian region and boasts some 90 per cent levels of plant endemism. Madagascar ratified the Convention on Biological Diversity (CBD) in 1995. The planned 6 million ha pledged by President Ravalomanana roughly correspond to 10 per cent of the country's total land area. The 'Durban Vision' therefore directly contributes to the goals and objectives of the PoWPA.

This poster describes the process put in place to ensure this massive increase in protected area coverage was targeted to conserve the most important habitat and species. It discusses the challenges of data gathering and verification through the use of expert groups and various protected area modelling programmes and reports on implementation.

PROTECTED AREAS SYSTEM IN MADAGASCAR

Following President Ravalomanana's pledge in 2003, a Durban Vision group was created under the leadership of the Ministry of the Environment, Water and Forests in order to implement Ravalomanana's plan. With support from IUCN, the Durban Vision group decided in March 2005, that the implementation of the Durban declaration would be best undertaken through the establishment of a Madagascar Protected Area System (or SAPM) that would offer a wider range of options for conservation by looking at the whole range of IUCN categories (i.e. III, V and VI) and new types of governance other than the Association Nationale pour la Gestion des Aires Protégées ANGAP including: governance by decentralized governments (regions, communes); the private sector; local communities; civil society and shared governance between the State and multiple actors. The ultimate goal is to conserve biodiversity while contributing to poverty reduction and specific objectives are:

- To conserve the full array of Madagascar's biodiversity
- To conserve the Malagasy cultural heritage associated with biodiversity
- To maintain ecological services and support wise use of resources.

THE ECOLOGICAL GAP ANALYSIS

The idea of undertaking a state-of-the-art ecological gap analysis for the SAPM was motivated by the target of protecting 6 million ha within five years. The Durban Vision group had to address the key question of: “how do we ensure that we capture the best and most important part of Madagascar’s biodiversity within these 6 million hectares and that conservation is maximized?”

In 2004, a Prioritization Sub-Group of the Durban Vision Group was created. The Prioritization Sub-Group started by receiving training on conservation planning and the use of ‘Generalized Dissimilarity Modeling’ (GDM); learning methods for refining range map data, the use of Marxan to set priorities, and additional potential datasets; distribution data modeling (Maxent) and priority-setting approach (Zonation); as well as discussing the technical requirements for putting in place the expanded national system of protected areas described by the Durban Vision.

Conservation priorities in Madagascar, like those of other biodiversity hotspots, have been the subject of multiple expert workshops. In the case of Madagascar, systematic methods were applied and reinforced by expert opinion at all stages of the planning process.

TARGETS

The purpose of the ecological gap analysis and priority-setting was to state the broad principles that will guide the collection of data, development of biodiversity conservation plans, and identification of priorities for implementation. For the Prioritization Sub-Group the goal was to identify priority areas that maximize biodiversity conservation over 6 million ha. To do this, our priority setting exercise sought to address the following key questions:

- How much of each species is represented within existing protected areas?
- How much of each biodiversity feature needs to be within protected areas (species, habitat types, etc.)?
- How and where can we fill the gaps?

Quantitative targets are a fundamental aspect of systematic conservation planning.

They are interpretations of the conservation requirements of species, environmental classes and other features based on the available information. As interpretations, they are subject to challenge and refinement. The process of setting targets can be improved greatly with the involvement of experts on taxonomic groups and conservation planning.

Following the identification of an interim set of conservation targets for the protected area’s expansion, selected members of the Prioritization Sub-Group used “Marxan” reserve design software to identify efficient sets of areas to meet the representation targets for each species.

11. BUILDING COHERENT NETWORKS OF MARINE PROTECTED AREAS IN CANADA

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Keywords: Ecological selection criteria, implementation, marine protected network planning

Following the first meeting of the Ad Hoc Open-ended Working Group on Protected Areas, Canada hosted an international workshop where science-based criteria were developed to support identification of ecologically and biologically significant areas that might be considered in planning marine protected areas or networks of special management measures. These criteria and the associated guidance were focused on providing a basis for science advice to support spatial management policies, plans, and measures.

USE OF ECOLOGICALLY BASED CRITERIA

Canada has identified Ecologically and Biologically Significant Areas in five priority large ocean management planning areas in the Arctic, Pacific and Atlantic oceans and in the Gulf of St. Lawrence. Identification of these significant areas has been complemented by the identification of Ecologically Significant Species and Ecologically Significant Community Properties according to nationally consistent set of criteria. Together, these significant areas, species, and community properties are considered to be the features most crucial for protecting overall ecosystem structure and function

Within the Canadian framework, these areas, species, and community properties should receive a greater than usual degree of risk aversion in management of activities within the planning areas. To facilitate providing such risk adverse management, explicit Conservation Objectives were established based these significant ecosystem properties. However, it is impractical to require ocean activity managers to simultaneously address large numbers of independent priorities within each of the planning areas. Consequently conservation priorities have been ranked based on the intersection of the criteria for Areas, Species, and Community Properties in each planning area, and the highest priorities expressed as Conservation Objectives.

MARINE PROTECTED AREA NETWORKS

Spatial management approaches, including the national system of marine protected areas required by Canada's *Oceans Act*, will be a major tool for providing the necessary risk adverse integrated management. The explicit criteria for ecologically significant areas, species, and community properties are facilitating planning of a "network" of marine protected areas which, when linked, achieve a better and more focused ecological outcome than would be achieved by individual marine protected areas. Individual members of the network may address priority Conservation Objectives linked to several significant ecosystem features, for example a site that may meet several area-based criteria for significance, and meet those criteria because of the presence and use by species that also meet species-based criteria for significance. However, the network ensures that sites serving the full spectrum of Conservation Priorities receive spatially-based protection, and ecologically significant species with complex life histories can have multiple ecological requirements served. This poster will present the criteria for significance and for ranking conservation priorities, and illustrate how these criteria can be an effective and objective basis for building a network of marine protected areas that addresses the ecological needs of the planning area in a systematic way

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12. MARINE PROTECTED AREAS – COVERAGE AND GAPS

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Keywords: Marine protected areas, biogeography, gap analysis, continental shelf

THE CHALLENGE

In 2004 all nations signatory to the Convention on Biological Diversity (CBD) agreed to establish “comprehensive, effectively managed, and ecologically representative national and regional systems” of marine protected areas (MPAs) by 2012 (Convention on Biological Diversity 2004). Such actions were further endorsed by a broad international array of scientific, advocacy, policy and management groups in the outputs of the World Parks Congress (Durban Accord and Durban Action Plan) with more specific recommendations (Recommendation V.22) that, among other things, strictly protected areas should “amount to at least 20-30% of each habitat” (IUCN 2005). Remarkably, no detailed attention was given in either of these calls to the determination and analysis of how the term “representative” might be defined.

Terrestrial work in this field has used either biogeographic classifications (Chape et al. 2003) or direct habitat/landcover measures (Chape et al. 2008) but in the marine realm assessment of protected areas coverage has been hampered by the lack of any global dataset describing the coverage of either habitats or biogeographic patterns. The urgent need for such data is clearly underlined by the growing number of regional efforts that have taken place precisely to address this gap (for example, Dinter 2001, Thackway and Cresswell 1998, Wilkinson et al. 2006).

IMPROVED GLOBAL DATA

A new global biogeographic classification of coast and continental shelf waters was recently published (Spalding et al. 2007) which has drawn extensively on existing regional biogeographic classifications. This is a hierarchical classification, dividing these waters into 232 ecoregions, nested into 62 Provinces and 12 realms, with each rank representing increasing levels of ecological and evolutionary isolation, and hence increasing numbers of unique species and assemblages. Work is underway to develop similar classifications for deep sea benthic and pelagic habitats.

The most comprehensive global data source on the coverage of protected areas is the World Database on Protected Areas (WDPA), which now incorporates the extensive review of marine protected areas undertaken through the Sea Around Us Project and the University of British Columbia. The WDPA is a joint project between UNEP World Conservation Monitoring Centre, who hold and manage this dataset, and the IUCN World Commission on Protected Areas.

Here we present an initial overview of the findings arising from combining these two datasets: a first ever global assessment of marine protection from the perspective of “representative” biogeographic coverage.

GLOBAL MARINE PROTECTED AREAS COVERAGE

Initial results show the following:

- Almost all MPA coverage is restricted to areas of national jurisdiction (Exclusive Economic Zones or territorial waters), most are restricted to continental shelf areas, or to a narrow coastal strip.
- On the shelf (above 200m depth) the global coverage of MPAs is below 4%.
- Even such a figure greatly exaggerates the area of strict protection and likely includes many “paper parks” that offer little true protection to ecosystems because of factors including: weak legal frameworks; poor enforcement; lack of community support; and *ex situ* influences such as pollution which may be more widely linked to failures in wider watershed and seascape management,
- There is considerable regional variation in levels of protection. Realm summaries are provided in Table 1. Protection is greatest in the tropical realms, while temperate realms, particularly in the southern hemisphere are very poorly represented.
- At finer resolution more complex patterns emerge. One third of all provinces have less than 1% protection. Some 32 (14%) ecoregions have no recorded MPAs, while a further 93 (40%) offer less than 1% protection.
- In 18 (8%) ecoregions, including the Great Barrier Reef, Hawaii and the Galapagos, more than 30% of the total shelf area falls within an MPA.

These results point to the urgent need for dramatic action to increase levels of marine protection in all realms and in almost every ecoregion if the 2012 target is to be met, or even approached. Priorities must include all ecoregions where protection is currently below 1% and particularly where entire provinces, rich in endemic species and unique communities, have such low levels of protection. In general temperate realms, notably in the southern hemisphere require urgent attention. The few cases where large-scale marine protected areas have been established provide valuable examples pointing both to potential approaches for taking marine protection efforts to scale and to illustrate the social and economic development and security benefits which may be derived from marine protection.

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TABLE 1: Summary of MPA coverage by realm. Note that these figures refer to shelf areas above 200m depth only.

REALM	TOTAL SHELF AREA ('000 KM ²)	TOTAL MPA AREA ('000 KM ²)	PROPORTION OF SHELF PROTECTED
Arctic	7,444	276	3.7%
Temperate Northern Atlantic	3,887	93	2.4%
Temperate Northern Pacific	3,030	74	2.5%
Tropical Atlantic	2,175	106	4.9%
Western Indo-Pacific	2,069	35	1.7%
Central Indo-Pacific	5,815	328	5.6%
Eastern Indo-Pacific	145	27	18.7%
Tropical Eastern Pacific	256	24	9.4%
Temperate South America	1,579	4	0.3%
Temperate Southern Africa	284	3	1.2%
Temperate Australasia	986	38	3.9%
Southern Ocean	449	12	2.8%
Grand Total	28,118	1,020	3.6%

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GOVERNANCE, PARTICIPATION, EQUITY AND BENEFIT-SHARING

13. WADI ALLAQI THROUGH BEDOUIN EYES

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Keywords: Indigenous knowledge (IK), IK documentation, Allaqi, Bedouins, Ababda and Beshari, intellectual property rights (IPR)

WHAT IS WADI ALLAQI?

Wadi Allaqi Site Description

Wadi Allaqi, which lies about 180 km south of Aswan City, is one of the most extensive drainage systems in the Nubian Desert in Egypt. It extended from Lake Nasser southeast toward Sudanese Land. The Wadi extends about 270 km in Egypt and more than 60 km in Sudan. Geologically and ecologically the wadi is divided into three main parts: downstream (areas around the lake), midstream and upstream (south part of wadi). Wadi Allaqi (23,000 km²), one of the largest wadis in Egypt's southeastern desert, was declared a conservation area in 1989 and has protected status since then within the Egyptian Environmental Affairs Agency (EEAA). Because of its arid environment and combination of two ecosystems (extreme arid desert and the shores of Lake Nasser) inhabited by nomadic tribes, this area was designated a biosphere reserve in 1993 within the UNESCO Man and Biosphere Programme (MAP).

Wadi Allaqi Inhabitants

Wadi Allaqi is inhabited by two tribes, the *Ababda* and the *Bishari* Bedouins, both of which are assigned to the *Beja* cultural groups (Briggs *et al.* 1999). The *Beja* are a people of Hamitic origin distributed along the Red Sea coast between southern Egypt and the Horn Africa. The *Ababda* have lived in the Eastern Desert of Egypt since at least the sixteenth century (Arnell 1955, Paul 2000). The small and scattered nomadic and semi-nomadic population live in Wadi Allaqi. The inhabitants of the downstream part live along the lakeshore and shift their settlements according to fluctuations in the lake level. The population in the upstream part of the wadi is *Bishari*, who came originally from Sudan and depended on the rains and wells as a source of water, thus the population fluctuated with rainfall opportunities in the surrounding desert (Seligman 1959). The last population estimate of Bedouins in Wadi Allaqi Biosphere Reserve conducted by the EEAA in the period 2003 to 2004 indicated that their number reached nearly 600 people, distributed only in the down and upstream parts of the wadi. This number does not represent the actual population of nomads in Allaqi that are mobile and usually move in and out of the reserve depending on grazing opportunities.

INDIGENOUS KNOWLEDGE: THREATS AND CONSERVATION

Bedouins in Wadi Allaqi have lived in contact with their environment for hundreds of years and have developed an understanding of the ecosystem in which they lived through trial and error. Their knowledge is based on experience, often tested over centuries of use, adapted to the local culture and environment, embedded in community practices, relationships and rituals held by individuals and communities. Although wide, Bedouin knowledge is focused on animal husbandry and ethnic veterinary medicine, breeding strategy, livestock characteristics and requirements, plant use to treat common illness, classification systems of plants, animals, soils, water and weather and gathering of wild food.

Unrecorded Bedouin knowledge is exposed to several constraints that may threatened it, such as 1) rapid population growth, reduction in resources and new technologies which caused the disappearance of indigenous knowledge; 2) compulsory governmental migration of some Bedouin tribes to new areas where their

local knowledge is no longer relevant; 3) environmental changes such as climate change, widespread drought conditions and land degradation that challenge the adaptability of local knowledge systems; and 4) Rapid commercialization and economic shocks may also undermine local knowledge. Also, creators and keepers of material do not have complete control over it, and the knowledge is only a tool for them to live (Ngulube 2002). It is common that some Bedouins are not willing to share their indigenous knowledge with others even from their community, as they consider their knowledge something special that can sometimes be a source of income.

Our poster illustrates Bedouin knowledge of:

- Desert and medicines.
- Fodder from water.
- *Shamlla*.
- Water scarcity.
- Conservation through rules.
- Stares instead of campus.
- Leather as a valuable material.
- Acacia as a key to livelihood.
- Mapping through nominations.
- Grazing and traces.

This knowledge and more is being lost. The reasons why and the ways to protect it are answered in the poster.

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14. POSSIBLE EFFECTS OF CLIMATE CHANGE ON THE IN-SITU CONSERVATION OF IRVINGIA SPECIES IN NIGERIA

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Keywords: NACGRAB – National Centre for Genetic Resources and Biotechnology, ICRAF – International Centre for Research in Agroforestry, CENRAD – Centre for Environment, Renewable natural resources, Management Research and Development.

The National Centre for Genetic Resources and Biotechnology, Moor-Plantation, Ibadan, Nigeria was established by decree 33 of 1987 to act as the focal point for the country on issues relating to the conservation, utilisation and management of genetic resources. The centre is rich in diverse flora and fauna of medicinal, aromatic and pesticidal value, all totalling about 12,500 accessions in both the short-term and long-term storage facilities.

In the centre's field genebank, domestication of *Irvingia* species (*gabonensis* and *wombulu*) started as a collaborative project between CENRAD/ICRAF/NACGRAB in the year 2001; other collections can be found at Onne and in eastern Nigeria. However, future assurance for its sustainable conservation for over the long term depends on many factors, such as the recent global warning effects of climate change.

Climate change is one of the most critical global challenges of our time.

Recent events have emphatically demonstrated the growing vulnerability of the United Nations to climate change. Its impacts include changes to agriculture—further endangering food security—sea-level rise and the accelerated erosion of coastal zones, increasing the intensity of natural disasters, species extinction and the spread of vector-borne diseases. Recent efforts have been geared towards assessing the impacts of and adaptation to climate change in multiple regions and sectors, so as to enhance scientific and technical capacities in over 45 countries, mostly in Africa.

Due to its high level of biodiversity and genetic resources, Nigeria, however, needs to study critically the effects of climate change on its in-situ conservation status, especially on its economically valuable crops, such as *Irvingia* species. This will allow for a proper understanding of the way to tackle this problem for the sake of immediate and future uses, to avoid the loss of genetic resources and biodiversity, which might eventually lead to hunger and non-availability.

Irvingia species is a dicotyledonous economic tree crop that has various uses, notably for soup-making; the fruit can also be eaten raw. It is rich in vitamins, fats and oils, and has other economic and medicinal uses. Investigations into adequate utilisation of *Irvingia* species has not been well harnessed, especially using modern molecular tools. Subsequent work into the untapped genetic resources and potential of *Irvingia* species will be carried out, thus revealing some phytochemical constituents and thus utilisation of this all important economic tree crop .

This problem and its possible effects can be efficiently addressed with recent molecular tools, such as Marker Assisted Selection (MAS), Geographic Information Systems (GIS) for our agricultural practices, conservation and improved breeding programmes.

15. TRAINING NEEDS ASSESSMENT IN PARTICIPATIVE APPROACH AND RATIONAL USE OF NATURAL RESOURCES AMONG THE GAME GUARDS IN THE DJA BIOSPHERE RESERVE, CAMEROON.

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Keywords: training needs, natural resources, game guards, Dja Reserve, co-management

INTRODUCTION

The institutional review of the forestry sector in Cameroon in 2001 highlighted a certain number of deficiencies in the training and course content of the forestry and wildlife schools leading to the redefinition of training needs in sectors directly related to the application of the forestry policy, while keeping in focus the specific needs of each ecological zone (Savannah, Dense forest, Montane forest, etc). These have led to the suggested reform of the course content, duration and specialisation, in the Mbalmayo Forestry and the Garoua wildlife schools (Peltier & Njoukam 2006a, b). The two schools train people who are affected as game guards in Parks and reserves in Cameroon.

This study aims (1) to assess needs of game guards in the domain of participative approach and rational use of natural resources in the Dja biosphere reserve, and (2) to discuss these needs with the new compulsory course of the Mbalmayo Forestry School.

MATERIALS AND METHODS

The Dja Biosphere Reserve is located in the East and South Provinces of Cameroon, between 2°50 and 3°30 latitude North, and 12°20 and 13°40 longitude East. It covers an area of 5,260 sq. km and is classified among the largest protected areas of the Guinea-Congolian tropical rain forests (Gartlan and Leakay, 1988). The reserve is bound by the Dja River which constitutes its natural boundary, except in the southeast. The major ethnic groups, the Bantus and the Baka Pygmies live side by side in and outside the reserve.

Semi-structured and direct interviews were conducted among game guards, the conservator and the deputy conservator, and representatives of local communities based in the South (Djoum) and west (Meyomessala) of the reserve between August and October 2006. Questions focused on training (knowledge) and skills of game guards, their daily work (activities) and the interactions with local people. To explore more the relationship existing between the game guards and the forest dwellers, we also discussed with the representatives of local communities which are traditional rulers and “internal elites”. In this paper, “Internal elites” are educated people originating in the village and working in towns. They are, for the Dja reserve, one of the most important components (stake holder) to consider in any process of management, in regard to their influence for local dwellers (Joiris 1996, Joiris & Tchikangwa 1995).

RESULTS AND DISCUSSION

A total of 45 game guards are working in the Dja biosphere reserve. Fourteen (14) out of them (31.1%) were interviewed. Only twenty five percent of the 45 game guards are forest technicians, trained in the Wildlife and Forestry schools of Cameroon. The large proportion of the guards (75%) is not trained in forestry or wildlife, the majority of which have been recruited in 1993 by the Program of conservation and rational utilisation of tropical Forest **ECOs**ystems in Central Africa (ECOFAC).

A SWOT analysis of the competencies of game guards in dealing with issues of co-management of resources, proves that control, repressive anti-poaching and ecological monitoring are the only activities implemented by the game guards on the field. In rare cases however, some of the game guards raise social issues of awareness, environmental education and vulgarisation with the local populations. These findings agree strongly with the results of the work carried out by the ECOFAC Program in 2003, which illustrated clearly that conservation effort by game guards concentrated on the use of repressive methods and road checks to the detriment of social engagement, and education through the raising of awareness (Ngandjui 2006).

An appreciation of the role of game guards by the conservator of the Dja Reserve points out that, game guards are excellent in the use of repressive anti-poaching techniques, and are regrettably mediocre in engaging social dialogue and participatory management. This is so because their training is principally based on technical, biological and repressive approaches to conservation. This assertion was independently confirmed by the representatives of the local communities, who pointed out that they expected essentially three things from the game guards, namely: (1) the need to be properly informed on the issues of forest legislations, hunting, the boundaries of the reserve and who manages what, (2) the need to associate local people in anti-poaching activities since forest dwellers know their milieu better than the game guards and are better placed to identify and denounce none native poachers in their forests, (3) the need for game guards to make concrete proposals on alternative approaches to hunting as a means of reducing the pressure on hunting. It appeared clearly that there is regular tension and disagreement between game guards and local communities about their roles, rights and obligations, and to date, the majority of local populations consider the intervention of game guards in conservation as fatal and unwelcome to their livelihood endeavours. This perception has a profound negative impact on the adhesion of local people to the idea of conservation of the reserve. This difference in interests and the feeling of exclusion among local communities, who see conservators and game guards as intruders, has created a conflict situation. Hence, such conflicts as between: (1) conservators/game guard and commercial exploiters, (2) conservators and local populations, (3) and exploiters and exploiters are common.

The compulsory and specialised courses proposed for the Forestry school of Mbalmayo as to meet up with the deficiencies identified by the institutional review do not address those gaps. In fact, the compulsory courses total to 2842 hours of classes spread over 2 years, with only 58 hours (2%) of the total course allocated to communication (Peltier & Njoukam 2006a, b). Even in the specialised courses at the end of the two year training, there is no mention of participatory techniques in the management of the forestry sector. Four departments have been carved out for advanced studies and further specialisation. Of all these departments, it is only in the department of Economic and forest policies that communication is mentioned as part of the compulsory courses. In addition, none of the specialisation courses in each department offers training on participatory approaches and techniques.

A training needs assessment in the management of wildlife and protected areas in Cameroon (Betti 2005a) has also brought out clearly, not only the inadequacy between the actual needs and institutional expectations (Ministry of Forest and Wildlife, Ministry of Environment and Nature Protection), but also the urgent need to adapt training programmes to recent developments in conservation, with the goal of meeting with the new challenges of sustainable management of natural resources and wildlife (Betti 2005b, 2006). It should be noted, that for game guards, assistant conservators, conservators, planners and policy designers etc, there is the need for them to work with other stakeholders (forest exploiter – commercial and local population).

CONCLUSION AND RECOMMENDATION

Following the above results and taking in account the urgent necessity of consideration of the needs of local communities, we recommend the development of a training program which shall aim to transform the game guards to veritable rural development officers, capable to build the link between the conservation objectives and the necessity of the development of local communities. Such a training program shall include: rural animation, planning, communication, techniques of working in groups (team), conflicts management, valorisation

of biodiversity (bush meat and non timber forest products), rural development (agriculture), ecotourism, usage rights of local communities.

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16. PROTECTING THE FUTURE: CARBON, FORESTS, PROTECTED AREAS AND LOCAL LIVELIHOODS

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Keywords: Reduced emissions from deforestation (RED), protected areas, deforestation, livelihoods, carbon

INTRODUCTION

The current proposals on reducing emissions from deforestation in developing countries (RED) being discussed under the UN Framework Convention on Climate Change (UNFCCC) would have significant implications for biodiversity conservation and associated livelihoods. The potential for RED to deliver multiple benefits for biodiversity conservation, livelihoods and other ecosystem services is well documented, but there are also potential risks for conservation and for the livelihoods of those people dependent on forests or forest conversion. The UNFCCC is concerned with *stabilizing greenhouse gas concentrations* in the atmosphere at a level that prevents dangerous interference with the climate system. Decisions made under UNFCCC can therefore be expected to focus on stabilizing emissions, and not necessarily to make explicit provision for maximizing other benefits of reduced deforestation.

The general principle of RED is that developing countries receive credits from decreasing their deforestation rate in the post-2012 period. Depending upon the exact mechanisms decided upon, protected areas could have a role to play in reducing national-scale deforestation, through strengthening forest protection within existing protected areas, and/or declaring new forest areas. In addition, lessons can be learnt from past experiences with protected area management, regarding successes in reducing deforestation and impacts upon community livelihoods. These findings could inform the development of appropriate mechanisms for RED.

HOW SUCCESSFUL ARE PROTECTED AREAS AT REDUCING DEFORESTATION?

The drivers of deforestation are complex; they vary between regions and over time, and interact. An analysis of the literature has shown that protected areas generally have reduced deforestation rates relative to their surroundings, although large areas of forest may still be lost. A more complex issue which needs to be addressed, particularly in the context of RED, is whether protected areas reduce deforestation overall or merely displace the pressure elsewhere. Due to differing methodologies and classifications, it is difficult to make firm conclusions on the efficacy of different strategies for protected area management in reducing deforestation. It appears likely that strictly protected areas (IUCN categories I to II) are more effective in limiting deforestation than other protected area types. Even where studies have investigated deforestation with regard to IUCN management categories, they rarely consider governance and community involvement, and there is some evidence that community based forest management can also be successful in reducing deforestation. This is an issue that needs further investigation if the potential for RED mechanisms to provide both biodiversity and livelihood benefits is to be assessed.

WHAT ARE THE LIVELIHOOD IMPACTS OF PROTECTED AREAS?

The costs and benefits of protected areas to community livelihoods have been well documented. Costs can range from displacement of local communities and denied access to resources to crop damage; and benefits can include direct revenue from environmental protection and environmental benefits such as watershed protection. A large number of the rural poor rely on forest resources. The social impacts of protected areas are not just important in terms of human rights, but also in influencing the extent to which local communities

clear forests. An analysis of the literature has suggested that the livelihood impacts of protected areas vary according to protected area management strategies and governance, but that methodologies for assessing net livelihood costs and benefits are lacking. Management can provide direct benefits but can restrict access to resources, alter local power structures, and change social/traditional values and behaviours. Strictly protected areas with top-down management structures can have major livelihood impacts and cause conflict between local communities and protected area management. Community management schemes and protected area management allowing sustainable use of forest resources have met with varying degrees of success in terms of provision of livelihood benefits; and have been shown to provide tangible benefits in some cases. However, significant costs can still be incurred by communities if management and institutional capacity is lacking, and issues of governance and tenure are not resolved. Inequitable distribution of livelihood costs and benefits between and within both communities and households is an obvious issue in some cases.

FACTORS FOR CONSIDERATION: PROTECTED AREAS IN THE CONTEXT OF RED

The establishment of RED as a mechanism for avoided deforestation could create an international market or fund for forest carbon. The impact on protected areas and livelihoods will depend upon the national as well as global mechanisms selected. However, an analysis of livelihood costs and benefits in existing forest carbon markets has identified issues similar to those identified for protected area management; including lack of established tenure and the inequitable distribution of resources; particularly for the landless members of society. Increased finance could exacerbate these issues, and there is the potential for the protection of carbon areas to intensify livelihood impacts through a strict 'fences and fines' approach. Alternatively, the potential exists for RED mechanisms to remove the large scale drivers of deforestation, secure land tenure rights in forest areas, and increase the potential benefits to local communities from conservation through community management regimes. Careful consideration of the potential impacts of RED mechanisms based on past experience is therefore required. Involvement of local people in planning and implementation of RED, and ensuring sharing of the benefits from RED finance is likely to result in a more sustainable long-term solution to deforestation.

There is much uncertainty regarding the efficacy of protected areas in reducing deforestation and impacts on local livelihoods, and there is a clear need for a detailed assessment of these factors in order to inform climate change policy. Further study is required into the impact of community management and governance types within protected areas on deforestation rates, and clear methodologies for assessment of livelihood impacts of the various methods of protection are required.

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17. CENTRAL AFRICAN WORLD HERITAGE FOREST INITIATIVE (CAWHFI) FOR BIODIVERSITY CONSERVATION IN THE CONGO BASIN

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Keywords: Central Africa; protected area conservation; bushmeat trade; capacity building & law enforcement; awareness raising; sustainable management; world heritage.

INNOVATIVE ALLIANCE

The Central African World Heritage Forest Initiative (CAWHFI) offers an innovative alliance between national authorities and a group of partners including UN agencies, NGOs, and other bilateral and multilateral bodies active in forest conservation in Central Africa. The CAWHFI partnership brings together the governments of Congo, Cameroon, Gabon and the Central Africa Republic, the World Heritage Center of the United Nations Educational, Scientific and Cultural Organization (WHC-UNESCO), Food and Agriculture Organization of the United Nations (FAO), the World Wide Fund for Nature (WWF), the Wildlife Conservation Society (WCS), Conservation International (CI), Fonds Français pour l'Environnement Mondial (FFEM-*French Global Environmental Fund*), the United Nations Foundation (UNF) and the United Nations Fund for International Partnerships (UNFIP). Each organization offers its own network, experience and expertise to protect three important transboundary forest landscapes, articulated around key protected areas of the Congo Basin.

OBJECTIVES, SCOPE AND ACTIVITIES

CAWHFI seeks to improve the sustainable management of selected clusters of protected areas in three ecological landscapes of the Congo Basin. Its general objective is to “*promote and support the building of management regimes for Central Africa forest protected areas that will satisfy standards befitting World Heritage status and effectively combat the principal threats of illegal hunting and unregulated bushmeat trade*”.

The first component of the initiative was launched in 2004, with a specific objective to improve the protection of the 9 most important national parks of these 3 landscapes by combating illegal hunting and regulating bushmeat trade, strengthening law enforcement and using the World Heritage image to improve protected area management and long-term financing. Its main activities include capacity building of staff members of the national protected areas and wildlife services, providing technical and logistical support, and raising awareness, both at governmental and local level, on the outstanding value of these ecosystems.

The three ecological landscapes of CAWHFI interventions are:

- **Sangha Tri-National (TNS):** a transboundary landscape composed of *Lobeke National Park* (Cameroon), *Dzanga Sangha National Park* (Central African Republic) and *Nouabale Ndoki National Park* (Congo).
- **Tri-National Dja-Odzala-Minkebe (TRIDOM):** a transboundary landscape composed of *Minkebe National Park* (Gabon), *Odzala National Park* (Congo) and the *Dja Faunal Reserve and World Heritage Site* (Cameroon). The Cameroonian part of TRIDOM also includes the newly created *Boumba Bek and Nki National Parks and CAWHFI intervention zones*.
- **Gamba-Conkouati:** a transboundary landscape composed of the *Gamba complex of protected areas* (Gabon), the *Mayumba National Park* (Gabon) and the *Conkouati-Douli National Park* (Congo).

Since 2006, CAWHFI partners obtained an additional grant from the French Global Environmental Facility (FFEM) to extend the programme intervention area to national park peripheral zones (e.g. logging & oil concessions). Seven pilot projects characterized by an innovative approach – *i.e. the establishment of discussion platforms that gather all local stakeholders involved in forest exploitation and management to elaborate and implement sustainable wildlife management schemes* – have been launched. Lessons learnt will be communicated widely, best practices developed and success stories readily replicated in wider forest landscapes.

The FFEM component specifically aims to (1) build capacity in the surroundings of protected areas to allow common-based wildlife resource management; (2) elaborate wildlife management plans for these areas with all local stakeholders (including the private sector operating concessions located around protected areas); (3) implement and monitor wildlife management plans.

MAIN ACHIEVEMENTS

In a region characterized by increasing environmental pressures related to sprouting extractive industry projects and running demography, CAWHFI capacity building and law enforcement efforts significantly contributed to the conservation of critical populations of flagship species such as elephants, gorillas, hippos, etc. Strong working relations have been developed with local stakeholders, including private sector operators and local administrations to promote the sustainable management of natural resources at landscape level. CAWHFI partners also contributed to the creation of the Tri-National Sangha Trust Fund. This Fund is the first initiative of Central Africa that aims to provide sustainable financing for conservation activities. Awareness raising campaigns and technical support provided by CAWHFI during the elaboration of the Lopé-Okanda nomination dossier led to the inscription of this national park on the World Heritage List.

BUILDING CONSTITUENCY FOR WORLD HERITAGE

The ultimate goal of the CAWHFI programme is to achieve the sustained conservation of protected areas of “Outstanding Universal Value” through World Heritage inscription. When inscribing a property on the World Heritage List, governments make a firm commitment towards the international community to protect and conserve the values, integrity and authenticity of this property. CAWHFI partners work closely with national authorities to communicate and raise awareness at the local, national and international level, about the exceptional natural value of CAWHFI intervention sites. Emphasis is put on the opportunities to value these protected areas while building national pride for natural legacy. UNESCO also promotes the adoption of an integrated land-use planning system by government partners, including all major national administrations (e.g. forests, mines, tourism, culture, etc.), coherent with World Heritage priorities expressed by the governments. Upon governments’ request, the World Heritage Fund shall also help State Parties develop nomination dossiers in view of the sites’ inscription on the World Heritage List.

PERSPECTIVES

Results achieved during the first two years of the programme led to increased regional recognition and governmental support. CAWHFI partners will pursue capacity building efforts of national park and wildlife services to raise protected area management standards at levels befitting world heritage status.

Partnerships with private sector operators will be further developed to improve the sustainable management of natural resources at landscape level. Education, notably on the outstanding value of the ecosystems, and ecotourism activities should improve perspectives for local communities and show them the added value of well-managed protected areas. CAWHFI results and lessons learnt will be communicated widely.

ACKNOWLEDGEMENTS

The United Nations Foundation (UNF) contributes to the original CAWHFI programme through a USD 6.6 million grant; 50% of which is provided as third-party matching funds by the implementing NGOs.

The Fonds Français pour l'Environnement Mondial (FFEM) provides EUR 2.5 million for the second CAWHFI component that focuses on landscape management in partnerships with private sector operators.

18. FACTS AND FIGURES ON PROTECTED SITES IN HUNGARY

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Keywords: Protected sites, Natura 2000 sites, designation, ownership, land-use

The principal objectives of Hungarian nature conservation policy are defined by Act 53 of 1996 on Nature Conservation (Nature Conservation Act) and are laid down in the successive National Environmental Programmes. The current National Environmental Programme was adopted in 2003 by a resolution of Parliament for the period of 2003-2008 (NEP II). It contains, as an integral part thereof, a so-called National Nature Conservation Master Plan (Master Plan). The Master Plan is complemented by a National Biodiversity Strategy and Action Plan, drawn up for the period of 2004-2010, in accordance with the Convention on Biological Diversity.

The main policy objectives of the Master Plan are as follows:

- Continuous development of the network of protected natural areas;
- Expansion of the area of protected land directly managed by nature conservation agencies;
- Full transposition and implementation of the *acquis communautaire* on nature conservation;
- Full implementation of Hungary's other international obligations in relation to international conventions;
- Integration of the principles of nature conservation and landscape protection into the operation of other sectors utilising natural resources, particularly through the National Ecological Network;
- Harmonisation of the utilisation of natural resources with the requirements of sustainability.

PROTECTED SITES

The proportion of Hungary's protected natural areas grew to 9.44% of the country's area – 10.36% including the registered, 'ex lege' protected bogs, mires and sodic lakes – by 2006. The size of nature conservation areas has grown the most during 2006. Ten national parks, 36 landscape protection areas, 152 nature conservation areas and 1 natural monument – all qualified as protected natural areas of national significance protected by specific regulations – existed in Hungary on 31 December 2006. Hungary plans to increase the total area under protection by 180,000 hectares in the next 10 years.

After the accession of Hungary to the European Union, the Natura 2000 network – which forms part of the National Ecological Network and also protected to some extent – was established. Special provisions and restrictions apply to the areas of this network, which facilitate the protection and conservation of these areas (55 special protection areas and 467 proposed sites of Community interest show a 38% overlap with the protected natural areas of national relevance). The proportion of the protected natural areas of national relevance is 839,000 ha (9.6% of the total area of the country) (see Table 1).

OWNERSHIP OF PROTECTED SITES

In general, a key issue in the implementation of the nature conservation objectives is the ownership, management and use of protected natural areas. In view of the inherent conflict between the interests of land owners and those of the preservation of habitats and species, one of the basic objectives of nature conservation with regard to ownership is to increase the proportion of protected natural areas in state ownership, and managed by nature conservation authorities (national park directorates). This objective is typically implemented by land purchases (appropriations) and by the transfer of management rights to the authorities.

Table 2 illustrates the results and directions of implementation. Land purchases for the purpose of nature conservation (purchase by the state and transfer to the management of national park directorates of protected areas and areas proposed for protection, which were previously used by co-operatives), which started in 1996 pursuant to Act XCIII of 1995 on the Restoration of the Level of Protection of Protected Natural Areas, largely contributed to the success of this process. According to that Act, another approximately 100,000 hectares of lands are expected to be purchased by the state. Furthermore, the transfer of the management rights of state-owned areas previously managed by other agencies, such as the Ministry of Defence and water authorities to the national park directorates represent an important achievement.

TABLE 1: Protected areas and Natura 2000 sites in Hungary, 1975–2006

YEAR	NATIONAL PARKSA	OTHER PROTECTED AREAS	TOTAL	NATURA 2000B
1975	88000	39000	127000	-
1980	127000	303000	430000	-
1985	147000	349000	496000	-
1990	147000	482000	629000	-
1995	178000	526000	704000	-
2000	441000	375000	816000	-
2001	441000	375000	816000	-
2002	484000	336000	820000	-
2003	484000	336000	820000	-
2004	484000	344000	828000	1968000
2005	486000	353000	839000	1968000
2006	486000	353000	839000	1968000

a) All numbers rounded up to thousand hectares

b) Overlaps with total of protected areas (i.e. most of the protected sites are Natura 2000 sites as well)

TABLE 2: Ownership of Protected Sites

	AREA OF SITES PROTECTED BY LAW	AREA OF SITES IN STATE OWNERSHIP	AREA OF PROTECTED SITES MANAGED BY NATIONAL PARK DIRECTORATES
	<i>Hectare</i>	<i>Hectare</i>	<i>Hectare</i>
1990	595,044	345,919	20,478
2002	820,628	545,992	199,620
2005	839,019	633,618	239,192
2006	839,031	635,365	242,189

Source: Ministry of Environment and Water

TABLE 3: Land use in nationally protected areas, 2006

	NATIONAL PARKS	PROTECTED LANDSCAPES	NATURE RESERVES	TOTAL
Forest	42%	54%	44%	47%
Meadows and grasslands	28%	23%	27%	26%
Arable land	11%	14%	6%	12%
Land set aside from agriculture	13%	7%	14%	11%
Reeds	3%	1%	4%	2%
Fish ponds	1%	1%	4%	1%
Vineyards	1%	0%	1%	1%
Gardens	<1%	<1%	<1%	<1%
Total	100%	100%	100%	100%

Source: Ministry of Environment and Water

19. ABORIGINAL PEOPLES AND CANADA'S PARKS AND PROTECTED AREAS

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Keywords: indigenous communities, traditional knowledge, cooperative management, protected areas planning and management, cultural resources

INTRODUCTION

Canada's federal, provincial and territorial park agencies have developed, in consultation with relevant aboriginal communities, a compendium of 25 case studies that illustrates best practices in the participation of Aboriginal people in protected areas planning and management, and provide insights into enhancing collaborative relationships between parks agencies and Aboriginal peoples.

HISTORICAL CONTEXT

In 1975, the James Bay Crees, the Inuit of Quebec and the governments of Quebec and Canada signed the *James Bay and Northern Quebec Agreement* – the first of Canada's modern day land claim agreements. This agreement marks the beginning of a thirty-year history in the evolving participation of Aboriginal people in protected areas in Canada. It established the first of what are now referred to as “co-management bodies” – with a broad range of shared management responsibilities. Every modern day land claim agreement since has contained similar types of provisions, as well as provisions for the inclusion of traditional knowledge in decision-making, preferential economic opportunities for area communities, and a strong role in park conservation management and planning. Collectively these agreements in Quebec, Labrador, Nunavut, Northwest Territories, Yukon and British Columbia have changed the way protected areas are established, planned and managed in Canada. They have greatly altered the relationships between Aboriginal people and federal, provincial and territorial governments, and created a framework and a growing body of experience that Aboriginal people and parks agencies are exploring and applying. Even when these relationships are not codified in modern day land claims agreements, other less formal understandings and arrangements are strongly informed by traditional ties and relationships of Aboriginal people to their traditional territories.

CASE STUDY THEMES

Six themes have emerged from the development of these case studies – each representing an area where leading work is being done cooperatively between park agencies and Aboriginal communities:

Co-operative Involvement in Park Planning and Management – The case studies highlight the diversity of park agency - aboriginal community partnerships in the planning and/or management of individual parks, Canadian Heritage Rivers, National Historic Sites and World Heritage Sites.

Participation in Landscape Planning and Protected Areas Network Planning Initiatives – Aboriginal peoples are using community-based land use planning processes as a means to articulate and implement their vision for the sustainable use and protection of their traditional land. These processes are often slow, complex, involve many jurisdictions and stakeholders, and lack necessary funds. Despite these significant barriers, the case studies demonstrate significant opportunity for success.

Park Interpretation Activities and Tourism Ventures – Aboriginal communities are advancing tourism ventures within parks both as a means to provide economic benefits to their communities and to showcase world-class natural and cultural resources. The case studies highlight the priority being placed on ensuring an accurate expression of the communities' cultural traditions and safeguarding the ecological integrity of the park's natural resources. These projects are providing a means to nurture and improve relations between the park agencies and Aboriginal communities, and are further helping to instill a greater sense of ownership and expression of cultural heritage by those communities.

The role of Culture and Traditional Knowledge in Park Planning – Aboriginal peoples have developed complex relationships with the lands they have occupied for countless generations. In the past, traditional "science-based" models of park planning and management provided little opportunity to benefit from the traditional knowledge of Aboriginal peoples. Today, park agencies and aboriginal communities are involved in leading edge work that takes a fundamentally different approach to park planning - one based on the recognition of the significance of a landscape's cultural resources as key reference points in the way in which these people view and associate with the land. These cultural resources are being catalogued and used as the cornerstone to park planning and management.

Parks as Cultural Learning Opportunities for Aboriginal Youth – In many of Canada's aboriginal communities, concerns are being expressed about the declining interest of youth in land-based activities and the resulting loss of community traditions. These case studies highlight important efforts being made to ensure meaningful land-based learning opportunities for Aboriginal youth.

Capacity Building – Increasing opportunities exist for the hiring of staff from Aboriginal communities in park planning, management, and tourism. Several case studies profile innovative, on-the-job training programs designed to develop knowledge, skills and leadership qualities.

INSIGHTS

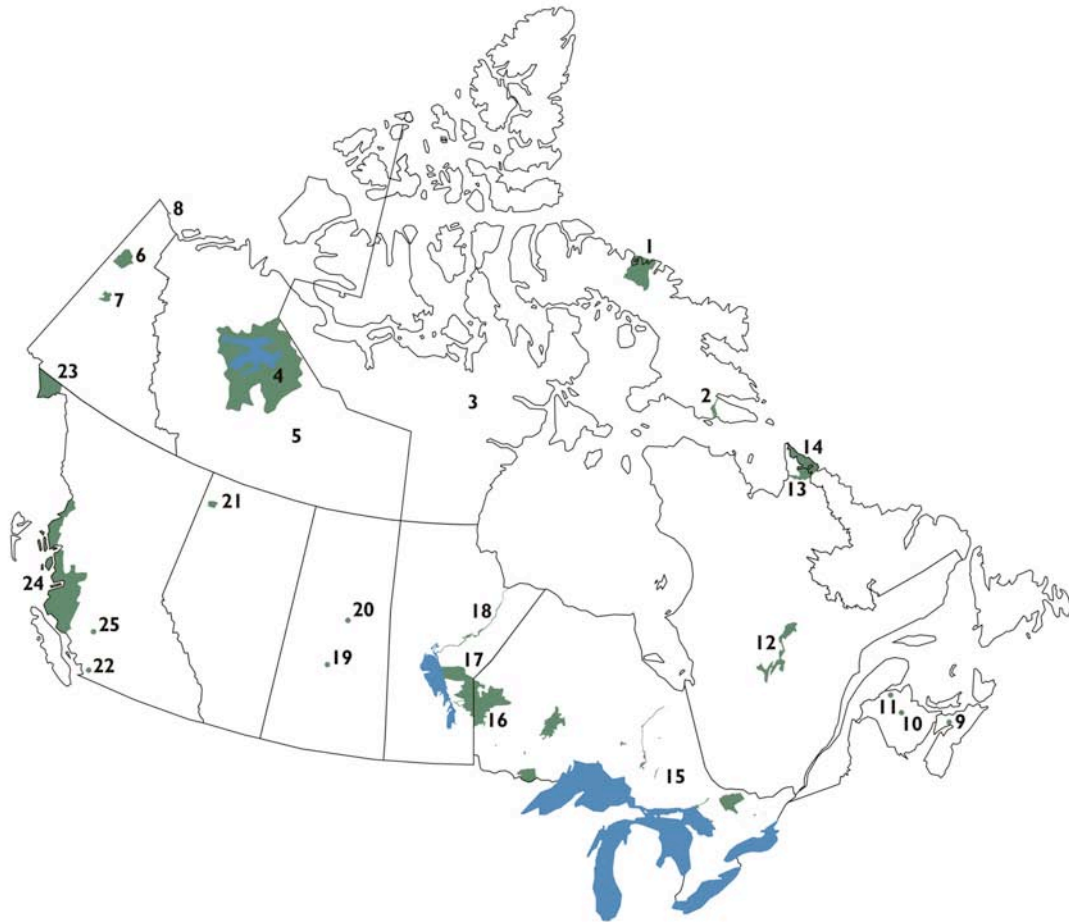
Park agencies identified three main factors to the success of the initiatives highlighted in the case studies:

- Community leadership in articulating a vision for the sustainable use and protection of their traditional lands
- Time, patience, trust and dedication in developing and nurturing a meaningful partnership between the park agency and the Aboriginal community(ies)
- Recognition of the importance of cultural resources and traditional knowledge as an expression of Aboriginal peoples history and relationship to the land

OPPORTUNITIES AND CHALLENGES

Park agencies are increasingly recognizing the special contributions that Aboriginal communities can make to Canada's protected areas, and in particular the traditional knowledge that Aboriginal people have of landscapes, wildlife populations and cultural heritage. At the same time, cultural differences between Aboriginal peoples and institutions affect how management issues are approached and resolved. In many regions of the country, significant capacity issues facing Aboriginal communities represent major barriers to fulfilling new opportunities. The diversity of park management arrangements and Aboriginal cultures requires individualized approaches to cooperative park planning and management. And because protected areas boundaries often overlap jurisdictional boundaries, inter-jurisdictional cooperation and management are usually complicated. These are areas that will require attention in order to strengthen and develop the relationship between Aboriginal people and parks agencies. The case studies provide an important foundation for enhancing this relationship through the positive lessons that have been learned.

Aboriginal Peoples & Canada's Parks and Protected Areas Map of Properties Profiled in Case Studies



- | | |
|--|---|
| 1. Proposed Clyde River Territorial Park, Nunavut | 14. Torngat Mountains National Park Reserve, Newfoundland and Labrador |
| 2. Katannilik Territorial Park, Nunavut | 15. Aboriginal Youth Work Exchange Program, Ontario |
| 3. Inuit involvement in park planning, Nunavut | 16. Whitefeather Forest Planning Area, Ontario |
| 4. Great Bear Lake watershed, Northwest Territories | 17. Pimachiowin-Aki World Heritage Site initiative (Ontario and Manitoba) |
| 5. Aboriginal Involvement in the Protected Areas Strategy, Northwest Territories | 18. Hayes River Canadian Heritage River, Manitoba |
| 6. Ni'iinlii'Njik (Fishing Branch), Yukon | 19. Fort Carlton Provincial Park, Saskatchewan |
| 7. Tombstone Territorial Park, Yukon | 20. Lac La Ronge Provincial Park, Saskatchewan |
| 8. Qikiqtaruk (Herschel Island) Territorial Park, Yukon | 21. Hay-Zama Wildland Provincial Park, Alberta |
| 9. Mi'kmawey Debert Cultural Centre, Nova Scotia | 22. Say Nuth Khaw Yum Heritage Park/ Indian Arm Provincial Park, British Columbia |
| 10. Metepenagiag Heritage Park, New Brunswick | 23. Tatshenshini-Alsek Park, British Columbia |
| 11. Aboriginal Heritage Gardens, New Brunswick | 24. Coastal conservancies, British Columbia |
| 12. Proposed Albanel-Témiscamie-Otish Park, Québec | 25. Ts'il'os Provincial Park, British Columbia |
| 13. Kuurujuaq Park, Québec | |

20. PROTECTED AREAS AND LIVESTOCK KEEPERS' RIGHTS

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Keywords: Biodiversity, pastoralism, LIFE-Network, livestock keepers' rights

INTRODUCTION

In many countries, such as India, protected areas are one of the major factors forcing pastoralists to abandon their traditional way of life, stop keeping livestock, and migrate to cities. This scenario does not only lead to the loss of rural livelihoods and of traditional ecological knowledge, it also undermines domestic animal biodiversity, as well as plant biodiversity and wildlife. The LIFE-Network in India has drawn attention to the fact that closure of protected areas is implicated in the erosion of several local breeds and species, including the camel (Köhler-Rollefson and the LIFE-Network). This is incompatible with the objectives of the CBD, especially its article 8j which mandates to respect, preserve and maintain traditional lifestyles relevant for the conservation and sustainable use of biological diversity.

PASTORALISTS HUSBAND BIODIVERSITY

Pastoralism has positive interlinkages with many components of biodiversity, including domestic and wild animal diversity, as well as plant biodiversity and landscape or eco-system diversity. Pastoralists have created a disproportionate number of livestock breeds, including a large number of transboundary breeds, in the Indian subcontinent (FAO, 2006). Furthermore, pastoralists' herds retain many of the genetic traits that were present in the wild ancestors of domestic animals, but have been selected against in high performance breeds and have disappeared from their genetic make-up. These include for instance disease and drought resistance, certain behavioural traits, and general hardiness. Pastoralism is regarded as reservoir for livestock genetic diversity that may become highly valuable in times of climate change (Köhler-Rollefson and LIFE-Network, 2007)

With respect to wildlife, there are many examples from India which demonstrate how the conservation of wild animals, especially predators, hinges upon the presence of pastoralist livestock (Lewis, 2003; Köhler-Rollefson and Life-Network, 2007). In Rajasthan's Kumbalgarh Wildlife sanctuary, leopards and wolves prey almost exclusively on sheep and goats. In the Gir Sanctuary for the Asiatic Lion in Gujarat, lions depend on pastoralist livestock for part of their diet and when pastoralists were evicted from the sanctuary, this resulted in an exodus of lions which followed their prey (Casimir, 2001). In Rajasthan's Desert National Park, created especially to save the Great Indian Bustard, restriction on livestock decreased the dung and thereby the insect population on which the bird exists – remaining populations are associated with livestock (Changani, pers. comm.).

In Europe, it is now widely recognised that grazing by livestock has shaped many favourite cultural landscapes. In Germany, the introduction of stall-feeding has changed the look of forests which earlier were grazed by village livestock. In the absence of such use, certain shrubs, such as blackberries have proliferated and prevent the rejuvenation of the large forest trees. Reintroduction of grazing has become a well-established method for landscape management that is supported by the Federal Nature Conservation Agency. Examples include the use of goats for controlling blackberry growth, use of sheep for keeping vegetation open and maintaining nesting habitats for migratory birds, or use of controlled grazing by sheep, cattle, and donkeys to re-establish sand-dune vegetation (Redecker et al., 2002).

CASE-STUDY: KUMBALGARH SANCTUARY

The Kumbalgarh Wildlife Sanctuary in Rajasthan was established in the 1970s to protect leopards and wolves, among other species. Since before Independence, the area served as the traditional summer grazing ground of the semi-nomadic and nomadic Raika pastoralists who have developed a number of famous livestock breeds (Fig.1). In 1999, forest protection committees were established which decided to ban all non-local animals from the forest – a major blow to the nomadic Raika who could not claim to be local. In a public interest writ petition filed at the Rajasthan High Court in 2002, the NGO LPPS requested grazing rights to be reinstated, referring to the dependence of camels on the forest as summer grazing ground, and the ensuing threat to the survival of the local breed of camel. This case was decided in favour of the camel breeders in 2003. But in August 2004, the State Government again refused to issue grazing permits, citing a letter by the Central Empowered Committee (CEC) of 2.7.2000. In response, the Raika requested the CEC to clarify the situation to the Rajasthan Government. Since the CEC never provided a response, the Raika filed another Civil Writ Petition (PIL No.2186 of 2005) in the Rajasthan High Court requesting the State Government to grant grazing permits as before. The State Government referred the case to the Supreme Court which then asked the Chief Wildlife Warden to assess the number and type of domestic animal which could safely be allowed to graze in the sanctuary area without adverse effects. In his reply, the Chief Wildlife Warden states that “..in order to protect one of the last remains of Aravalli biodiversity, it is recommended that grazing should not be permitted in the Kumbalgarh Wildlife Sanctuary area.” Unless the situation is resolved, young Raika will not opt for a career in livestock-keeping, although there are very few exceptions (Fig. 2).

LIVESTOCK KEEPERS' RIGHTS

Livestock Keepers' Rights are a bundle of rights or entitlements claimed by pastoralists and other small-scale livestock keepers for being able to maintain their role in in-situ conservation of domestic animal diversity (<http://www.pastoralpeoples.org/docs/livestockkeepersrights1.pdf>.) Developed by the LIFE-Network in a multi-stakeholder dialogue that spanned seven years, they include the recognition of pastoralists as creators of breeds and the dependency of the sustainable use of traditional breeds on the conservation of their respective eco-systems (Fig. 3 and 4). *Livestock Keepers' Rights* were backed by African and other G77 countries during the negotiation of the Global Plan of Action at the International Conference on Animal Genetic Resources in Interlaken; in the follow-up process, Brazil has urged for further attention to the issue.

CONCLUSIONS

The important role of pastoralist production systems in maintaining domestic animal diversity and providing various eco-system services needs to be fully recognised and rewarded. Unfortunately, at present, the livestock biodiversity nurtured by pastoralists falls through all institutional gaps. Wildlife conservationists scorn pastoralist livestock as “domestic” animals and therefore inimical to the environment and wildlife. Animal scientists on the other hand tend to compare pastoralist breeds negatively with high performance breeds. Conceptually it might be helpful, if we stopped looking at domestic and wild animals as representing a dichotomy. Rather, there is a fluid border between them, and the livestock of pastoralists retains many characteristics of wild animals.

Domestic herd animals do not only enhance the landscape, but they also represent important bio-cultural heritage. However, unless pastoralists and their herds are provided with legally sanctioned recognition and with training and capacity-building support for enhancing their biodiversity enhancing management practices, these age-old systems are doomed to disappear within the span of a few years, at least in India. This will have serious implications for the conservation of animal genetic resources, for rural livelihoods (rural-urban migration), for sustainable crop cultivation and for wild biodiversity.

Currently there are deeply ingrained antagonisms between conservationists and pastoralist interest groups. There is an urgent need for breaking down these borders and engaging in constructive dialogue and “conflict resolution”, maybe learning from some of the examples for successful use of adapted livestock breeds in biodiversity conservation that are present in Europe. Unless activities in this direction are initiated, compliance with respect to paragraph 8j of the CBD is not within reach.

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FIGURE 1: Entering Kumbalgarh Sanctuary



FIGURE 2: Young pastoralists are rare.



FIGURE 3: Appeal for Livestock Keepers' Rights



FIGURE 4: LIFE-Network at Interlaken



21. MECHANISMS OF TERRITORIAL MANAGEMENT WITH COMMUNITIES' NEIGHBORING CORDILLERA AZUL NATIONAL PARK, PERU

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Keywords: Land-use zoning, land-use planning, Cordillera Azul National Park, buffer zone

INTRODUCTION

In recent decades, there has been a change in the concept of the protected area. They have evolved from being a sort of *islands that protect biodiversity without much participation of people who live around or inside of them*; to regional integrated areas where the conservation actions are strongly supported by the participation and commitment of local people (communities and authorities) in the development processes. Achieving this commitment is based on the community's view of environmental services (ecosystem functions) offered by protected natural areas: freshwater supply, soil conservation, climate stability, food, medicines and materials for industry among some of them. Moreover, the biological diversity has also essential cultural values. In addition, protected areas and their buffer zones are considered to generate productive activities compatible with conservation objectives, in the context of management processes for land use planning and zoning.

In that regard, Peru's Center for Conservation, Research and Management of Natural Areas (CIMA) since its establishment in 2002, is implementing a model of participatory management in the 1'353,191 hectares Cordillera Azul National Park (PNCAZ), and its 2'301,117 hectares buffer zone that harbors a rising population of over 100 000 people. The rate of deforestation is dramatically increasing at San Martín Region (the PNCAZ although covers part of Huánuco, Ucayali and Loreto regions) with a high rate of biodiversity loss close and far away of their geographical limits. The maintenance of its biodiversity is a necessary condition for regional sustainable development, and as matter of fact, it constitutes one of the challenges of the management at the PNCAZ's buffer zone.

ACTION STRATEGY

Because of the vastness of Cordillera Azul and its buffer zone, the large number of communities, and the heterogeneous realities, CIMA have prioritized its efforts to work in areas where the greatest number of threats to the integrity of the park have been identified, called "critical areas" (Figure 1). Knowing that threats to the park and its biodiversity require immediate and long-term fundamental changes in the way resources are used – not only inside the park but also in its buffer zone – CIMA has been working on the adjustments of broad-based actions among a wide range of actors (farmers, teachers, local and regional authorities, institutions, others), mainly the Communal Land Zoning, in order to get more compatible conservation activities, and a more equitable distribution of benefits inside the communities.

COMUNAL LAND ZONING

Since 2004, CIMA with the close advice of Dutch Cooperation Service (SNV), has been developing mechanisms for territorial management, sustainable development and appropriation, within PNCAZ's neighboring communities, called "Communal Land Zoning," which takes into account the potentialities and limitations of the territory, communal knowledge and forward-vision of the communities around the park (Figure 1).

TECHNICAL-SCIENTIST AND PARTICIPATORY PROCESS

Communal Land-Use Zoning is framed within the process of Communal Land-Use Planning and Management and it is based on four principles: 1) Self-management and capacity building, 2) participation, 3) Agreement between interests and needs, and 4) A progressive, cyclic and gradual continuity. These principles take precedence over the development of the four-phase-land-use zoning process, which also has a strong technical-scientific, and multidisciplinary component, with the application of geographic information systems (GIS) tool:

PHASE 0: PREPARATION AND APPROACH TO COMMUNITIES

- Selection of communities based upon Social Asset Mapping (Mapeo de Usos y Fortalezas-MUF) and Critical Areas.
- Introduction of Land-use Zoning in the Communal Agenda.
- Development (with the communities) of objectives, scope and methodology of the activity.
- Training of field teams for the work per se.

PHASE 1: DATA COLLECTION

- **Compilation of Participatory information.** This is a social process where the population acknowledges major geographic factors within their environment, developing cartographic and community-based maps, and other information that allows them to perceive a special sense of ownership of the zoning process.
- **Compilation of Technical-scientific information,** this stage is conducted following the methodological ecological-economic zoning regulations (DC N° 010-206-CONAM/CD), which includes the development of base mapping, analysis of satellite information, field studies, and updating of GIS database.

The link between these two lines of work focuses on both interchange and feedbacks, to form a stronger geographic database, accounting social and scientific aspects and validating each other when they are contrasted. In addition, in order to fix in the Ecological and Economic Zoning (ZEE), CIMA began a process of categorizing communities, through participatory demarcation of communal territories, eventually involving dialogue searching and reconciliation between neighboring communities for peacefully solving of boundary issues.

PHASE 2: ANALYSIS AND REFLECTIONS

Demonstrate to local people the developed maps in the previous phases, for feedback and analytical overview of the communal reality: main problems, development aspirations and analysis of land potential. Set up the criteria and guidelines for last phase. It begins with Public Impact (*Incidencia pública*) of the process to get approval from Municipality authorities: the final responsible for administering the territory.

PHASE 3: ZONING AND APPROPRIATION

The GIS studies and modeling, the socialization of the Territorial Scenarios, and the entire process of analysis and reflection with community contribute to create a better understanding of environment's capabilities and limitations. This process addresses to the reconciliation of actors' interests and needs; with full and responsible participation of the Dialogue Groups and whole population, which have reached enough maturity to accept and take over its results.

The usefulness of zoning reinforces peaceful ways to resolve some communal problems and reconciles interests on communal land management and sustainable development, building the Scenario to Management the communal territory.

CONCLUSIONS

- The feasibility of the PNCAZ's protection and the conservation of natural resources are based on the compatibility of the interests between the park and its neighbors, and its shared and continuous management.
- The institutions have a facilitator role, as guide and catalyst of local development, but the community have to be the leaders and responsible for their own welfare.
- The micro-zoning and participatory management should be initiated in communities located in the 'critical areas' of the buffer zone of the PNCAZ.
- The Communal Land-use Zoning pursues the strengthening of organizational communities' structures to practice its functions; and achieve an orderly communal territory along with the population. Against unsustainable use of natural resources and disorderly occupation processes.
- Since the beginning of the process in 2005, the Communal Land-use Zoning activity has generated a tremendous expectations in the communities,, because it reinforces their rights on communal land, appreciation of the forest, and appropriation of the territory.
- CIMA has provided technical support and the database, but also the inclusion of communities in the process, which the participatory zoning process generates knowledge and consensus as the basis for decision-making and land-use planning.
- This participatory process promotes the improving of management capacities for the communities, their residents and competent authorities.

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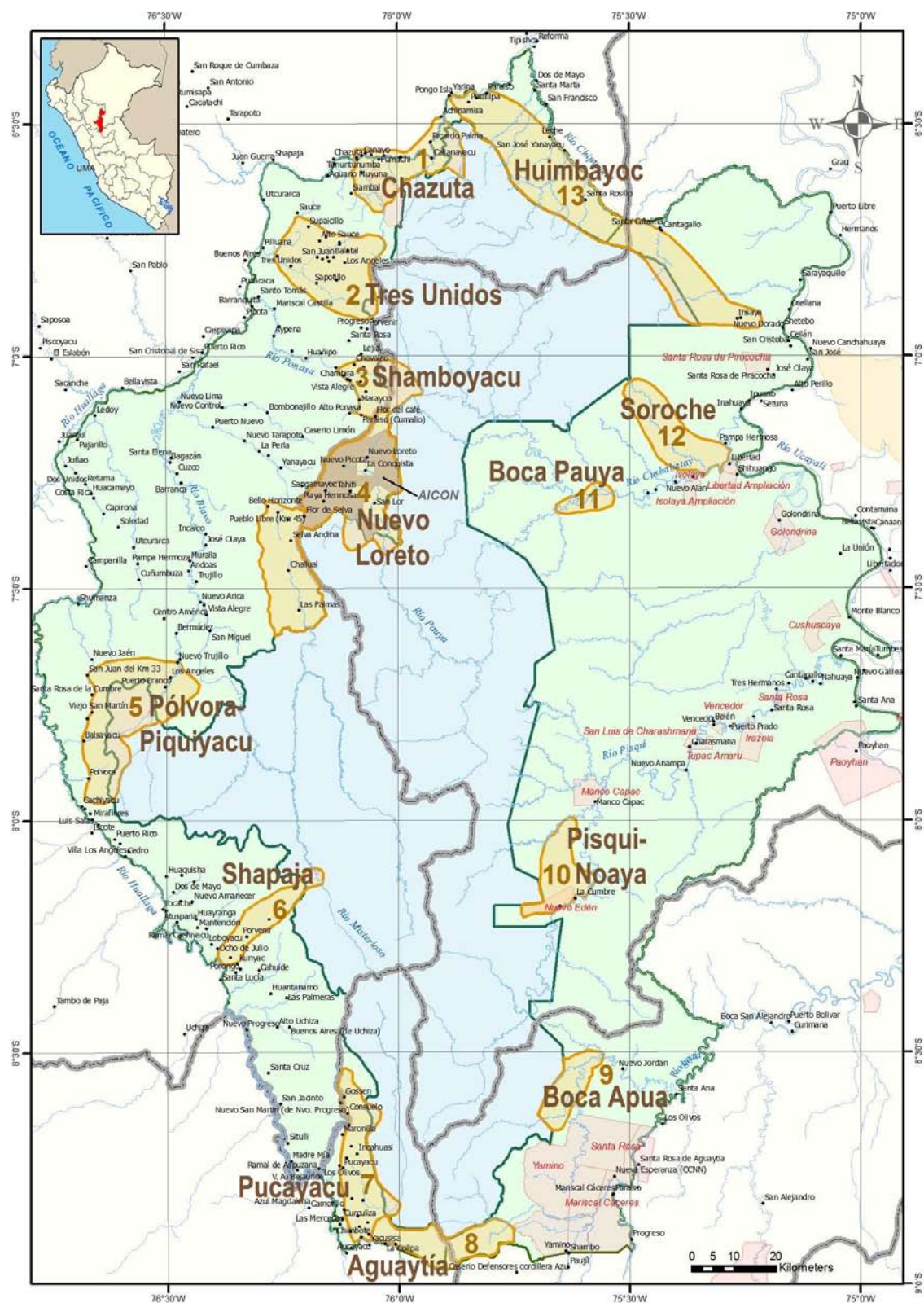
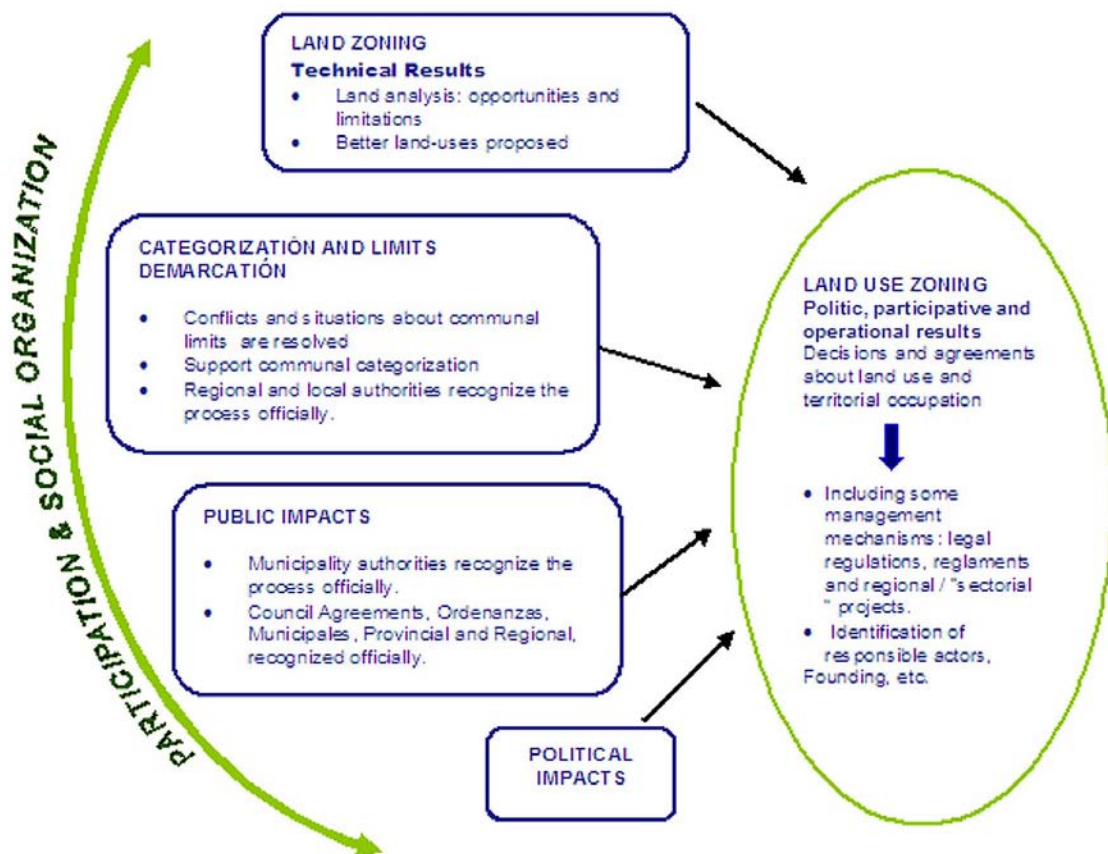


FIGURE 2: The Land-use zoning process implemented by CIMA at the Cordillera Azul National Park's buffer zone.



22. BENEFITS OF PROTECTED AREAS TO HUMAN WELL-BEING

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Keywords: socioeconomic benefits, political will

BUILDING LONG-TERM SUPPORT FOR PROTECTED AREAS

Strong support from governments, civil society and individuals can help unlock the true potential of protected areas to conserve the unique ecosystems and precious natural resources that are the backbone of many economies and communities. Long-term commitment to funding and effective management can result in significant conservation achievements across a whole country or region. In contrast, when the benefits of protected areas are not understood, support is often weaker. As a result, the ability of protected areas to conserve nature may be reduced by underinvestment and a lack of regulation.

Nearly all countries can accelerate action and investment in protected areas systems, but it will take the same consistent commitment that is made towards other priorities, such as trade, education and economic development. Despite the increase in the number of protected areas around the world, the current annual funding in developing countries has dropped from US\$ 700 million in the early 1990s to around US\$ 400 million in 2004 (Chape, 2005)

Internationally agreed goals and environmental treaties provide the foundation and direction for government action on protected areas. But these commitments will be meaningful only if they can be successfully translated into national action with support from all levels of society.

LINKING PROTECTED AREAS TO THE DEVELOPMENT AGENDA

With over 1.3 billion people depending directly on fisheries, forests and agriculture for employment, the links between protected areas, healthy ecosystems and economic well-being are becoming increasingly clear (WRI, 2005). Yet while poverty reduction is a priority for both governments and donors, only a tiny proportion of investment is being put toward conservation as a means to protect livelihoods and improve incomes. It is only when the social and economic benefits of protected areas are understood that appropriate investment and action follows.

Based on recommendations from the Program of Work on Protected Areas and from the last CBD COPs where Governments, as a matter of urgency, agreed to assess the socio-economic and cultural benefits and costs of protected areas; countries with the support of some organizations, have started to gather evidence that protected areas generate significant contributions to local and national economies and that their economic value for the livelihoods of the poorest and most vulnerable sectors of the society is very high.

MAKING THE CASE FOR PROTECTED AREAS

The Nature Conservancy is working with partners, including governments, communities and local conservation organizations, to understand and communicate the links between human well-being and protected areas. The first stage of this program is assessing the social and economic costs and benefits of protected areas. These findings are then communicated to the public and key stakeholders to inform decisions and build support. The Conservancy is currently supporting government initiatives in countries including Bolivia, Indonesia, Venezuela and Mexico to demonstrate the social and economic benefits of conservation. These campaigns will

help support specific political action on protected areas in each country that recognizes their contribution to poverty reduction and development.

EVIDENCE OF BENEFITS PROVIDED BY PROTECTED AREAS

Preliminary results from the studies show that protected areas can generate important social and economic benefits:

- Tourism activities represent around 8% of Mexico's gross national product, and approximately 5.5 million tourists visited federal protected areas, with direct expenditures close to US\$ 285.7 million
- The value of Mexico's protected areas as carbon sink is estimated at US\$ 12.2 billion
- Around 2.7 million people in Peru use water that originated from 16 protected areas with an estimated value of US\$ 81 million. The rivers in these protected areas also contribute to the generation of 60% of Peru's hydroelectricity, with an estimated value of US\$ 320 million
- 18 national parks in Venezuela supply with fresh water the needs of 19 million people, or 83% of the country's population that inhabit large cities. About 20% of the irrigated lands of the country are dependent on protected areas for receiving irrigation water
- Around 25% of the income from entrance fees to the Eduardo Avaroa Reserve in Bolivia, is allocated every year to social and economic development projects benefiting surrounding communities. At a point in time, these communities received more funding from entrance fees than from any other public sources. Now, the main source of income for a big portion of the population of the area comes from engaging in tourism activities.
- In Weh Island, Sabang, Aceh, Indonesia the park contributed with more than 60% to the regional GDP and the average household income of those who are engaged in tourism activities almost double the income of those who work in other sectors.

23. INVOLVEMENT OF MULTI-STAKEHOLDERS IN NATIONAL PARKS MANAGEMENT OF JAPAN

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Keywords: national park, multi-stakeholders, partnership

NATIONAL PARKS OF JAPAN

In Japan, more than 90 % of the protected areas are designated as Natural Parks based on the Natural Parks Law. Natural Parks are composed of three types: National Park, Quasi-National Park and Prefectural Natural Park. Among them, National Parks cover the largest area, which are designated for the purpose of conserving the outstanding scenery representing Japan's natural beauty.

In the National Parks, the activities that would cause environmentally negative impacts are regulated by the Natural Parks Law, and the management activities for the conservation and proper utilization of the parks are conducted. While the National Park system has been regarded as a tool to protect natural scenic beauty, its vital role in conserving biodiversity is increasingly recognized recently. In the third National Biodiversity Strategy of Japan, which was approved in 2007, National Parks are regarded as the backbone of biodiversity conservation in Japan. In this regard, the top priority is given to the management of National Parks among the protected areas. Currently, the National Parks cover more than 5.5% of the national land area and are visited by more than 3 billion visitors annually.

Adoption of "Zoning system" is one of the key features of the Natural Park system in Japan, reflecting the complexity of land ownership. Each park consists of not only national land, but also public and private land, much of which is often used to support the livelihood of local communities, such as for agriculture and forestry. Also, many local residents are often engaged in tourism in the National Parks and therefore, a sound balance between nature conservation and industries like agriculture and tourism needs to be achieved in a sustainable way. What is more, most of the national land within the National Parks is national forest owned by Forestry Agency, and Ministry of the Environment owns only a very small portion of the national land. Therefore, the partnership among multi-stakeholders including national and local governments, local people and NGOs is crucial in the governance of the National Park system in Japan.

MANAGEMENT SYSTEM OF NATIONAL PARK

In Japan, Ministry of the Environment is in charge of policy planning, designation and management of National Parks. Aside from the staffs in the Nature Conservation Bureau in Tokyo, currently about 260 Park Rangers and 80 auxiliary Rangers are employed for the National Park management and other nature conservation issues, and their number is gradually increasing. The budget of the Ministry for park management is about ten billion yen: less than 1 US dollar for each person of the national population. And about 90% of the budget is used for public work projects like development of park facilities and nature restoration. To complement insufficient budget and manpower, the partnership between multi-stakeholders including local government, landowners, facility builders, and NGOs is essential in the park management.

INVOLVEMENT OF MULTI-STAKEHOLDERS

A number of programs have been implemented by Ministry of the Environment for involvement of multi-stakeholders.

Park Volunteers Program

In order to receive and utilize voluntary help and services in Natural Parks from the interested public, Park Volunteers Program is carried out. The registered Park Volunteers participate in various activities of the park management such as visitor service, interpretation activities, facility maintenance... etc. In addition, Natural Park Advisers are appointed to instruct and inform visitors for the protection and proper use of the parks.

Park Management Organizations

Park Management Organizations are private organizations designated for engagement in various programs of park management. They conduct vegetation restoration, maintenance of park facilities, disseminating information and so on. The designated organizations are given the authority to manage and protect the land on behalf of the landowner.

Employment of local people

For better management of the parks, the Ministry employs local residents, who are knowledgeable about the local nature and social situations to perform various activities including conservation of wildlife, exterminating alien invasive species and cleaning locations of difficult access. In 2007, more than 180 programs were approved and more than 3 billion yen are spent for the program nationwide.

Nature Restoration Projects

To restore nature that had been destroyed in the past, Nature Restoration Projects have been implemented in National and Quasi-National Parks in order to revitalize wetlands, coral reefs, forests and secondary natural environment. Consultation committees are set up to endure the cooperation among various sectors and decide on the goals, objectives and methods of the restoration projects.

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24. TRADITIONAL AND CUSTOMARY USE AND MANAGEMENT IN THAILAND: INDIGENOUS PEOPLES AND THE IMPLEMENTATION OF THE CBD PROGRAMME OF WORK

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Keywords: indigenous peoples; customary use; Article 8(j) and related provisions; collaborative management

INTRODUCTION

The key purpose of this poster is to present traditional and customary uses, management and conservation of natural resources and biological diversity in Thailand by the indigenous peoples of the highlands in and around protected areas the North of the country. The poster also intends to present information about work being done on various aspects of the CBD Programme of Work on Protected Areas, the implementation of Article 8(j) and work towards realizing Article 10(c), seeking to show both the work of the Thai government and work being done by indigenous peoples.

SITES AND TYPES OF PROTECTED AREAS IN THAILAND

Thailand is a country situated in Southeast Asia sharing borders with four countries. To the west Thailand adjoins Burma/Myanmar, to the north Lao PDR and Burma/Myanmar, to the east Lao PDR and Cambodia and to the south Malaysia. The total area of Thailand is 513,115 km² and owing to its position close to the equator it is a tropical country with a correspondingly large diversity of forested areas including deciduous and evergreen forests. From the data collected in forest surveys conducted in 2000, there is a total of 172,050 km² of forests in Thailand, within which a total number of 139 national parks have been declared, a further 55 Wildlife sanctuaries and the classification of upper watershed classes 1a and 1b (the strictest form of conservation) has been applied to 93,090.36 km². These forested areas are the home to high levels of biological diversity, high ecological value and significance and in many cases includes traditional and customary lands of indigenous peoples as customary patterns of use have ensured sustainable use and retained high ecological significance and diversity – despite having used the forest areas for commensurate lengths of time with lowland communities.

CONSERVATION MANAGEMENT AND ITS IMPACTS ON INDIGENOUS PEOPLES IN THAILAND

The total population of Thailand stands at around 63 million people and includes 13 different highland indigenous peoples (total population of approximately 1 million people). Indigenous peoples in Thailand have been living in the area of modern day Thailand for generations, many for over 250 years – equal to the age of establishment of Bangkok. The Thai government declared protected area status over the past 40 years, overlapping in many areas with the areas already inhabited by indigenous peoples. The associated laws that were introduced dealt very strictly with the existing populations of indigenous peoples, including the National Park Law of 2504, Wildlife Protection Law of 2535, the Cabinet Resolution of 2528 declaring classifications of watershed areas, the National Reserve Forest Law of 2507 and the Highland Master Plans for the Development of Communities, the Environment and Control of Narcotic Plants which began in 2535. These laws created many problems for highland communities, in some cases forcing their relocation and in others resulting in detention and arrests of community members, and discriminating against their lifestyles and livelihoods. This situation is in direct contravention of the Convention on Biological Diversity which the Thai government has ratified in front of the international community.

ACTIVITIES AND WORK RELATED TO THE CBD PROGRAMME OF WORK

Activities in Thailand related to the CBD Programme of Work on Protected Areas include the Joint Management of Protected Areas project (JoMPA), a project implemented jointly by the Department of Plants and Wildlife in National Parks and local community organizations, being piloted in 18 areas in Thailand. This project is an impressive and salutary beginning by the Thai government to change the situation in Protected Areas, but it faces many legal difficulties as existing laws are in conflict with the co-management approach. Often staff in the local areas, both officials and field staff, worry about acting against or not in line with existing legal frameworks and this caused the progress achieved today in the JoMPA project, and its future potential, to rest largely with the vision and sincerity of the head of the National Park in each pilot area. In addition to this, the project does not yet have clear guidelines or methods for working in collaboration with the other pilot areas to influence policy level discussions. Villagers are one stakeholder group together with many other diverse groups invited to participate by the government, and they still challenge the government about how sincere the government really is in collaborative management – when the management of the project from the government side is changed regularly and government representation lacks continuity of staff.

RECOMMENDATIONS

1. In line with Goal 2.2 of the CBD PoW, the government must fully respect the individual and collective rights of communities to their territories and to their natural resources, and provide effective protection in the law to their rights to own, use, develop and protect their lands, territories and resources. These protections must be provided with respect for, and compliance with, traditional customary authorities and traditional tenure systems. The government must respect and acknowledge the traditional knowledge, cultures and practices of indigenous peoples, and provide support to the establishment of a sustainable, equitable and appropriate system of management of the environment and natural resources.
2. Also in line with Goal 2.2 of the PoW, the government should promote the participation in resource management and protected areas by indigenous peoples with traditional and customary livelihoods and resource use patterns, and should develop mechanisms to ensure that representatives of indigenous peoples are able to participate in all levels of decision making from the local to policy level.
3. In line with Goal 2.1 and 2.2 of the PoW, the government should collaboratively manage natural resources together with indigenous and local communities in a holistic manner, without separating areas and issues. There should be a concerted effort to conserve and revitalize forested areas in both the highlands and the lowlands equally. A century ago there was forest throughout Thailand – highlands and lowlands – with only approximately 25% of forest lands being used for agriculture but in the present the lowland areas have been denuded of forests entirely, leaving only areas inhabited by indigenous peoples and resulting in the government enacting forest protection laws only in indigenous peoples' lands – a clear violation of the rights of indigenous peoples and a discriminatory act against the very peoples who have protected the forest resources of the nation
4. The government must respect and support the rights of indigenous peoples as enshrined in international conventions, declarations and agreements which the government has ratified such as the Convention on Biological Diversity and the United Nations Declaration on the Rights of Indigenous peoples.
5. As a step to implement Goals 1.1, 2.1, 2.2 and 3.1 of the PoW, the government should review, adapt and rectify the national policies and laws that are not in compliance with commitments under the Convention on Biological Diversity and the 2007 Constitution of the Kingdom of Thailand by opening opportunities for chosen representatives of indigenous peoples to participate in all levels of decision making.
6. Indigenous peoples' organizations should be supported to develop and strengthen their capacities for effective participation in protected areas decision-making and management.

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3

ENABLING ACTIVITIES

25. BOTTOM FISHERIES IN THE HIGH SEAS: MANAGEMENT, BIODIVERSITY AND CONSERVATION

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Keywords: high seas, deep-sea fisheries, vulnerable marine ecosystems, fisheries management, conservation

INTERNATIONAL CONCERN FOR DEEP-SEA HABITATS AND SPECIES

In recent years there has been rapid development of deep-sea fisheries and, in many cases, this development has not been sustainable in relation to the target and non-target species. These fisheries often target marine species with low productivity which can sustain only very low rates of exploitation. Another major concern regarding deep-sea fisheries is the potential impact on vulnerable marine habitats, species and communities caused by the effects of physical contact of the fishing gear with the seabed and associated structures

The management of deep-sea fisheries and the protection of ecosystems in the high seas are problematic because of the current gaps in the international and regional legal frameworks, the difficulties with monitoring, control and surveillance (MCS), and the persistent issue of illegal, unreported and unregulated (IUU) fishing. These issues have been high on the priority list of the international community and have been discussed at fora ranging from the United Nations General Assembly (UNGA) (specifically resolution 61/105 from 2006), the Convention on Biological Diversity Conferences, the DEEP SEA 2003 conference (Queenstown, NZ), to many non-governmental (NGO) conferences such as those held by the World Conservation Union (IUCN). The Food and Agriculture Organization of the United Nations (FAO) is actively involved in issues related to the management of deep-sea fisheries in the high seas and in the conservation of marine resources and habitats, consistent with its 1995 Code of Conduct for Responsible Fisheries, as well as in the protection of vulnerable marine ecosystems (VMEs).

VULNERABLE MARINE ECOSYSTEMS

VMEs (or vulnerable species, habitats and communities) and the potential degradation of such areas have been an issue of high priority at the UNGA 61 where FAO was requested to develop guidance on sustainable fisheries and the avoidance of adverse impacts on VMEs. The Expert Consultation on International Guidelines for the Management of Deep-sea Fisheries in the High Seas (Bangkok, 11 to 14 September 2007) was convened to continue FAO's work on deep-sea fisheries and VMEs.

Criteria for the establishment of VMEs were developed at the Expert Consultation and according to the guidelines, an ecosystem is considered vulnerable if it: contains unique or intrinsically rare species, communities or habitats; contains habitats that support endemic species; supports the presence of depleted, threatened, or endangered species for all or part of their life histories; contains important habitat for populations and for which alternative habitats are not known to exist or are uncommon, whether or not the actual functional relationship between species and habitats are known; is fragile, especially if it contains populations, communities, or habitats that are easily damaged by anthropogenic activities, including fishing, particularly if the features that are damaged have long recovery times or where recovery may not be to the former pre-impact state; is characterized by complex physical structures created by biotic features (e.g., corals, sponges, bryozoans) or by abiotic features (e.g. boulder fields, clay levees); and supports species whose life-history traits make recovery long or unlikely if impacted.

MARINE PROTECTED AREAS IN THE HIGH SEAS

The impact of fishing activities on the biodiversity of the marine environment is one of the main reasons for the creation of marine protected areas (MPAs) in the high seas. MPAs (in particular, areas closed to all or specific fishing activities) are proposed as a useful protective measure within the frameworks of precautionary and ecosystem-based approaches to reduce the impact of fishing on vulnerable marine habitats, species and communities. Owing to the difficulty in management and MCS, as well as the governance gaps there are few fishery-related MPAs in the high seas. However in recent years, the number of MPAs in the high seas has increased as regional fisheries management organizations (RFMOs), which have the mandate to manage such fisheries, have started to implement temporary closed areas with the primary objective of protecting vulnerable marine habitats or species (e.g. NEAFC, NAFO, GFCM, and SEAFO). Industry-led initiatives for the protection of areas not covered by RFMOs have also recently emerged such as the benthic protected areas (BPA) established by the Southern Indian Ocean Deepwater Fishers' Association (SIODFA) (see Table 1 for more information).

If today fishing is considered the major threat is to vulnerable marine habitats, species and communities, tomorrow other threats such as bio-prospecting, mining, energy development and CO₂ sequestration may arise. Implementation of spatial management measures will have to be considered in a broader context, rather than solely that of fisheries. In addition, threats affecting the water column, and not only the seabed or seafloor will have to be considered: pollution, noise, litter, disturbances, etc. will have to be factored into the activities taking place in an area. MPAs, or spatially based management, are one of the few management tools that address the activities of multiple sectors, and therefore might constitute an important tool in the present and future management of the human impacts on deep-sea ecosystems including fisheries in the high seas.

FAO ACTIVITIES

The international community has been actively pursuing work related to defining and identifying VMEs, and creating standards for sustainable fishing in the high seas. The FAO Fisheries and Aquaculture Department is leading the development of International Guidelines for the Management of Deep-sea Fisheries in the High Seas. These guidelines will include guidance on management tools in the high seas, including spatial management measures. In preparation for the guidelines FAO commissioned a background paper on MPAs in the high seas entitled, *High Seas Marine Protected Areas and Deep-sea Fishing* by K. Gjerde (FAO Fisheries Report No. 838). In addition, the FAO Fisheries and Aquaculture Department is seeking to involve and engage industry in developing sustainable solutions to deep-sea fisheries in the high seas. Skipper's meetings will be held in 2008 that will focus on the industry's perspective in regard to the implementation of the guidelines and best practices in deep-sea fisheries in the high seas.

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- The Government of Japan
- The Government of Norway, Ministry of Fisheries
- The Government of Iceland

TABLE 1: Examples of areas closed by RFMOs and other arrangements

EXAMPLES OF CLOSED AREAS IN THE HIGH SEAS THROUGH RFMOS AND OTHER ARRANGEMENTS			
	CLOSED AREAS		WEB SITES
REGIONAL FISHERIES MANAGEMENT ORGANIZATIONS (RFMOS)	North East Atlantic Fisheries Commission (NEAFC)	<ul style="list-style-type: none"> 4 seamounts and a section of the Reykjanes Ridge are closed to bottom trawling and static gears for three years. 	http://www.neafc.org/
	Northwest Atlantic Fisheries Organization (NAFO)	<ul style="list-style-type: none"> 4 seamount areas are closed to bottom trawling for a period of 4 years. 1 Coral Protection Zone closed to all fishing activities involving bottom contact gear. 	http://www.nafo.int/
	South East Atlantic Fisheries Organization (SEAFO)	<ul style="list-style-type: none"> 10 seamount areas closed to fishing activities for species covered by the SEAFO convention for a period of 4 years. 	http://www.seafo.org/
	General Fisheries Commission for the Mediterranean (GFCM)	<ul style="list-style-type: none"> 3 areas closed to dredging and trawling to protect coldwater corals, cold hydrocarbon seeps and seamounts. towed dredges and trawl net fisheries are prohibited at depths greater than 1000 metres. 	http://www.gfcm.org/fi/web-site/GFCMRetrieveAction.do?dom=topic&fid=16083
OTHER ARRANGEMENTS	Southern Indian Ocean Deepwater Fishers' Association (SIODFA)	<ul style="list-style-type: none"> 11 areas closed to bottom trawling by the main deepwater fishing companies operating in the area. 	(for closure announcement) http://www.iucn.org/en/news/archive/2006/07/2_pr_fishing_high_seas.htm

26. IMPLEMENTING THE PROGRAMME OF WORK ON PROTECTED AREAS – INGREDIENTS OF SUCCESS

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Keywords: Implementation, national leadership, coordination, NGO support, success factors

Over the past three years of actively supporting national implementation of the programme of work on protected areas, The Nature Conservancy has identified four key ingredients of success: capacity, commitment, capital and coordination.

CAPACITY

In order to conduct the many assessments called for in the programme of work, governments must have sufficient technical capacity. In partnership with the Secretariat of the Convention on Biological Diversity, a consortium of non-governmental organizations, including The Nature Conservancy, World Wide Fund for Nature, World Conservation Society and Birdlife, has held nine regional workshops over the past 18 months. The workshops, which focused on ecological gap assessments, management effectiveness and capacity assessments, sustainable finance assessments and protected area system master planning, reached 118 countries and over 750 protected area specialists. The consortium has committed to continuing this series through 2010.

However, such workshops are only a beginning in improving governments' technical capacity to implement the programme of work. One step is to improve access to new and existing tools and case studies through web sites and electronic media (please visit www.protectedareatools.org to see some of the latest materials). Another step is to foster in-depth technical clinics and exchanges between protected area specialists, to share approaches and provide one-on-one assistance. The country of Madagascar has offered to host such a clinic for neighboring countries, focusing on integrating freshwater and marine biodiversity into ecological gap assessments, among other technical issues. Another step to raise national capacity is to develop virtual curricula. One example of this is a new curriculum on business planning for protected areas – please visit <http://capps.wsu.edu/SustainableFinance/> for more details.

COMMITMENT

Fully implementing the programme of work requires visionary leadership and bold commitment. One example of such leadership is President Bongo's decision to create 13 new protected areas across Gabon, covering ten thousand square miles, and over ten percent of its national territory. The government's vision is for Gabon's national parks to become a "global model of conservation." Many other countries have taken similar steps to increase the coverage and representativeness of their protected area networks, including Australia, Brazil, Bahamas, Germany and Madagascar, to name just a handful. These countries have committed to ambitious protection goals, and have begun to take bold actions to turn those commitments into action.

A few countries, however, have taken their commitments to an even higher level by catalyzing regional protected area 'challenges' with neighboring countries. In 2005, President Remengesau of Palau declared that his country would seek to protect 30 percent of near shore resources and 20 percent of forest resources by 2020. The following year, the "Micronesian Challenge" was born, where neighboring countries across Micronesia have committed to the same ambitious protection goals. Similar regional challenges, such as those in the Caribbean, the Amazon, the Coral Triangle and the Mediterranean, are becoming increasingly important mechanisms for raising global commitment for fulfilling the programme of work on protected areas.

CAPITAL

Implementing the 92 actions of the programme of work on protected areas requires sufficient financial capital to undertake the many assessments required, including assessments of ecological gaps, management effectiveness, capacity needs, sustainable finance needs, equity and benefit sharing, and policy environment, among others. NGOs and donors have played a key role in financing these assessments. The Nature Conservancy, for example, has invested \$4 million in implementation grants to 25 countries. Based on this model, the GEF has recently developed a US\$ 9 million fund for conducting key assessments of the programme of work (see the website www.protectedareas.org for details on this fund).

However, assessments are only the first step. The real work lies in implementing the assessment results – in improving the protected area network, in improving protected area management, and in improving the broader enabling environment. To fully implement the programme of work, governments will require long-term financial resources, and will likely need to explore a range of innovative financial mechanisms. In Belize, for example, the government created an airport departure tax, a move that created a significant new stream of protected areas revenue. In Grenada, Caribbean cruise ships replenish their water supplies by purchasing water that flows from several forested protected areas, providing a sustainable and reliable source of funding. In Mexico, revenue from tourism within protected areas generates more than US\$ 600 million per year. For more on innovative sustainable finance mechanisms, please visit www.conservationfinance.org.

COORDINATION

Many countries are finding that commitment, capacity, and capital are not enough to ensure full implementation of the programme of work – they still require national coordination to ensure that commitments become reality. Over 30 countries (e.g., Brazil, Mexico, Grenada, China, Madagascar) have created multi-stakeholder working groups to help coordinate implementation of the programme of work. These groups, typically comprised of representatives from government and non-governmental sectors, ensure that actions are well coordinated and staffed.

The Nature Conservancy, in reviewing experience with the 25 coordination working groups that it has directly supported, has identified several lessons. First, participation of multiple sectors – from forestry, land-use planning, energy, tourism, fisheries – is critical to the success and long-term societal acceptance of actions. Second, a single, charismatic leader is one of the hallmarks of an effective coordination working group. Third, as most of the working groups intend to work together for several years, a written charter can help buffer against political changes as administrations come and go. Fourth, integrating the costs of associated activities, such as creating new protected areas or improving management effectiveness, into the national budgeting process is critical. The results of these coordination working groups have been impressive – more than 85% of countries with this type of agreement have completed an ecological gap assessment, management effectiveness assessment and sustainable finance assessment for their protected area systems.

FIGURE 1: Members of a coordination working group discuss the findings of an ecological gap assessment in Grenada



27. FINANCIAL SUSTAINABILITY OF NATIONAL SYSTEMS OF PROTECTED AREAS: FINANCIAL PLANNING

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Keywords: Sustainable finance, financial analysis, screening of financial instruments, business-oriented financial plans, sustainable finance scorecard

Achieving sustainable financing for protected areas is at the heart of achieving the successful conservation of nature and natural resources. It must be addressed from both the supply side (increasing funding) and the demand side (increasing capacity to manage financial resources). Sound financial planning is indispensable to address both aspects.

Sustainable financial planning in relation to systems of protected areas and individual protected areas is a working framework or a roadmap. It includes interactive processes involving numerous stakeholders. Ideally, it is a framework that creates a broadly ownership across constituencies, systematizes actions, attracts sufficient resources to fund the protected area system in a more stable long-term manner. The roadmap may include different inclusive processes such as (a) financial analysis (assessing financial needs, income, expenses and definition of financial gaps), (b) selection and feasibility assessment of financial strategies (mechanisms) to address financial needs and gaps, (c) formulation and implementation of financial strategies through a coherent financial plan supported by defined business approaches (business plan). Financial planning may also include the assessment of the legal and institutional framework to enable the establishment of diverse financial mechanisms. The roadmap is useful to determine the course of action, align stakeholder support, establish a cost-efficient process, and it facilitates progress toward goals in a transparent and accountable manner.

- The financial analysis lays the foundations for your financial plan and identifies metrics to measure progress. It serves many purposes, for instance:
- Clarifies your PA management goals and determines the cost of achieving your PA management goals.
- Defines key metrics for mission critical and optimal states and calculates the resources required to meet critical and optimal states.
- Defines the gap between currently and required resources
- May justify additional funding or investments and defines priorities to allocate resources

The financial gap is determined by comparing income and needs. We consider two different types of gaps: “mission critical” minimum level of activities to sustain all functions of the ecosystem and “optimal” resources needed to achieve the best conservation scenario.

The financial mechanisms are the heart of a financial strategy. They generate revenue to cover the cost of management and conservation activities. Therefore a critical aspect of financial planning is the screening and selection of financial mechanisms. This process includes methods such as simple analysis of complexity vs. impact, and for more complex financial instruments a detailed feasibility assessment. This assessment focuses on identifying two or more operative models to implement a financial mechanism. Based on this analysis, the best operational model can be selected. The feasibility analysis also determines when a financial mechanism is not feasible and therefore should be dropped. The feasibility assessment may include social and environmental elements in order to better determine operative models. The screening of financial options determines whether the investment of time, effort and expense to establish financial mechanism is worthwhile; and this process is critical to establish a diversified portfolio of income sources.

Diversification is critical to fill financial gaps, optimize financial risk management, reduce dependency on international and government funding, address government's capacity to generate and retain income and promote fiscal reform. A diversified portfolio includes marked and non-marked based financial instruments. For example, tourism fees and taxes, payments for environmental services, user/polluter-payments, earmarked revenues not related to environment, earmarks from activities outside protected areas, and government allocations and trust funds.

The financial plan is a strategic document that includes the financial background of the protected areas. It summarizes protected area income, needs and financial gaps and the implementation plan for the diverse strategies that will be used to address needs and fill financial gaps. It may also include different strategies to address legal and institutional reform to enable the implementation of the plan, as well as, related capacity building aspects. It is recommended that the financial plan includes business plan (s) to support the implementation of marked-based financial mechanisms. A business plan can be defined as a financial management tool integrated to the financial plan. It is used to ensure that the full economic potential of the chosen financial mechanisms is achieved, and to strengthen PA financial management capacity. The business plan defines all the implementation aspects of the operative model of a financial mechanism, and commonly focuses on a single best operating model. A financial plan may include different business strategies (plans) for different financial mechanisms. A business-oriented financial is essential to:

- promote behavioral change to embrace business opportunities,
- align decision-making with financial opportunities and PA objectives,
- anticipate financial shortfalls and identify solutions; and,
- demonstrate the public, government decision-makers, donors and the private sector that PA manager as a business professional with clear goals.

Finally, it is also indispensable to measure progress. Using the financial sustainability scorecard you can measure progress towards sustainable financing. The scorecard is designed to assist governments, donors and NGOs to assess progress in the different aspects of a PA system financing: accounts and underlying structural foundations, and includes: (a) financial data to determine the costs, revenues and financial gaps, (b) governance frameworks that enables sustainable financing, (c) use of tools such as business planning and other tools for cost-efficient management and revenue generation.

28. THE ROLE OF THE FOOD AND AGRICULTURE ORGANIZATION (FAO) OF THE UNITED NATIONS IN SUPPORTING TERRESTRIAL AND MARINE PROTECTED AREAS

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Keywords: wildlife management; fisheries management; monitoring and assessment; partnerships

A KNOWLEDGE-MANAGEMENT ORGANIZATION

As a knowledge-management organization, FAO of the UN supports the identification, management, monitoring and assessment of terrestrial and marine Protected Areas (PAs) through initiatives and partnerships aimed at the conservation and sustainable use of natural resources for food security and poverty alleviation. Actions related to the establishment and management of PAs are conducted from the local to the global level by addressing, for instance, human-wildlife conflicts, indigenous people and livelihood issues, environmental change, illegal trade, and (inter)national policies (see Table 1. Relevant Websites).

FAO AND TERRESTRIAL PROTECTED AREAS

The role of FAO in the identification, monitoring and assessment of the terrestrial PAs focuses on geo-referenced information and scientific data/information related to the trends and extent of terrestrial ecosystems and their land cover/use. In particular, FAO facilitates the accessibility of geo-referenced data and its harmonization and standardization, for example, through:

- GeoNetwork allowing for the retrieval of geo-referenced data and related metadata through different search-categories.
- FAO/UNEP Global Land Cover Network (GLCN) and its Land Cover Classification System (LCCS) enabling harmonization and standardization of land cover data.
- Global Terrestrial Observing System (GTOS) and its Terrestrial Ecosystem Monitoring Sites (TEMS) database facilitating access to terrestrial observations.

These and other initiatives provide countries with the necessary scientific *in situ* and remote sensing information of impacts of environmental change, the interface with agricultural lands and agricultural suitability, zoning and overall changes in land cover/use. In this context, it is also important to highlight FAO work on the assessment and monitoring of status and trends in the extent of forested PAs and/or areas designated for conservation of biodiversity, as shown in the Global Forest Resources Assessments (FRA) 2005 data on “area of forest designated for conservation of biodiversity”, which complemented the data on forested PAs gathered, analysed and presented in FRA 1990 and FRA 2000. As part of the next global assessment (FRA 2010) data will be collected from countries on the area of forest in PAs and an updated map of forests in PAs will be prepared in collaboration with UNEP-WCMC and South Dakota State University, USA.

FAO also assists countries in the establishment and management of PAs through supporting specific *in situ* actions and enabling neutral fora. For example, FAO assisted Mozambique in developing a proposal for a national strategy for human-wildlife conflict management and a study on the advantages/disadvantages of a parastatal body to manage wildlife and PAs and in West Africa (Ghana, Guinea, Liberia) FAO supported surveys on bushmeat trade and consumption. In this context, FAO has elaborated manuals on human-wildlife conflict management (e.g. on lions, elephants) in order to address agricultural losses stemming from human-wildlife

conflicts, from the perspective of agricultural production. In these matters, the FAO African Forestry and Wildlife Commission through its subsidiary body *Working Party on Wildlife and Protected Areas (WPWA)* provides a unique neutral forum for many different stakeholders (e.g. governments, research institutes, civil society) to discuss subjects on the interface of agricultural production and wildlife management, draw recommendations for national policy/legislation and FAO processes, promote research and policy analysis on wildlife issues, enable synergies with other related institutions and builds consensus on priority African wildlife concerns within (sub-)regional and international negotiations. Actions are also undertaken to assist community forestry and the sustainable harvest and commercialisation of Non-Wood Forest Products, providing alternative livelihoods for forest-dependent communities.

In February 2007 an e-forum was organised on “*Pueblos Indígenas y Áreas Protegidas en América Latina*” by the Latin American and Caribbean Forestry Commission through the *Red Latinoamericana de Cooperación Técnica en Parques Nacionales, otras Áreas Protegidas, Flora y Fauna Silvestres (REDPARQUES)*. FAO co-organized the 2nd Latin American Congress of National Parks and other Protected Areas (San Carlos de Bariloche, Argentina, September-October 2007) – attended by more than 2,000 local, national and regional participants, which concluded with the Bariloche Declaration. The Regional Office for Africa, as well as the Regional Office for Asia and the Pacific, produces regional publications, such as *Nature & Faune* and *Tiger Paper*, dedicated to the exchange of information relating to wildlife and national park management.

FAO AND MARINE PROTECTED AREAS (MPAS)

A recent workshop, *Marine Protected Areas and Fisheries Management: A review of issues and considerations* (Rome, Italy, June 2006), was organized by FAO following recommendations made by the 26th Session of the FAO Committee on Fisheries (COFI). The workshop, attended by experts from a wide variety of disciplines, provided the opportunity to review and characterize MPAs as fisheries management tool and to work towards the preparation of the Technical Guidelines for MPAs as a Fishery Management Tool. Based on the result of the work completed at the workshop, the drafting of technical guidelines for the implementation, review and testing of MPAs in a fisheries management context has commenced. In addition, the important role of MPAs in biodiversity conservation and fisheries management was reaffirmed by COFI at its 27th session (Rome, Italy, March 2007) and FAO was encouraged to complete its technical guidelines on MPAs. The guidelines join fisheries management and conservation concerns as well as establishing a focus on a more holistic program of large-scale marine planning for optimal effectiveness and impact. To complement the development of the guidelines case studies will be conducted to analyze the implementation and success of MPAs established with fisheries management goals in diverse regions of the world.

In October 2007, a new FAO MPA Website was launched as part of the programme implemented by FAO for a better understanding of the contribution of MPAs to fisheries management, and the identification and promotion of best practices and integrated approaches to MPAs. A set of current issues regarding the use of MPAs as a tool for fisheries management is introduced, including links to external internet resources of interest. A specific section presents the guidelines being prepared by FAO, on the design, implementation and testing of MPAs.

PARTNERSHIPS AND INNOVATIVE IDEAS

FAO works in partnership with many institutions on PA-related issues such as the World Conservation Union (IUCN) on MPA-related activities and with the UNESCO World Heritage Center on the Central African World Heritage Forest Initiative (CAWHFI) covering 3 transboundary landscapes of the Congo Basin articulated around key PAs. In addition, within the framework of its work on agricultural biodiversity, FAO continues to explore dynamic conservation and sustainable management of outstanding traditional agricultural systems (e.g. outstanding rice based systems, maize and root crop based agro-ecosystems) through “Conservation and Adaptive Management Globally Important Agricultural Heritage Systems” (GIAHS).

TABLE 1: Relevant Websites

	INITIATIVES	WEBSITE
TERRESTRIAL AND MARINE PROTECTED AREAS (PAS)	E-forum Pueblos Indígenas y Áreas Protegidas en América Latina	www.rlc.fao.org/foro/pueblos/
	FAO MPA Website	www.fao.org/fi/website/FIRetrieveAction.do?dom=org&xml=mpas.xml
	GeoNetwork	www.fao.org/geonetwork
	Global Forest Resources Assessment (FRA)	www.fao.org/forestry/fra
	Global Land Cover Network (GLCN) and Land Cover Classification System (LCCS)	www.glc.n.org
	Global Terrestrial Observing System (GTOS) and TEMS Database	www.fao.org/gtos & www.fao.org/gtos/tems
	Latin American Congress of National Parks and other Protected Areas	www.congresolatinoparques2007.org/
	Nature & Faune (Africa)	www.fao.org/world/regional/raf/workprog/forestry/magazine_en.htm
	Red Latinoamericana de Cooperación Técnica en Parques Nacionales, otras Áreas Protegidas, Flora y Fauna Silvestres (REDPARQUES)	www.rlc.fao.org/redes/parques/
	Tiger Paper (Asia and the Pacific)	www.fao.org/world/regional/rap/tigerpaper/tigerpaper.htm
PARTNERSHIPS AND INNOVATIVE IDEAS	Central African World Heritage Forest Initiative (CAWHFI)	http://whc.unesco.org/en/cawhfi
	Globally Important Agricultural Heritage Systems" (GIAHS)	www.fao.org/sd/giahs

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- The Government of Japan
- The United Nations Foundation
- The Government of Norway

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STANDARDS, ASSESSMENT, AND MONITORING

29. NATURE CONSERVATION INFORMATION SYSTEM OF HUNGARY

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Keywords: Nature Conservation Information System, TIR, conservation, GIS, public awareness

The Nature Conservation Information System (NCIS) of Hungary is the embodiment of a new approach in nature conservation activities. The main drive of the development is the INSPIRE directive of the European Union, which came into effect in 2007, defining the principles of geographic data distribution and management in the EU member states.

The result of the NCIS development is a complex, nation-wide geodatabase, which is managed by a software specifically designed for the professional requirements of the conservation authorities and organizations. The system is accessible by “green authorities”, national park directorates, the Ministry for Environment and Water. The database is distributed among the directorates with several predefined replication procedures ensuring constant availability and currentness of data. The software consists of 7+1 modules, each with its predefined set of user groups, functionality and the related right specifications. The modules are the following:

- **Biotics**

This module deals with living organisms inside the various conservation areas (animal and plant associations) for vegetation or ecologic mapping, management planning, species distribution mapping, etc.).

- **Conservation values**

The module stores and manages the basic data related to various conservation areas in Hungary (national parks, landscape protection areas, local protection zone, natural monument, etc.).

- **Forestry**

The module connects data from the National Forestry Service to the forest-related conservation activities. This includes technical operation plans, tree-species distribution, other (valuable) plants or animals, etc.

- **Property management**

This is where information related to land records is connected to conservation data. The module contains administrative boundaries, national reference systems and the land records inside any kind of conservation areas. The continuous updates are inevitable to ensure compatibility to the official land record system.

- **Asset management**

This module focuses on various assets used, owned or leased by national parks and the ministry. This includes the contracts, lessees, parcels, animals, buildings and other structures, agricultural subsidies, etc.

- **Land-use management, event management**

The main objective is to create management plans for conservation areas based on the information derived from all the other modules. It also manages unexpected natural or other phenomena (storms, fires, etc.), contract proposals.

- **Decision support**

This module helps to formulate long term strategies and to plan projects that are in line with the requirements posed by conservation activities. The module generates reports, graphs, aggregated maps that are easily readable by decision makers and the general public as well.

- **+1: Public relations**

Finally the smallest but perhaps most visible module supplies the general public with information about all kinds of conservation activities, including eco-tourism possibilities, national park programs

and the interactive map derived from the NCIS core database of conservation areas. It also provides site descriptions and links to other sources of information (timetables, weather, etc.).

The main objective of the system is to ensure better decisions based on more thorough, objective evaluation using accurate, current and verified data from several sources. The database integrates data and results from outside researchers, universities and other sources, all verified by internal experts before imported into the database, enabling the highest possible validity. Information in the database is made up of various formats: geographic data, photographs, reports, tables and (last but not least) metadata to enable efficient search and query operations.

30. A GLOBAL NETWORK OF PROTECTED AREAS: ON TARGET FOR 2010 AND 2012?

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Keywords: CBD targets, protected areas, global coverage, gap analysis

Measuring progress toward implementation of a global network of protected areas is necessary to gauge our current actions and influence future efforts. In this poster we provide an overview of the policies that have driven this international process as well as monitoring efforts that are used to indicate progress. In the end, this project aims to demonstrate the current degree of protected area coverage and representation regarding global marine and terrestrial targets while offering a frame of reference for identifying gaps and next steps.

CONSENSUS TO DEVELOP A GLOBAL NETWORK OF PROTECTED AREAS:

Until the World Parks Congress of 2003, global conservation targets were focused on declaring 10% of each country as protected areas. In the lead up to the Parks Congress it was realised that this target was close to being met, but that the global protected area network did not adequately cover the distribution of biodiversity as parks had often been declared without a systematic analysis of the distribution of national biodiversity. Various 'gap' analyses on habitats and species distributions were performed and were presented at the 2003 World Parks Congress. These analyses showed that the network of protected areas left a proportion of the world's habitats and species 'unprotected' and after due consideration, various conference recommendations were made that urged nations to look again at their protected area networks and to try and fill these protected area gaps.

Building from the work undertaken at the Parks Congress, the 2004 VIIth Conference of Parties (COP) agreed to a Programme of Work on Protected Areas (PoWPA) with the objective of supporting the establishment and maintenance by 2010 for terrestrial and by 2012 for marine areas of comprehensive, effectively managed, and ecologically representative national and regional protected areas. (CBD COP VII, Decision 7.28: Goal 1.1.). Signatory countries have agreed that at least 10% of the world's ecological regions should be effectively conserved (CBD COP VII, Decision 7.30, Goal 1, Target 1.1).

Progress towards achieving this objective and its targets needs periodic monitoring and reporting to relevant international meetings. This poster presents data on how well the world has been doing at achieving these protected area targets in the marine and terrestrial realms over the past decade, and also outlines whether the existing protected area network is representative of current patterns of biodiversity – using the protected area coverage of Marine and Terrestrial Ecoregions of the world (WWF and TNC) within their constituent biomes – with the analysis presented on a country by country basis

MONITORING THE GLOBAL PROTECTED AREAS NETWORK

In order to monitor the world's protected areas network and progress towards the 2010 and 2012 targets, the CBD has urged the conference of parties to "*Improve and update national and regional databases on protected areas and consolidate the World Database on Protected Areas as key support mechanisms in the assessment and monitoring of protected area status and trends*" (PoWPA, Goal 4.3, Activity 4.3.3). The World Database on Protected Areas (WDPA), a joint project between the United Nations Environmental Programme World Conservation Monitoring Centre (UNEP-WCMC) and the IUCN World Commission on Protected Areas, provides the most comprehensive dataset on protected areas worldwide. It is being constantly updated with information received from and verified by governments and NGOs, stores both location data and polygon

data describing the size and shape of protected areas, and includes information on many other protected area attributes.

METHODOLOGY: MEASURING COVERAGE AND REPRESENTATIVENESS OF THE GLOBAL PROTECTED AREAS NETWORK

Three relevant targets of the Programme of Work on Protected Areas that we plan to analyze include a) the extent of Terrestrial PA coverage, b) the extent of Marine PA coverage, and c) the Ecological Representativeness (habitats/ecoregions/species) of those areas. The degree to which the network is well managed is also important and covered more specifically in another project at UNEP-WCMC.

Spatial coverage of terrestrial and marine reserves

The coverage of protected areas by land and sea area will be calculated globally, regionally and nationally using the spatial data on protected areas held in the WDPA and a gap analysis approach. This will provide a useful indication of which countries and regions are represented well by the current network and which require further protected areas development.

Representativeness of terrestrial and marine protected areas

As well as coverage, the protected areas network must represent the world's ecological diversity. The World Wildlife Fund (WWF) Terrestrial Ecoregions of the World dataset divides the world into 825 global scale ecoregions; large areas of relatively uniform climate that harbour a characteristic set of species and ecological communities. The Marine Ecoregions of the World (MEOW) is similarly used in analysis of MPA coverage by ecoregion. Using these datasets, protected area coverage will be calculated for each ecoregion, indicating which ecological regions are well represented by the protected areas network, and which are in need of further protection. Analyses will also be broken down by IUCN protected areas management category that, among other criteria, provides an indication of the extent to which sustainable extraction is allowed within a protected area. Methods for this analysis will follow the guidelines set by the United Nations Commission on Sustainable Development (UN-CSD, 2007).

The WWF ecoregions provide information on global and regional scale ecological regions, but they are of too coarse a scale to be used at the national level. The UN-CSD and the CBD have encouraged national agencies to develop their own terrestrial biogeographic classification system, but currently detailed national ecological classifications exist for few countries. These analyses will therefore report land area coverage for each country, but cannot measure the extent to which a country's biological diversity is represented by its national protected areas network. The development of national ecological datasets, and the continued updating of the WDPA, will be important for the development of a representative global protected areas network. Further, future analyses at a finer scale will provide additional insights into national goals and ultimately help with setting or revising national conservation targets.

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WWF Terrestrial Ecoregions of the World: <http://www.worldwildlife.org/science/ecoregions.cfm>
WWF Marine Ecoregions of the World: <http://www.worldwildlife.org/MEOW>

31. MAPPING THE WORLD'S PROTECTED AREAS: THE ROLE OF THE WDPA

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WHAT IS THE WORLD DATABASE ON PROTECTED AREAS (WDPA)?

The WDPA is the largest assembly of data on the world's terrestrial and marine protected areas. A joint project of The World Conservation Union (IUCN) and UNEP-WCMC, the database holds spatial and attribute information from governments and NGOs on over 120,000 national and international protected area sites. Increasingly, the WDPA also holds information on private, community and co-managed reserves. For over 25 years the database has been updated and used for conservation. The vision for the WDPA is: *"To create a decentralised, user-friendly, up-to-date system for storing, managing, and reporting on trends in coverage for all the world's protected areas – conforming to best practice techniques and providing a platform that allows for the easy integration of other conservation datasets and user opinion"*(UNEP-WCMC, 2007).

HOW IS THE WDPA USED?

The WDPA has a broad range of use. Scientists, NGO staff and partners, academics, government agencies, and private sector businesses have traditionally used the database for some of the following activities:

Mandates: Every few years (nominally 4) the United Nations (UN) List of Protected Areas is derived from the WDPA. The UN List is the definitive list of the world's national parks and reserves. It is compiled under the authority of the UN, based on resolutions adopted by the UN Economic and Social Council. In addition, the WDPA is used by UNEP-WCMC to support and track world and regional progress towards a number of international targets, mandates, and assessments. The WDPA has recently been used to assess the World's progress towards the 2010 and 2012 targets set by the Convention on Biological Diversity (CBD), and plays an important role within the CBD Programme of Work on Protected Area, which recognizes the importance of the WDPA as a tool for monitoring and assessment (Goal 4.3).

Annual release of data: Since 2003, the WDPA has been released annually in a version that includes a broader range of data on protected areas than the UN list, including private and community reserves. A consortium of NGOs has helped with this effort through contributions of data and knowledge from staff and partners.

Gap analysis of protected areas: Many countries and regions are undertaking gap analyses to identify the extent of protection for biomes, habitats, and species, which assists with prioritization of establishment of protected areas.

Risk assessment and Environmental Impact Assessment: Various industries use WDPA data to plan their activities away from important conservation areas in order to achieve a balance between development and conservation. The database is also used for International emergency response action planning (e.g. oil spills).

WHAT INFORMATION IS AVAILABLE FROM THE WDPA?

Spatial data on both location and boundary (polygon data) is currently held for over 72,000 sites in the WDPA, with location (point data) data available for over 124,000 sites, or 92% of the total sites within the WDPA. In

addition to this spatial data, the WDPA also holds 'attribute data', describing the characteristics of each site, including:

1. Site name (official and local)
2. Country
3. Designation (the type of site, e. g. national park, nature reserve)
4. Status (designated or proposed)
5. IUCN protected area management category (I – VI)
6. Establishment date
7. Location (latitude/longitude)
8. Total area (hectares)
9. Governance (who manages the site)
10. Ownership (who owns the site)

HOW IS DATA ADDED TO THE WDPA?

Data is currently provided from a variety of contributors in a range of formats as the information is generated or becomes available. Our team coordinates this incoming data and actively solicits data through contacts in the government and NGO sectors, paying special attention to specific regions or countries where significant gaps have been found. Only data from government sources is used to compile the UN list. Generally, the database manager works with the contributor and a team of conservation experts around the world to verify the accuracy of the details, and recently UNEP-WCMC has been building relationships with regional partners, such as the European Environment Agency and the Inter American Biodiversity Information Network, so that data can be updated even more rapidly.

HOW IS THE WDPA BEING IMPROVED?

Managing one central database for more than 120,000 protected area sites that exist around the world is not without challenges. Following an increase in the range of organizations that use the database, it has become apparent that some changes are needed to meet the demands, and to streamline the management of large amounts of very important information. Old technology has made data integration time consuming and challenging, and slowed down data flow due to the multiple formats that need to be integrated. Also, certain attributes, such as governance and management zones, are not present for many protected areas in the existing database.

For these reasons, the WDPA is currently being redeveloped. The redevelopment will provide a more diverse and robust range of knowledge and tools to the conservation community. It will be web-based, allowing online registered users from around the world the ability to view, edit and add data through user-friendly, simple tools as well as being able to view and compare other countries' protected areas data. The redeveloped database will be able to store a wider range of protected areas to cover not just nationally or internationally designated sites but community reserves, private reserves, and forest reserves among others. The database will store expanded history details of a site as well as different management types, and will allow for the incorporation of multiple designations within one site, such as no-take and buffer zones, and sites that have terrestrial and marine components.

In addition, as part of the WDPA redevelopment the Marine Protected Areas (MPA) Global dataset (the most comprehensive database on MPAs) is being fully integrated into the WDPA, and therefore will be moving from its current site at <http://www.mpaglobal.org> where it is hosted by the UBC Fisheries Centre, to be managed and accessed through the WDPA at UNEP-WCMC.

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The 2006 version of the WDPA can be freely downloaded at www.unep-wcmc.org/wdpa for non-commercial use.

32. INTEGRATED BIODIVERSITY MONITORING OF PROTECTED AREAS: THE BRAZILIAN PPBIO PROGRAM

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Keywords: biodiversity, monitoring, ecosystem, climate, change

Biodiversity monitoring in protected areas is undertaken for many reasons. In some cases there are specific questions that relate only to the reserve in question, such as the status of an endangered endemic species. However, in most cases, monitoring can produce information that is also important on regional or global scales, such as regional trends in populations, species coverage of reserve networks, contributions of reserves to the dynamics of species exploited outside reserves, the effects of climate change, and as control sites to evaluate impacts that are concentrated outside reserves. Monitoring is much more cost effective if all of these demands are considered simultaneously, and integrated monitoring of biodiversity and ecosystem processes is undertaken.

For most management objectives, monitoring systems should have the following characteristics:

1) Be standardized; 2) Permit integrated surveys of all taxa 3) Be large enough for monitoring all elements of biodiversity and ecosystem processes; 4) Be modular to permit sampling of small areas and comparisons with small samples taken over very large areas; 5) Be compatible with existing initiatives; 6) Be implementable with the existing manpower; 7) Make data available quickly and in a usable form to managers and other stakeholders. Explanations for the need for these characteristics can be found in <http://ppbio.inpa.gov.br>.

THE BRAZILIAN PPBIO PROGRAM

The Brazilian Ministry of Science and Technology *Programa de Pesquisa em Biodiversidade* (PPBio) has promoted the RAPELD system (Magnusson et al. 2005) for long-term monitoring of biodiversity, and the system has been adopted by the *Áreas Protegidas da Amazônia* (ARPA) program, the *Potenciais Impactos Ambientais no transporte de Petróleo e Derivados na Zona Costeira Amazônica* (PIATAM) project, *Centro de Pesquisa do Pantanal* (CPP), and many other organizations, including PPBio-Australasia (<http://www.griffith.edu.au/centre/cics/ppbio/home.html>), for field biological monitoring. Obviously, a single system cannot resolve all monitoring questions. However, an efficient standardized system that can return answers for most questions liberates funds for the more specific local problems.

The range of stakeholders, biological taxa, and ecosystem processes that can be involved in the system has proven to be very large. Publications based on the first RAPELD site have covered taxa and ecosystem processes as diverse as seasonality in leaf-litter fungi (Braga-Neto et al. in press), ecology of fish (Mendonça et al. 2005), habitat specificity of frogs (Menin et al. 2007), beta diversity in understory plants (Costa et al. 2005), and estimates of carbon storage in arboreal biomass (Castilho et al. 2006).

LONG-TERM ECOLOGICAL RESEARCH COMBINED WITH RAPID ASSESSMENT

Many ecological processes, such as population regulation, hydrology, and carbon storage, can only be understood through intensive long-term studies of limited areas. This is the philosophy behind the International Long-Term Ecological Research (ILTER) network. The 25 km² standard RAPELD grids are primarily used for these types of study, and have been installed in Caxiuanã National Forest, Viruá and Jaú National Parks, Uatumã Biological Reserve, Maracá Ecological Station, and the Adolpho Ducke Forest Reserve.

Other complete grids, such as one installed in the Brazilian Pantanal on working cattle ranches, and one planned for a landscape dominated by eucalypt plantations in the state of São Paulo, will use grids in protected areas as controls. Descriptions of these sites can be found in the PPBio website (<http://ppbio.inpa.gov.br>).

Monitoring of protected areas should not only be concentrated within a few areas, but must be distributed throughout each reserve. For this, smaller modules are necessary that can be distributed over larger areas, and that can be surveyed quickly for some groups and ecosystem processes. However, interpretation of data from these more limited survey units can only be done effectively if they are standardized, and use modules that are equivalent to sub-samples of the Long-Term Ecological Research sites. These smaller modules of trails and plots should be permanent, so that monitoring can be carried out over the whole area without having to invest in new survey infrastructure every time. The survey modules should also be appropriate for obtaining data that can be used for extrapolations based on remote sensing.

The RAPELD system has smaller modules that can be used for surveying larger areas, and these have been used in surveys of fish in areas impacted by oil exploration and urban pollution, monitoring of protected areas along federal highways, and areas to be monitored that will be impacted by a hydroelectric dam. The objective of the RAPELD system is to allow integrated monitoring of protected areas, buffer areas, production areas, urbanized areas and areas that will be impacted in the future. It is only when monitoring of protected areas can be integrated with monitoring of other land uses that it will be possible to make effective decisions about integrated land management in the context of a changing world.

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33. MANAGEMENT EFFECTIVENESS EVALUATION (MEE) OF PROTECTED AREAS NETWORK IN INDIA: RECENT EXPERIENCES

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Keywords: management effectiveness evaluation, protected areas, biological diversity, indicators

INTRODUCTION

India has established an impressive network of protected areas (PAs) comprising 98 national parks, 512 wildlife sanctuaries, 41 conservation reserves and 4 community reserves covering 4.8% of the geographic area of the country. However, many PAs are being subjected to threats from illegal resource extraction, poaching, encroachment, tourism and haphazard infrastructure development. There is an urgent need to monitor the trends in biological diversity and other values within and outside the PAs and also to understand the constraints and opportunities in PA management. The Management Effectiveness Evaluation (MEE) is a useful tool that provides fresh insights and understanding of protected area management. A framework for MEE (**Figure 1**) has been developed (Hockings *et al* 2000), which provides overall guidance in the development of assessment systems and provides useful linkages that enable managers to learn from experience. It also helps governments, funding agencies and civil society to monitor the effectiveness of protected areas (Gilligan *et al*, 2005). MEE also helps to assess the capability and success in achieving the intended objectives, outputs and outcomes such as the Convention on Biological Diversity (CBD) target of significantly reducing the loss of biodiversity by 2010 as well as those of CBD Programme of Work on Protected Areas (PoWPA).

INDIA'S INITIATIVES

Recognizing the need for incorporating MEE in the general planning and monitoring of the PA network in India, the Government of India initiated the application of the MEE process in 2003. The first application (2003-07) is a part of the UNESCO-IUCN project '*Enhancing Our Heritage (EoH): Managing and Monitoring for Success in World Natural Heritage Sites*' currently operational in 9 World Heritage Sites in Africa, Latin America and South Asia. The 3 South Asian sites are Keoladeo National Park, Rajasthan, India; Kaziranga National Park, Assam, India and Chitwan National Park, Nepal. The second application (2004-06) of the MEE process was on the network of tiger reserves in India (Anon. 2006). The third application (2006-ongoing) is on the network of national parks and wildlife sanctuaries in India. In all these evaluations the IUCN-World Commission on Protected Areas (WCPA) framework (**Figure 1**) of MEE has been used with appropriate adaptations.

MEE of World Heritage Sites

Under the UNESCO-IUCN '*Enhancing Our Heritage (EoH)*' project, 3 World Heritage Sites in South Asia were subjected to the MEE process using specially designed toolkits. An '*Initial Management Effectiveness Evaluation*' was carried out in 2003, and gaps in management processes were identified. Management interventions to enhance capacity and reduce gaps were implemented from 2003 to 2006 and a '*Final Management Effectiveness Evaluation*' was carried out in 2007 using revised and upgraded toolkits. The initial and final MEE reports are available on the project website http://www.enhancingheritage.net/docs_public.asp. The MEE process has demonstrated the immense utility of conducting such evaluations for PA management as

well as for a range of stakeholders. The project workbook and worksheets provide very valuable guidance for assessment and reporting processes.

MEE of Tiger Reserves

All 28 tiger reserves in India were included in the MEE, which was conducted by a set of 8 independent experts using 4 of the 6 elements of the IUCN-WCPA framework *viz.* Planning, Inputs, Process and Outputs. A set of 45 indicators was used, and the results were peer-reviewed by IUCN experts (Anon. 2005). The MEE process rated 10 tiger reserves as Very Good, 10 as Good, 6 as Satisfactory and 2 as Poor. All 28 tiger reserves can be grouped into 3 clusters (**Figure 2**).

MEE of National Parks and Wildlife Sanctuaries

In response to a directive from the Prime Minister of India's Office (PMO) to conduct an independent audit of all national parks and wildlife sanctuaries in India, the Ministry of Environment and Forests, Government of India, with technical support from the Wildlife Institute of India, initiated the MEE process in 2006. The evaluation is being carried out at 3 levels *viz.* National, State and Site by 5 independent expert teams on a regional basis. All 6 elements of the IUCN-WCPA MEE framework are being used, and a series of specific questions for each element of the framework has been developed. To date, 30 PAs in 24 States have been evaluated (**Figure 3**), and the results indicate that a majority of them are performing satisfactorily. The ongoing MEE of the remaining PAs will enable India to achieve the CBD-PoWPA target.

CONCLUSIONS

India's initiative of evaluating the management effectiveness of its tiger reserves, World Heritage Sites, national parks and wildlife sanctuaries has provided better insights and understanding of the strengths, weaknesses, opportunities and threats (SWOT) of the PA network. It has also led to methodological advancements. Undoubtedly, the evaluation of 3 World Heritage Sites under the EoH project using the specially designed and developed workbook and worksheets has resulted in a very comprehensive assessment as well as reporting on these PAs. Similar assessments would also be useful for specially designated areas, such as tiger reserves and biosphere reserves. The questionnaire-based approach adopted for national parks and wildlife sanctuaries provides a rapid and effective means of monitoring a large number of PAs. This exercise needs to be carried out periodically to monitor the status and trends in PA management. However, there is an urgent need to develop and incorporate appropriate 'social indicators' in the MEE process in order to address the wide array of human dimension issues in PA management.

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FIGURE 1: IUCN-WCPA framework for Management Effectiveness Evaluation

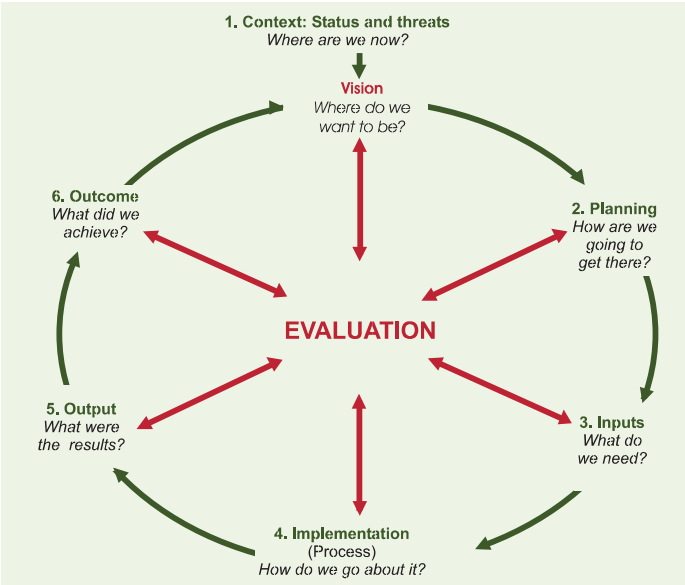
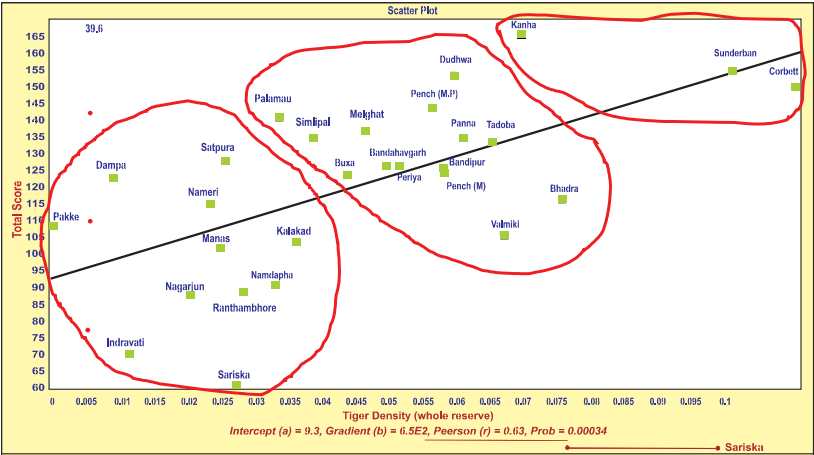
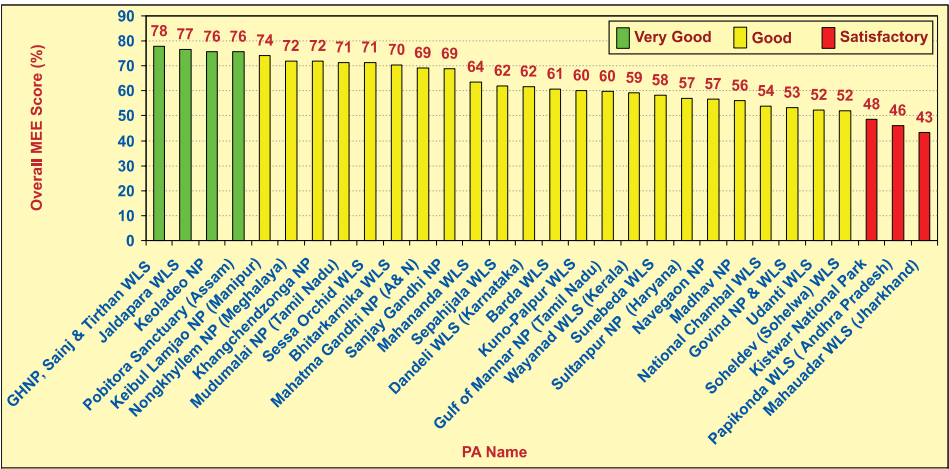


FIGURE 2: Scatter Plot: Management Effectiveness Score V/s Tiger Density



Source: Anon, 2005

FIGURE 3: MEE results of National Parks and Wildlife Sanctuaries



34. ASSESSING THE EFFECTIVENESS OF PROTECTED AREAS MANAGEMENT

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Keywords: protected areas, management effectiveness, global study, World Database on Protected Areas

WHAT IS PROTECTED AREA MANAGEMENT EFFECTIVENESS?

Protected Area management effectiveness evaluation is defined as:

“The assessment of how well the protected area is being managed – primarily the extent to which it is protecting values and achieving goals and objectives” (Hockings et al., 2006, p.xiii).

Around 12% of the land of the planet is conserved within protected areas. However, relying on protected areas as a key strategy for biodiversity conservation only makes sense if there is a reasonable chance that such areas can be secured for the foreseeable future. In the face of rapid global change – in biophysical, social and governance environments – we need to be able to demonstrate that protected areas are effectively managed and delivering conservation of the ground. Where protected areas are not being managed effectively, we need to use information from such assessments to adapt and improve management systems and actions.

THE CBD MANDATE

The CBD Programme of Work on Protected Areas establishes a specific goal (4.2) and related activities relating to management effectiveness (ME) evaluations:

Goal 4.2 - To evaluate and improve the effectiveness of protected areas management

Target: By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties.

Suggested activities of the Parties

4.2.1 Develop and adopt, by 2006, appropriate methods, standards, criteria and indicators for evaluating the effectiveness of protected area management and governance, and set up a related database, taking into account the IUCN-WCPA Framework for evaluating management effectiveness, and other relevant methodologies, which should be adapted to local conditions.

4.2.2 Implement management effectiveness evaluations of at least 30 percent of each Party's protected areas by 2010 and of national protected area systems and, as appropriate, ecological networks.

4.2.3 Include information resulting from evaluation of protected areas management effectiveness in national reports under the Convention on Biological Diversity.

4.2.4 Implement key recommendations arising from site- and system-level management effectiveness evaluations, as an integral part of adaptive management strategies

GLOBAL STUDY ON PROTECTED AREAS MANAGEMENT EFFECTIVENESS

The assessment of management effectiveness in protected areas has been steadily increasing over the last decade. Many assessments have been undertaken both at site and system levels by national protected area agencies, international NGOs (such as WWF and TNC) and with the support from large funding agencies (such as the World Bank and the Global Environment Facility).

These assessments were undertaken using a variety of different tools, creating a rich source of information. However, these tools are not easily accessible in one place, and their results have not yet been widely shared or distributed among the conservation community.

A global study on protected areas has been developed to bring together all the available data on different methodologies and its applications and to understand patterns and trends in these data. So far, the study has assembled and analysed information of for over 5000 protected areas in more than 80 countries using over 40 different assessment methodologies. It is expected that this information will help strengthen management of protected areas by assembling the good work on this subject, sharing experiences and identifying common issues and challenges.

SHARING EXPERIENCES AND LESSONS LEARNED FROM PROTECTED AREAS MANAGEMENT ASSESSMENTS

While many different approaches exist for assessing management effectiveness, results are not easily accessible and have not been widely shared and distributed among the conservation community. Sharing of experiences and lessons learned makes good sense as there can be much wasted effort when organisations start from scratch in developing evaluation methodologies, overlooking the previous experiences and duplicating efforts. In this regard, UNEP-WCMC is currently developing a mechanism for making ME information collected by the Global Study available online in order to help national governments, park agencies and managers, NGOs and the conservation community share collective experience from undertaking work on protected areas management effectiveness on the ground.

HOW CAN WE MEASURE MANAGEMENT EFFECTIVENESS ACROSS A BROAD SET OF SITES?

To answer this question, UNEP-WCMC and the University of Queensland are currently working on the development of a management effectiveness index based on the indicators used by the more than 40 ME methodologies applied in the world. It is expected that the development of the ME index, which will be linked to the World Database on Protected Areas (www.unep-wcmc.org/wdpa), will allow the conservation community to track progress and trends on protected areas management over time and across regions, in order to achieve the main goal of improving and strengthening management practices on the ground.

This work has been jointly funded by the German Government and the World Wildlife Fund (WWF).

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